kubectl Cheat Sheet

This page contains a list of commonly used `kubectl` commands and flags.

Kubectl autocomplete

BASH

```
source <(kubectl completion bash) # setup autocomplete in bash into the current shell, bash
echo "source <(kubectl completion bash)" >> ~/.bashrc # add autocomplete permanently to you
```

You can also use a shorthand alias for `kubectl` that also works with completion:

```
alias k=kubectl
complete -F __start_kubectl k
```

ZSH

```
source <(kubectl completion zsh)  # setup autocomplete in zsh into the current shell
echo "[[ $commands[kubectl] ]] && source <(kubectl completion zsh)" >> ~/.zshrc # add autoc
```

Kubectl context and configuration

Set which Kubernetes cluster `kubectl` communicates with and modifies configuration information. See Authenticating Across Clusters with kubeconfig documentation for detailed config file information.

```
kubectl config view # Show Merged kubeconfig settings.

# use multiple kubeconfig files at the same time and view merged config
KUBECONFIG=~/.kube/config:~/.kube/kubconfig2

kubectl config view

# get the password for the e2e user
kubectl config view -o jsonpath='{.users[?(@.name == "e2e")].user.password}'

kubectl config view -o jsonpath='{.users[].name}'    # display the first user
kubectl config view -o jsonpath='{.users[*].name}'   # get a list of users
kubectl config get-contexts                          # display list of contexts
kubectl config current-context                       # display the current-context
kubectl config use-context my-cluster-name           # set the default context to my-cluste

# add a new user to your kubeconf that supports basic auth
kubectl config set-credentials kubeuser/foo.kubernetes.com --username=kubeuser --password=k
```

```
# permanently save the namespace for all subsequent kubectl commands in that context.
kubectl config set-context --current --namespace=ggckad-s2

# set a context utilizing a specific username and namespace.
kubectl config set-context gce --user=cluster-admin --namespace=foo \
  && kubectl config use-context gce

kubectl config unset users.foo                      # delete user foo
```

Kubectl apply

`apply` manages applications through files defining Kubernetes resources. It creates and updates resources in a cluster through running `kubectl apply`. This is the recommended way of managing Kubernetes applications on production. See Kubectl Book.

Creating objects

Kubernetes manifests can be defined in YAML or JSON. The file extension `.yaml`, `.yml`, and `.json` can be used.

```
kubectl apply -f ./my-manifest.yaml            # create resource(s)
kubectl apply -f ./my1.yaml -f ./my2.yaml      # create from multiple files
kubectl apply -f ./dir                         # create resource(s) in all manifest files i
kubectl apply -f https://git.io/vPieo          # create resource(s) from url
kubectl create deployment nginx --image=nginx  # start a single instance of nginx

# create a Job which prints "Hello World"
kubectl create job hello --image=busybox -- echo "Hello World"

# create a CronJob that prints "Hello World" every minute
kubectl create cronjob hello --image=busybox   --schedule="*/1 * * * *" -- echo "Hello Worl

kubectl explain pods                           # get the documentation for pod manifests

# Create multiple YAML objects from stdin
cat <<EOF | kubectl apply -f -
apiVersion: v1
kind: Pod
metadata:
  name: busybox-sleep
spec:
  containers:
  - name: busybox
    image: busybox
    args:
    - sleep
    - "1000000"
---
apiVersion: v1
kind: Pod
metadata:
  name: busybox-sleep-less
spec:
  containers:
  - name: busybox
    image: busybox
    args:
    - sleep
    - "1000"
EOF

# Create a secret with several keys
cat <<EOF | kubectl apply -f -
apiVersion: v1
```

```
kind: Secret
metadata:
  name: mysecret
type: Opaque
data:
  password: $(echo -n "s33msi4" | base64 -w0)
  username: $(echo -n "jane" | base64 -w0)
EOF
```

