Managing Kubernetes

2021-04-23
written by whatwant

Agenda

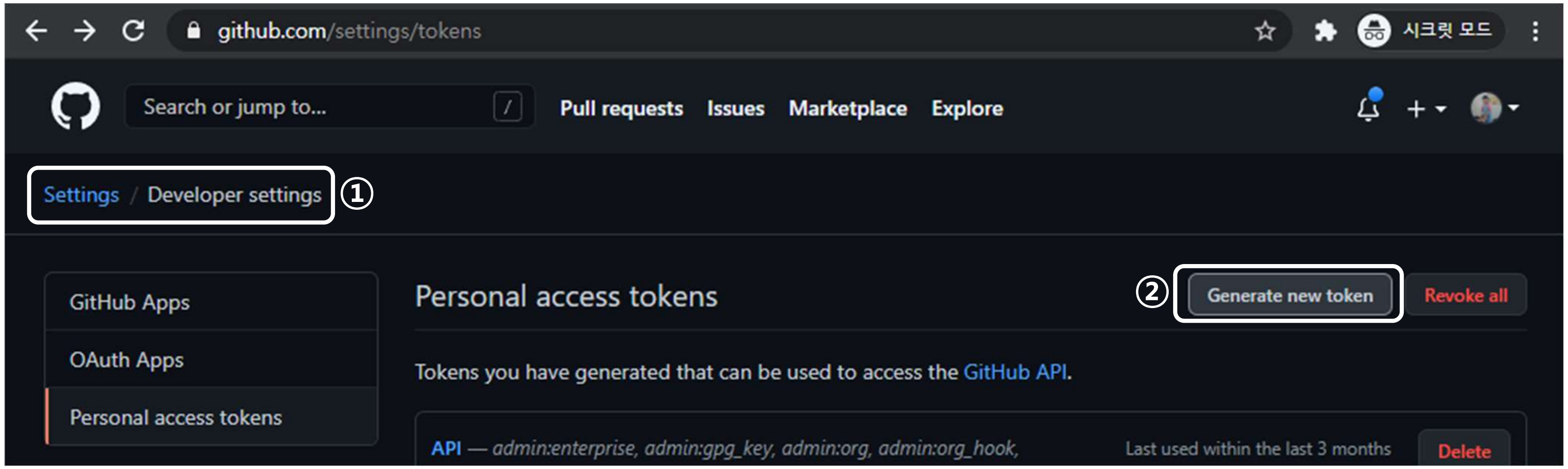
※ 참고 : https://home.modulabs.co.kr/product/managing-kubernetes/

2 week
Environment & POD

Homework

Container Registry in GitHub – 1/5

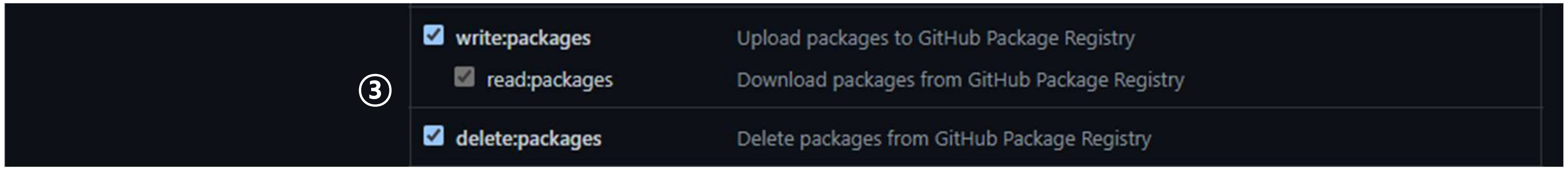
- GitHub Registry Server에 image를 업로드 하기 위해서, access token을 발급받자
- 권한은 'packages' 관련된 것들만 있으면 된다.



Personal access tokens

Tokens you have generated that can be used to access the GitHub API.

