

[Hands-on] 07. Kubernetes Overview

기본적인 쿠버네티스 명령어들에 대해 알아보겠습니다.
제일먼저 도움말을 볼까요?

```
ubuntu@ip-10-0-1-14:~$ kubectl --help
kubectl controls the Kubernetes cluster manager.

Find more information at: https://kubernetes.io/docs/reference/kubectl/overview/

Basic Commands (Beginner):
  create      Create a resource from a file or from stdin
  expose      Take a replication controller, service, deployment or pod and expose it as a new Kubernetes service
  run         Run a particular image on the cluster
  set         Set specific features on objects

Basic Commands (Intermediate):
  explain     Get documentation for a resource
  get         Display one or many resources
  edit        Edit a resource on the server
  delete      Delete resources by file names, stdin, resources and names, or by resources and label selector
... 생략 ...
Usage:
  kubectl [flags] [options]

Use "kubectl <command> --help" for more information about a given command.
Use "kubectl options" for a list of global command-line options (applies to all commands).
```

명령어 : `kubectl --help`

여러가지 명령어들을 볼 수 있고, 사용법을 알 수 있습니다.

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몇 가지 명령어들을 알아보까요?

버전을 알아보려면,

```
ubuntu@ip-10-0-1-14:~$ kubectl version
Client Version: version.Info{Major:"1", Minor:"23", GitVersion:"v1.23.3", GitCommit:"816c97ab8cff8a1c72eccc1026f7820e93e0d25", GitTreeState:"clean", BuildDate:"2022-01-25T21:25:17Z", GoVersion:"go1.17.6", Compiler:"gc", Platform:"linux/amd64"}
Server Version: version.Info{Major:"1", Minor:"23", GitVersion:"v1.23.3", GitCommit:"816c97ab8cff8a1c72eccc1026f7820e93e0d25", GitTreeState:"clean", BuildDate:"2022-01-25T21:19:12Z", GoVersion:"go1.17.6", Compiler:"gc", Platform:"linux/amd64"}
```

명령어 : `kubectl --help`

쿠버네티스 클러스터 정보를 확인하려면,

```
ubuntu@ip-10-0-1-14:~$ kubectl cluster-info
Kubernetes control plane is running at https://192.168.49.2:8443
CoreDNS is running at https://192.168.49.2:8443/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
```

명령어 : `kubectl cluster-info`

우리 클러스터의 노드목록은 아래 명령어로 알아볼 수 있습니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl get nodes
NAME        STATUS    ROLES                  AGE     VERSION
minikube    Ready     control-plane,master   4d23h   v1.23.3
```

명령어 : `kubectl cluster-info`

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--output wide 옵션(또는, -o wide)을 주면 더 많은 정보를 보여줍니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl get nodes --output wide
NAME          STATUS    ROLES          AGE      VERSION   INTERNAL-IP   EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION   CONTAINER-RUNTIME
minikube      Ready     control-plane, 4d23h    v1.23.3   192.168.49.2   <none>        Ubuntu 20.04.2 LTS   5.15.0-1013-aws   docker://20.10.12
```

명령어 : `kubectl get nodes --output wide`

help와 유사하게 쿠버네티스 리소스들의 정의와 설명을 보려면 `kubectl explain` 명령을 사용하면 됩니다.

예를들어 POD에 대해 알아보려면 아래와 같이 실행하면 됩니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl explain pod
KIND:      Pod
VERSION:   v1

DESCRIPTION:
  Pod is a collection of containers that can run on a host. This resource is
  created by clients and scheduled onto hosts.

FIELDS:
  apiVersion    <string>
    APIVersion defines the versioned schema of this representation of an
    object. Servers should convert recognized schemas to the latest internal
    value, and may reject unrecognized values. More info:
    https://git.k8s.io/community/contributors/devel/sig-architecture/api-conventions.md#resources
  ... 생략 ...
```

명령어 : `kubectl explain pod`

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이제 우리 클러스터에 존재하는 리소스들 중 Pod에 대해 좀 더 자세히 알아보을까요?

먼저 현재 존재하는 POD 목록은 아래와 같이 조회합니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl get pods
No resources found in default namespace.
```

명령어 : `kubectl get pods`

음. 아무것도 없군요...

지금은 **default 네임스페이스**에서 조회를 한 경우입니다.

`--namespace`로 네임스페이스를 지정하지 않으면 **default 네임스페이스**를 기본으로 합니다.

다른 네임스페이스는 뭐가 있을까요?

네임스페이스를 보려면 아래 명령어를 사용하면 됩니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl get namespaces
NAME                STATUS   AGE
default             Active   4d23h
kube-node-lease     Active   4d23h
kube-public         Active   4d23h
kube-system         Active   4d23h
kubernetes-dashboard Active   4d23h
```

명령어 : `kubectl get namespaces`

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이번에는 Pod목록을 조회하는데, --all-namespaces 옵션을 추가해볼까요?