Viewing, finding resources

```
# Get commands with basic output
kubectl get services                          # List all services in the namespace
kubectl get pods --all-namespaces             # List all pods in all namespaces
kubectl get pods -o wide                      # List all pods in the current namespace, wit
kubectl get deployment my-dep                 # List a particular deployment
kubectl get pods                              # List all pods in the namespace
kubectl get pod my-pod -o yaml                # Get a pod's YAML

# Describe commands with verbose output
kubectl describe nodes my-node
kubectl describe pods my-pod

# List Services Sorted by Name
kubectl get services --sort-by=.metadata.name

# List pods Sorted by Restart Count
kubectl get pods --sort-by='.status.containerStatuses[0].restartCount'

# List PersistentVolumes sorted by capacity
kubectl get pv --sort-by=.spec.capacity.storage

# Get the version label of all pods with label app=cassandra
kubectl get pods --selector=app=cassandra -o \
  jsonpath='{.items[*].metadata.labels.version}'

# Retrieve the value of a key with dots, e.g. 'ca.crt'
kubectl get configmap myconfig \
  -o jsonpath='{.data.ca\.crt}'

# Get all worker nodes (use a selector to exclude results that have a label
# named 'node-role.kubernetes.io/master')
kubectl get node --selector='!node-role.kubernetes.io/master'

# Get all running pods in the namespace
kubectl get pods --field-selector=status.phase=Running

# Get ExternalIPs of all nodes
kubectl get nodes -o jsonpath='{.items[*].status.addresses[?(@.type=="ExternalIP")].address

# List Names of Pods that belong to Particular RC
# "jq" command useful for transformations that are too complex for jsonpath, it can be found
sel=${$(kubectl get rc my-rc --output=json | jq -j '.spec.selector | to_entries | .[] | "\(
echo $(kubectl get pods --selector=$sel --output=jsonpath={.items..metadata.name})

# Show labels for all pods (or any other Kubernetes object that supports labelling)
kubectl get pods --show-labels

# Check which nodes are ready
JSONPATH='{range .items[*]}{@.metadata.name}:{range @.status.conditions[*]}{@.type}={@.statu
 && kubectl get nodes -o jsonpath="$JSONPATH" | grep "Ready=True"

# Output decoded secrets without external tools
kubectl get secret my-secret -o go-template='{{range $k,$v := .data}}{{"### "}}{{$k}}{{"\n"
```

```
# List all Secrets currently in use by a pod
kubectl get pods -o json | jq '.items[].spec.containers[].env[]?.valueFrom.secretKeyRef.nam

# List all containerIDs of initContainer of all pods
# Helpful when cleaning up stopped containers, while avoiding removal of initContainers.
kubectl get pods --all-namespaces -o jsonpath='{range .items[*].status.initContainerStatuse

# List Events sorted by timestamp
kubectl get events --sort-by=.metadata.creationTimestamp

# Compares the current state of the cluster against the state that the cluster would be in
kubectl diff -f ./my-manifest.yaml

# Produce a period-delimited tree of all keys returned for nodes
# Helpful when locating a key within a complex nested JSON structure
kubectl get nodes -o json | jq -c 'path(..)|[.[]|tostring]|join(".")'

# Produce a period-delimited tree of all keys returned for pods, etc
kubectl get pods -o json | jq -c 'path(..)|[.[]|tostring]|join(".")'

# Produce ENV for all pods, assuming you have a default container for the pods, default nam
# Helpful when running any supported command across all pods, not just `env`
for pod in $(kubectl get po --output=jsonpath={.items..metadata.name}); do echo $pod && kub
```

Updating resources

```
kubectl set image deployment/frontend www=image:v2               # Rolling update "www" con
kubectl rollout history deployment/frontend                      # Check the history of dep
kubectl rollout undo deployment/frontend                         # Rollback to the previous
kubectl rollout undo deployment/frontend --to-revision=2         # Rollback to a specific r
kubectl rollout status -w deployment/frontend                    # Watch rolling update sta
kubectl rollout restart deployment/frontend                      # Rolling restart of the "


cat pod.json | kubectl replace -f -                              # Replace a pod based on t

# Force replace, delete and then re-create the resource. Will cause a service outage.
kubectl replace --force -f ./pod.json

# Create a service for a replicated nginx, which serves on port 80 and connects to the cont
kubectl expose rc nginx --port=80 --target-port=8000

# Update a single-container pod's image version (tag) to v4
kubectl get pod mypod -o yaml | sed 's/\(image: myimage\):.*$/\1:v4/' | kubectl replace -f

kubectl label pods my-pod new-label=awesome                      # Add a Label
kubectl annotate pods my-pod icon-url=http://goo.gl/XXBTWq       # Add an annotation
kubectl autoscale deployment foo --min=2 --max=10                # Auto scale a deployment
```