API — *admin:enterprise, admin:gpg_key, admin:org, admin:org_hook,* Last used within the last 3 months

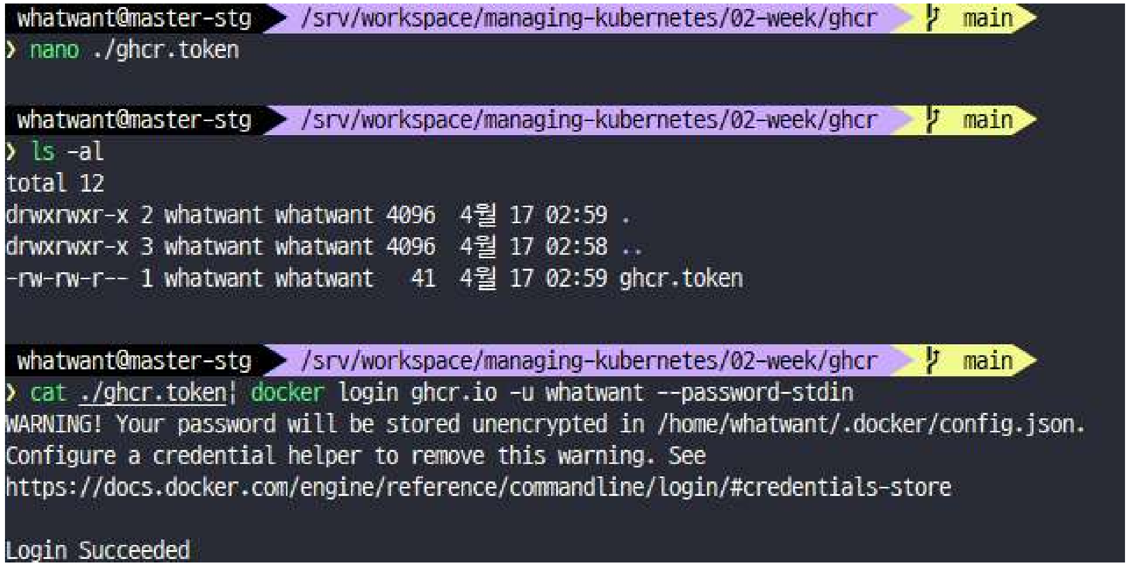


✓ write:packages	Upload packages to GitHub Package Registry
✓ read:packages	Download packages from GitHub Package Registry
✓ delete:packages	Delete packages from GitHub Package Registry

※ 참고 : https://docs.github.com/en/packages/guides/about-github-container-registry

Container Registry in GitHub – 2/5

- 발급 받은 token을 text로 저장 (반드시 이렇게 할 필요는 없지만, 사용 편의를 위해서…)
- GitHub Container Registry(ghcr.io)에 로그인



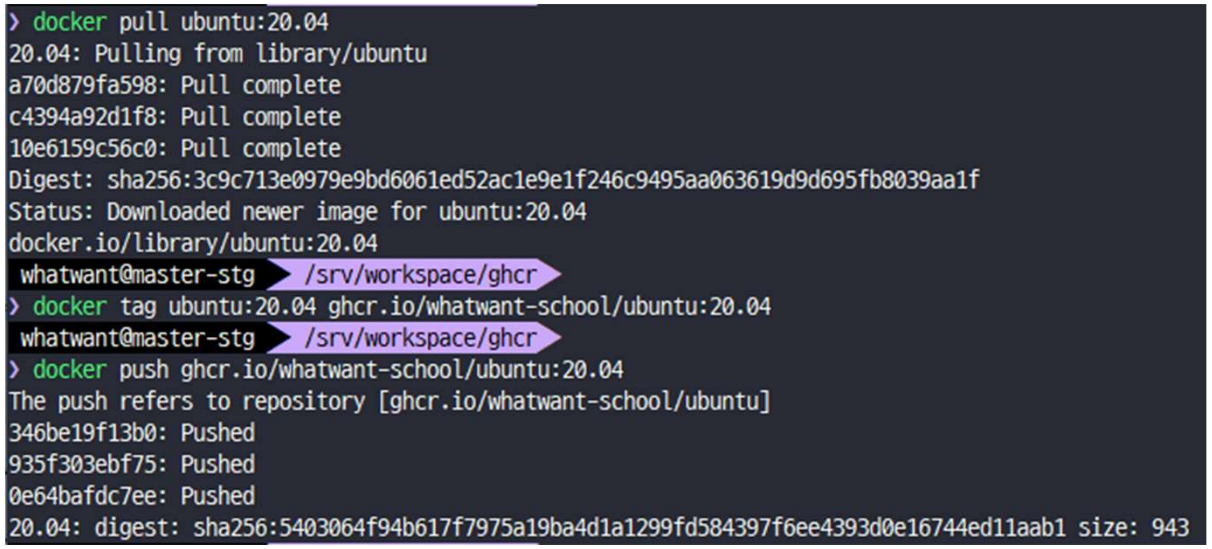
```
whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/ghcr  main
❯ nano ./ghcr.token

whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/ghcr  main
❯ ls -al
total 12
drwxrwxr-x 2 whatwant whatwant 4096  4월 17 02:59 .
drwxrwxr-x 3 whatwant whatwant 4096  4월 17 02:58 ..
-rw-rw-r-- 1 whatwant whatwant   41  4월 17 02:59 ghcr.token

whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/ghcr  main
❯ cat ./ghcr.token| docker login ghcr.io -u whatwant --password-stdin
WARNING! Your password will be stored unencrypted in /home/whatwant/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