```
ubuntu@ip-10-0-1-14:~$ kubectl get pods --all-namespaces --output wide
```

NAMESPACE	NAME	READY	STATUS	RESTARTS	AGE	IP	NODE	NOMINATED NODE	READINESS GATES
kube-system	coredns-64897985d-hkjbv2	1/1	Running	5 (21m ago)	4d23h	172.17.0.2	minikube	<none>	<none>
kube-system	etcd-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-system	kube-apiserver-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-system	kube-controller-manager-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-system	kube-proxy-nhkrh	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-system	kube-scheduler-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-system	storage-provisioner	1/1	Running	11 (20m ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kubernetes-dashboard	dashboard-metrics-scraper-58549894f-7gj7g	1/1	Running	5 (10h ago)	4d23h	172.17.0.4	minikube	<none>	<none>
kubernetes-dashboard	kubernetes-dashboard-ccd587f44-9pqvf	1/1	Running	9 (20m ago)	4d23h	172.17.0.3	minikube	<none>	<none>

명령어 : `kubectl get pods --all-namespaces --output wide`

시스템이 사용하는 Pod들을 보려면 kube-system 네임스페이스를 보면 됩니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl get pods --namespace kube-system --output wide
```

NAME	READY	STATUS	RESTARTS	AGE	IP	NODE	NOMINATED NODE	READINESS GATES
coredns-64897985d-hkjbv2	1/1	Running	5 (22m ago)	4d23h	172.17.0.2	minikube	<none>	<none>
etcd-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-apiserver-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-controller-manager-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-proxy-nhkrh	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
kube-scheduler-minikube	1/1	Running	5 (10h ago)	4d23h	192.168.49.2	minikube	<none>	<none>
storage-provisioner	1/1	Running	11 (21m ago)	4d23h	192.168.49.2	minikube	<none>	<none>

명령어 : `kubectl get pods --namespace kube-system --output wide`

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그 중에 하나, kube-scheduler를 좀 더 자세히 볼까요?
정보를 yaml형태로 볼 수 도 있구요.

```
ubuntu@ip-10-0-1-14:~$ kubectl get pod kube-scheduler-minikube --namespace kube-system --output yaml
apiVersion: v1
kind: Pod
metadata:
  annotations:
    kubernetes.io/config.hash: be132fe5c6572cb34d93f5e05ce2a540
    kubernetes.io/config.mirror: be132fe5c6572cb34d93f5e05ce2a540
    kubernetes.io/config.seen: "2022-06-28T03:00:51.759906088Z"
    kubernetes.io/config.source: file
    seccomp.security.alpha.kubernetes.io/pod: runtime/default
  creationTimestamp: "2022-06-28T03:00:59Z"
  labels:
    component: kube-scheduler
    tier: control-plane
  name: kube-scheduler-minikube
  namespace: kube-system
  ownerReferences:
  - apiVersion: v1
    controller: true
    kind: Node
    name: minikube
    uid: 62972b18-7ace-41ed-8101-1e799dc7039b
  resourceVersion: "107807"
  uid: 496eb351-e550-47d7-b681-1c1a4db07ee2
... 생략 ...
```

명령어 : `kubectl get pod kube-scheduler-minikube --namespace kube-system --output yaml`

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describe 명령으로 자세한 정보를 조회할 수도 있습니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl describe pod kube-scheduler-minikube --namespace kube-system
Name:                kube-scheduler-minikube
Namespace:           kube-system
Priority:             2000001000
Priority Class Name:  system-node-critical
Node:                minikube/192.168.49.2
Start Time:          Sun, 03 Jul 2022 02:26:05 +0000
Labels:              component=kube-scheduler
                    tier=control-plane
Annotations:         kubernetes.io/config.hash: be132fe5c6572cb34d93f5e05ce2a540
                    kubernetes.io/config.mirror: be132fe5c6572cb34d93f5e05ce2a540
                    kubernetes.io/config.seen: 2022-06-28T03:00:51.759906088Z
                    kubernetes.io/config.source: file
                    seccomp.security.alpha.kubernetes.io/pod: runtime/default
Status:              Running
IP:                  192.168.49.2
IPs:
  IP:                192.168.49.2
Controlled By:       Node/minikube
Containers:
  kube-scheduler:
    Container ID:  docker://611f03eee9bda2543f503017e1e6a93ac784eefc22bfb6a86a6407a54fdc0e13
    Image:         k8s.gcr.io/kube-scheduler:v1.23.3
    Image ID:      docker-pullable://k8s.gcr.io/kube-scheduler@sha256:32308abe86f7415611ca86ee79dd0a73e74ebeb2f9e3eb85fc3a8e62f03d0e7
    Port:          <none>
    Host Port:     <none>
    ... 생략 ...
```

명령어 : `kubectl describe pod kube-scheduler-minikube --namespace kube-system`

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Pod의 로그를 보려면 아래와 같이 하시면 됩니다.

```
ubuntu@ip-10-0-1-14:~$ kubectl logs -n kube-system kube-scheduler-minikube
I0703 02:26:09.300292    1 serving.go:348] Generated self-signed cert in-memory
W0703 02:26:09.824641    1 authentication.go:345] Error looking up in-cluster authentication configuration: Get "https://192.168.49.2:8443/api/v1/namespaces/kube-system/configmaps/extension-apiserver-authentication": dial tcp 192.168.49.2:8443: connect: connection refused
W0703 02:26:09.824698    1 authentication.go:346] Continuing without authentication configuration. This may treat all requests as anonymous.
W0703 02:26:09.824710    1 authentication.go:347] To require authentication configuration lookup to succeed, set --authentication-tolerate-lookup-failure=false
I0703 02:26:09.920711    1 server.go:139] "Starting Kubernetes Scheduler" version="v1.23.3"
I0703 02:26:09.941545    1 configmap_cafile_content.go:201] "Starting controller" name="client-ca::kube-system::extension-apiserver-authentication::client-ca-file"
I0703 02:26:09.941603    1 secure_serving.go:200] Serving securely on 127.0.0.1:10259
I0703 02:26:09.941631    1 tlsconfig.go:240] "Starting DynamicServingCertificateController"
I0703 02:26:09.952426    1 shared_informer.go:240] Waiting for caches to sync for client-ca::kube-system::extension-apiserver-authentication::client-ca-file

... 생략 ...
```

명령어 : `kubectl logs -n kube-system kube-scheduler-minikube`

여기까지, 기본적인 kubectl 명령어들을 알아보았습니다. 더 많은 내용은 차차 알아보게요~ ٩(ˊᵀˋ*)و