Patching resources

```
# Partially update a node
kubectl patch node k8s-node-1 -p '{"spec":{"unschedulable":true}}'

# Update a container's image; spec.containers[*].name is required because it's a merge key
kubectl patch pod valid-pod -p '{"spec":{"containers":[{"name":"kubernetes-serve-hostname",

# Update a container's image using a json patch with positional arrays
kubectl patch pod valid-pod --type='json' -p='[{"op": "replace", "path": "/spec/containers/
```

```
# Disable a deployment livenessProbe using a json patch with positional arrays
kubectl patch deployment valid-deployment  --type json   -p='[{"op": "remove", "path": "/sp

# Add a new element to a positional array
kubectl patch sa default --type='json' -p='[{"op": "add", "path": "/secrets/1", "value": {"
```

Editing resources

Edit any API resource in your preferred editor.

```
kubectl edit svc/docker-registry                      # Edit the service named docker-regis
KUBE_EDITOR="nano" kubectl edit svc/docker-registry   # Use an alternative editor
```

Scaling resources

```
kubectl scale --replicas=3 rs/foo                                 # Scale a replicaset name
kubectl scale --replicas=3 -f foo.yaml                            # Scale a resource specif
kubectl scale --current-replicas=2 --replicas=3 deployment/mysql  # If the deployment named
kubectl scale --replicas=5 rc/foo rc/bar rc/baz                   # Scale multiple replicat
```

Deleting resources

```
kubectl delete -f ./pod.json                                              # Delete a pod us
kubectl delete pod,service baz foo                                        # Delete pods and
kubectl delete pods,services -l name=myLabel                              # Delete pods and
kubectl -n my-ns delete pod,svc --all                                      # Delete all pod
# Delete all pods matching the awk pattern1 or pattern2
kubectl get pods  -n mynamespace --no-headers=true | awk '/pattern1|pattern2/{print $1}' | 
```

Interacting with running Pods

```
kubectl logs my-pod                                 # dump pod logs (stdout)
kubectl logs -l name=myLabel                        # dump pod logs, with label name=myLabe
kubectl logs my-pod --previous                      # dump pod logs (stdout) for a previous
kubectl logs my-pod -c my-container                 # dump pod container logs (stdout, mult
kubectl logs -l name=myLabel -c my-container        # dump pod logs, with label name=myLabe
kubectl logs my-pod -c my-container --previous      # dump pod container logs (stdout, mult
kubectl logs -f my-pod                              # stream pod logs (stdout)
kubectl logs -f my-pod -c my-container              # stream pod container logs (stdout, mu
kubectl logs -f -l name=myLabel --all-containers    # stream all pods logs with label name=
kubectl run -i --tty busybox --image=busybox -- sh  # Run pod as interactive shell
kubectl run nginx --image=nginx -n
mynamespace                                         # Run pod nginx in a specific namespace
kubectl run nginx --image=nginx                     # Run pod nginx and write its spec into
--dry-run=client -o yaml > pod.yaml

kubectl attach my-pod -i                            # Attach to Running Container
kubectl port-forward my-pod 5000:6000               # Listen on port 5000 on the local mach
kubectl exec my-pod -- ls /                         # Run command in existing pod (1 contai
```

```
kubectl exec --stdin --tty my-pod -- /bin/sh        # Interactive shell access to a running
kubectl exec my-pod -c my-container -- ls /         # Run command in existing pod (multi-co
kubectl top pod POD_NAME --containers               # Show metrics for a given pod and its
kubectl top pod POD_NAME --sort-by=cpu              # Show metrics for a given pod and sort
```