```
> cat ./ghcr.token | docker login ghcr.io -u <USERNAME> --password-stdin
```

※ 참고 : https://www.44bits.io/ko/post/news--github-container-registry-beta-release

Container Registry in GitHub – 3/5

- 이미지 확보 → tagging → push
- 사용자 계정 또는 organization 기준으로 package upload



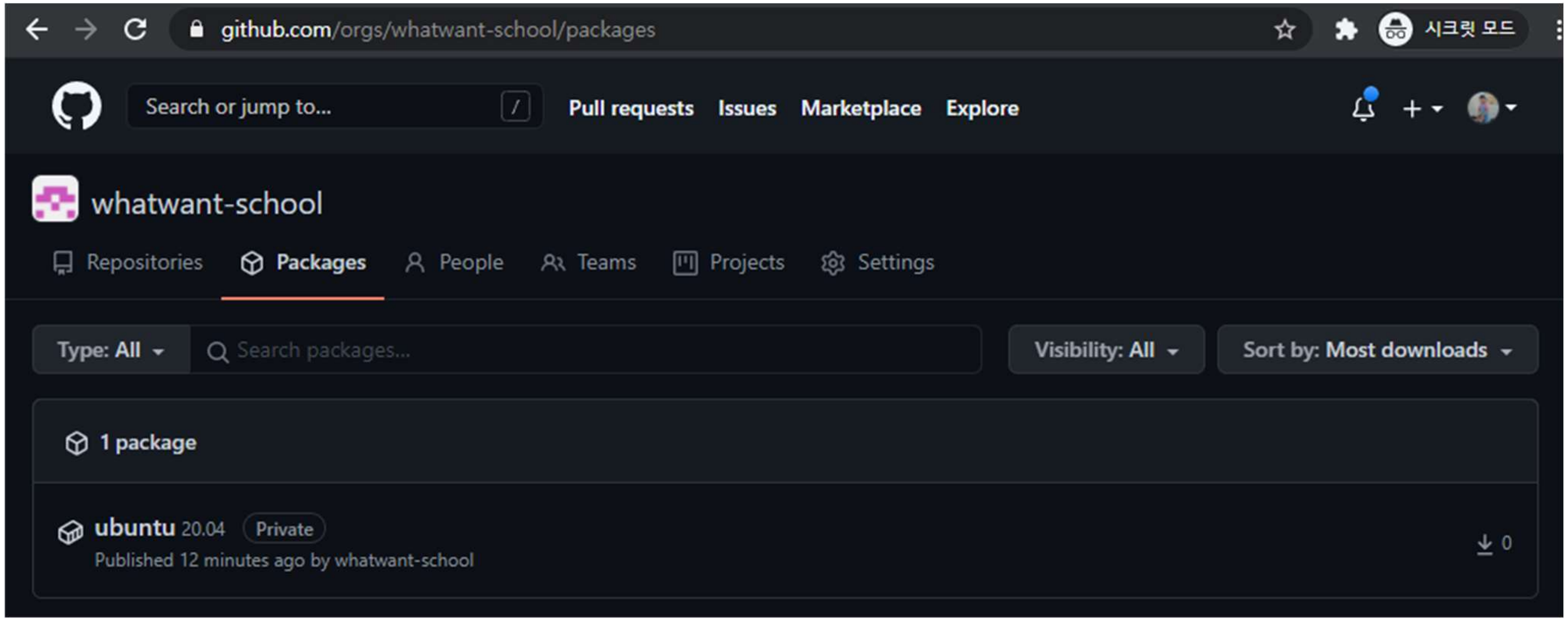
```
❯ docker pull ubuntu:20.04
20.04: Pulling from library/ubuntu
a70d879fa598: Pull complete
c4394a92d1f8: Pull complete
10e6159c56c0: Pull complete
Digest: sha256:3c9c713e0979e9bd6061ed52ac1e9e1f246c9495aa063619d9d695fb8039aa1f
Status: Downloaded newer image for ubuntu:20.04
docker.io/library/ubuntu:20.04
 whatwant@master-stg  /srv/workspace/ghcr
❯ docker tag ubuntu:20.04 ghcr.io/whatwant-school/ubuntu:20.04
 whatwant@master-stg  /srv/workspace/ghcr
❯ docker push ghcr.io/whatwant-school/ubuntu:20.04
The push refers to repository [ghcr.io/whatwant-school/ubuntu]
346be19f13b0: Pushed
935f303ebf75: Pushed
0e64bafdc7ee: Pushed
20.04: digest: sha256:5403064f94b617f7975a19ba4d1a1299fd584397f6ee4393d0e16744ed11aab1 size: 943
```

```
> docker tag ubuntu:20.04 ghcr.io/<user | org>/<image name:tag>
> docker push ghcr.io/<user | org>/<image name:tag>
```

※ 참고 : https://www.44bits.io/ko/post/news--github-container-registry-beta-release

Container Registry in GitHub – 4/5

- user/organization 메뉴를 보면 `Packages` 확인 가능



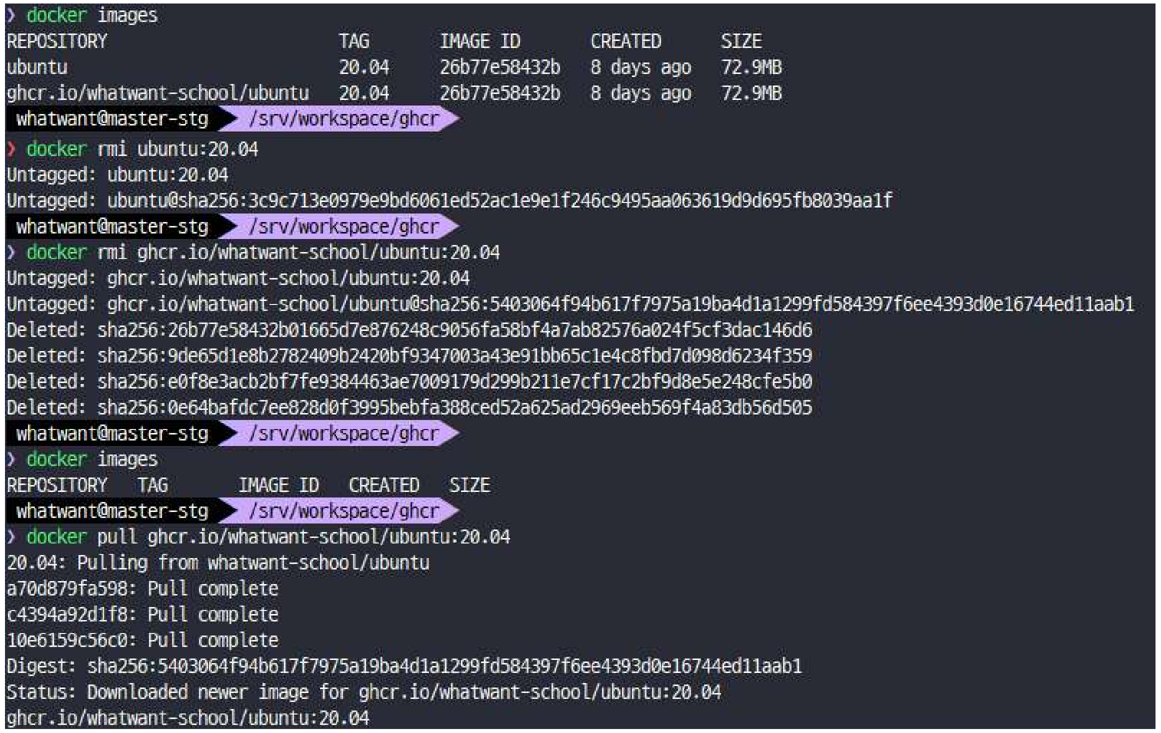
1 package

ubuntu 20.04 Private
Published 12 minutes ago by whatwant-school
0

※ 참고 : https://www.44bits.io/ko/post/news--github-container-registry-beta-release

Container Registry in GitHub – 5/5

- `docker pull` 해보기
- local에 있는 image 삭제하고 ghcr.io에서 내려 받기