Interacting with Deployments and Services

```
kubectl logs deploy/my-deployment                          # dump Pod logs for a Deployment
kubectl logs deploy/my-deployment -c my-container          # dump Pod logs for a Deployment

kubectl port-forward svc/my-service 5000                   # listen on local port 5000 and f
kubectl port-forward svc/my-service 5000:my-service-port   # listen on local port 5000 and f

kubectl port-forward deploy/my-deployment 5000:6000        # listen on local port 5000 and f
kubectl exec deploy/my-deployment -- ls                    # run command in first Pod and fi
```

Interacting with Nodes and cluster

```
kubectl cordon my-node                                                # Mark my-node as uns
kubectl drain my-node                                                 # Drain my-node in pr
kubectl uncordon my-node                                              # Mark my-node as sch
kubectl top node my-node                                              # Show metrics for a
kubectl cluster-info                                                  # Display addresses o
kubectl cluster-info dump                                             # Dump current cluste
kubectl cluster-info dump --output-directory=/path/to/cluster-state   # Dump current cluste

# If a taint with that key and effect already exists, its value is replaced as specified.
kubectl taint nodes foo dedicated=special-user:NoSchedule
```

Resource types

List all supported resource types along with their shortnames, API group, whether they are namespaced, and Kind:

```
kubectl api-resources
```

Other operations for exploring API resources:

```
kubectl api-resources --namespaced=true      # All namespaced resources
kubectl api-resources --namespaced=false     # All non-namespaced resources
kubectl api-resources -o name                # All resources with simple output (only the r
kubectl api-resources -o wide                # All resources with expanded (aka "wide") out
kubectl api-resources --verbs=list,get       # All resources that support the "list" and "g
kubectl api-resources --api-group=extensions # All resources in the "extensions" API group
```

Formatting output

To output details to your terminal window in a specific format, add the `-o` (or `--output`) flag to a supported `kubectl` command.

Output format	Description
`-o=custom-columns=<spec>`	Print a table using a comma separated list of custom columns
`-o=custom-columns-file=<filename>`	Print a table using the custom columns template in the `<filename>` file
`-o=json`	Output a JSON formatted API object
`-o=jsonpath=<template>`	Print the fields defined in a jsonpath expression
`-o=jsonpath-file=<filename>`	Print the fields defined by the jsonpath expression in the `<filename>` file
`-o=name`	Print only the resource name and nothing else
`-o=wide`	Output in the plain-text format with any additional information, and for pods, the node name is included
`-o=yaml`	Output a YAML formatted API object

Examples using `-o=custom-columns`:

```
# All images running in a cluster
kubectl get pods -A -o=custom-columns='DATA:spec.containers[*].image'

# All images running in namespace: default, grouped by Pod
kubectl get pods --namespace default --output=custom-columns="NAME:.metadata.name,IMAGE:.sp

 # All images excluding "k8s.gcr.io/coredns:1.6.2"
kubectl get pods -A -o=custom-columns='DATA:spec.containers[?(@.image!="k8s.gcr.io/coredns:

# All fields under metadata regardless of name
kubectl get pods -A -o=custom-columns='DATA:metadata.*'
```

More examples in the kubectl reference documentation.

Kubectl output verbosity and debugging

Kubectl verbosity is controlled with the `-v` or `--v` flags followed by an integer representing the log level. General Kubernetes logging conventions and the associated log levels are described here.

Verbosity	Description
`--v=0`	Generally useful for this to *always* be visible to a cluster operator.
`--v=1`	A reasonable default log level if you don't want verbosity.
`--v=2`	Useful steady state information about the service and important log messages that may correlate to significant changes in the system. This is the recommended default log level for most systems.
`--v=3`	Extended information about changes.
`--v=4`	Debug level verbosity.

Verbosity	Description
`--v=5`	Trace level verbosity.
`--v=6`	Display requested resources.
`--v=7`	Display HTTP request headers.
`--v=8`	Display HTTP request contents.
`--v=9`	Display HTTP request contents without truncation of contents.

What's next

- Read the kubectl overview and learn about JsonPath.
- See kubectl options.
- Also read kubectl Usage Conventions to understand how to use kubectl in reusable scripts.
- See more community kubectl cheatsheets.

Feedback

Was this page helpful?

Yes No

Last modified April 15, 2021 at 11:28 AM PST : Update cheatsheet.md (21bf5f96b)