```
❯ docker images
REPOSITORY                     TAG       IMAGE ID       CREATED      SIZE
ubuntu                         20.04     26b77e58432b   8 days ago   72.9MB
ghcr.io/whatwant-school/ubuntu 20.04     26b77e58432b   8 days ago   72.9MB
 whatwant@master-stg  /srv/workspace/ghcr
❯ docker rmi ubuntu:20.04
Untagged: ubuntu:20.04
Untagged: ubuntu@sha256:3c9c713e0979e9bd6061ed52ac1e9e1f246c9495aa063619d9d695fb8039aa1f
 whatwant@master-stg  /srv/workspace/ghcr
❯ docker rmi ghcr.io/whatwant-school/ubuntu:20.04
Untagged: ghcr.io/whatwant-school/ubuntu:20.04
Untagged: ghcr.io/whatwant-school/ubuntu@sha256:5403064f94b617f7975a19ba4d1a1299fd584397f6ee4393d0e16744ed11aab1
Deleted: sha256:26b77e58432b01665d7e876248c9056fa58bf4a7ab82576a024f5cf3dac146d6
Deleted: sha256:9de65d1e8b2782409b2420bf9347003a43e91bb65c1e4c8fbd7d098d6234f359
Deleted: sha256:e0f8e3acb2bf7fe9384463ae7009179d299b211e7cf17c2bf9d8e5e248cfe5b0
Deleted: sha256:0e64bafdc7ee828d0f3995bebfa388ced52a625ad2969eeb569f4a83db56d505
 whatwant@master-stg  /srv/workspace/ghcr
❯ docker images
REPOSITORY   TAG       IMAGE ID   CREATED   SIZE
 whatwant@master-stg  /srv/workspace/ghcr
❯ docker pull ghcr.io/whatwant-school/ubuntu:20.04
20.04: Pulling from whatwant-school/ubuntu
a70d879fa598: Pull complete
c4394a92d1f8: Pull complete
10e6159c56c0: Pull complete
Digest: sha256:5403064f94b617f7975a19ba4d1a1299fd584397f6ee4393d0e16744ed11aab1
Status: Downloaded newer image for ghcr.io/whatwant-school/ubuntu:20.04
ghcr.io/whatwant-school/ubuntu:20.04
```

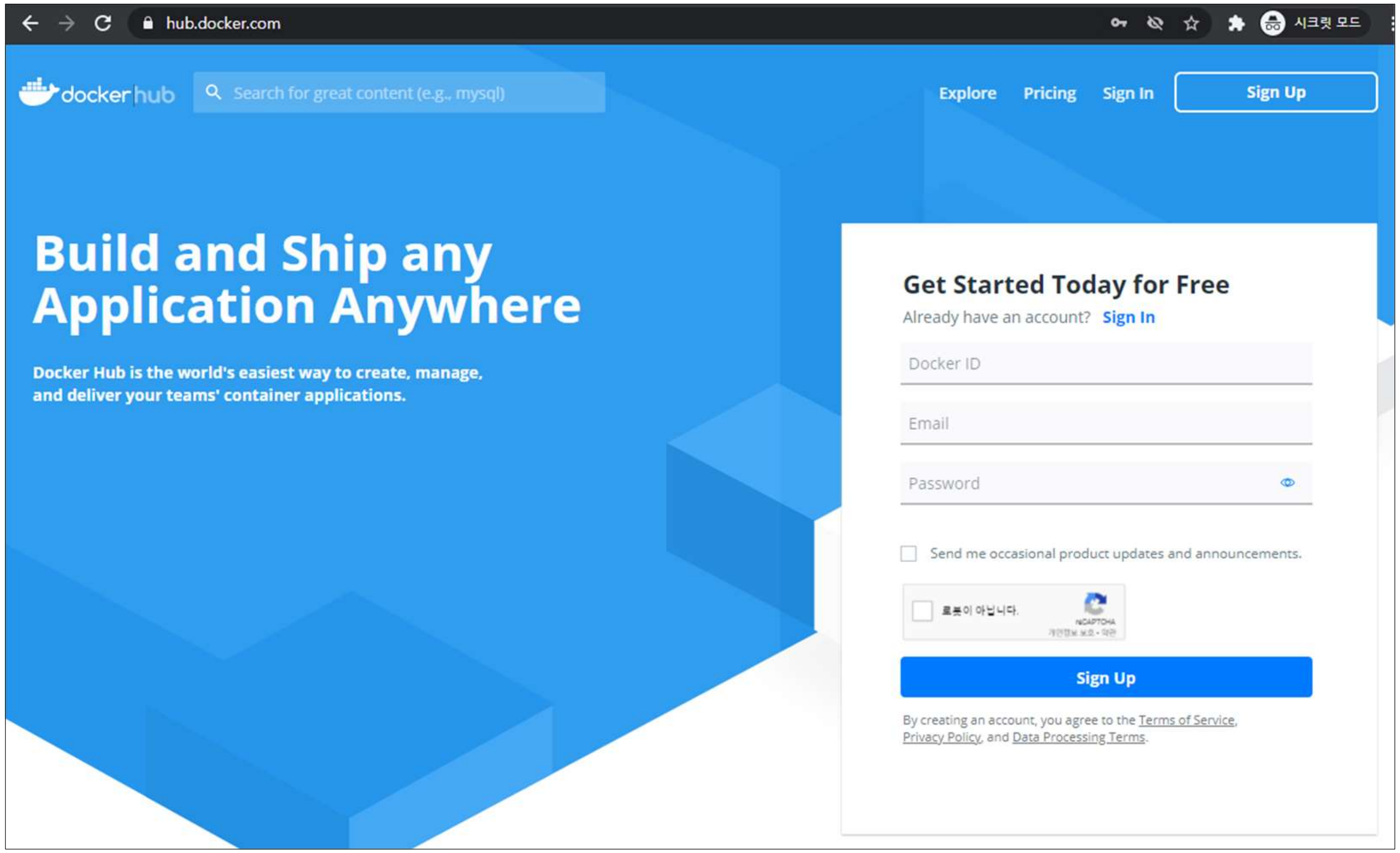
```
> docker rmi ghcr.io/<user | org>/<image name:tag>
> docker pull ghcr.io/<user | org>/<image name:tag>
```

Supplementary Lessons

Docker Hub – 1/6

- `docker hub`에 image를 업로드하기 위해서는 일단 사이트에 가입 필수

  . https://hub.docker.com/



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Password

Send me occasional product updates and announcements.

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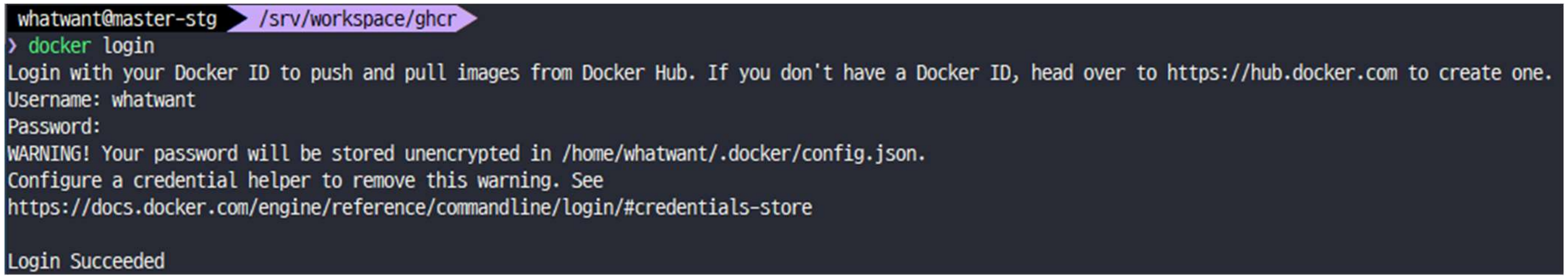
Docker Hub – 2/6

- 업로드를 위한 권한을 얻기 위해서는 `docker login` 필요



```
whatwant@master-stg  /srv/workspace/ghcr
❯ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: whatwant
Password:
WARNING! Your password will be stored unencrypted in /home/whatwant/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

```
> docker login
```

Docker Hub – 3/6

- 업로드 할 image를 하나 만들자

  . 파일 2개 만들고 build 까지 해보자

index.html

```
<!doctype html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <title>WHATWANT</title>
</head>
<body>
  <h2>Hello</h2>
  <h4>This is WHATWANT SCHOOL</h4>
</body>
</html>
```

Dockerfile-whatwant

※ `Dockerfile`이 아닌 이름으로 저장된 경우에 대해서도 보여주기 위해 파일 이름을 이렇게 작성해보았다.

```
FROM nginx:latest
COPY ./index.html  /usr/share/nginx/html/index.html
```

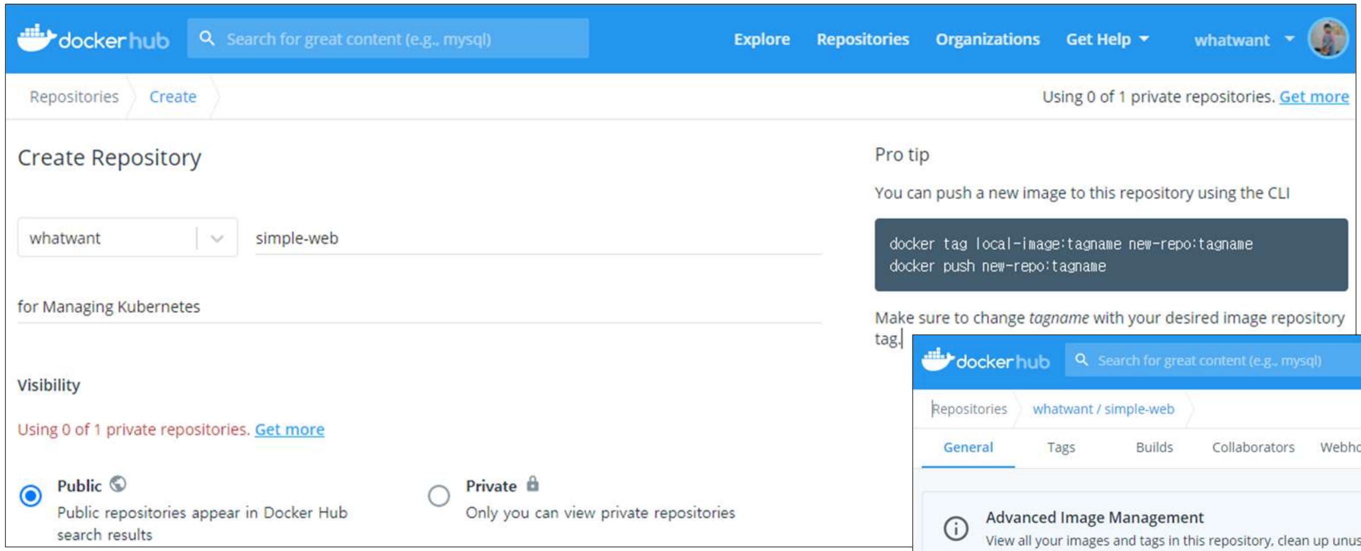
```
> docker build -t simple-web -f Dockerfile-whatwant .
```

※ 항상 제일 뒤의 `.`을 주의해야 한다.

Docker Hub – 4/6

- image를 업로드 할 Docker Hub Repository를 생성하자

. image 이름으로 생성해주면 된다 (선택 사항)



Using 0 of 1 private repositories. Get more

Create Repository

whatwant / simple-web

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Visibility

Using 0 of 1 private repositories. Get more

[✓ Public] Public repositories appear in Docker Hub search results

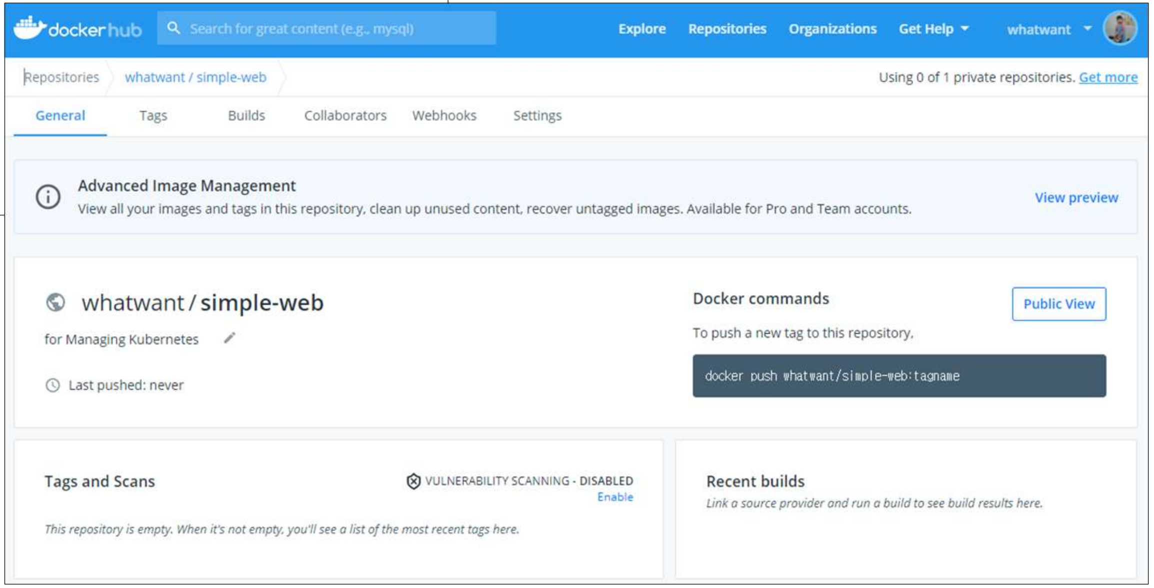
Private: Only you can view private repositories

Pro tip

You can push a new image to this repository using the CLI

```
docker tag local-image:tagname new-repo:tagname
docker push new-repo:tagname
```

Make sure to change *tagname* with your desired image repository tag.



Using 0 of 1 private repositories. Get more

Advanced Image Management

View all your images and tags in this repository, clean up unused content, recover untagged images. Available for Pro and Team accounts.

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Last pushed: never

Docker commands

To push a new tag to this repository,

```
docker push whatwant/simple-web:tagname
```

Tags and Scans

VULNERABILITY SCANNING - DISABLED

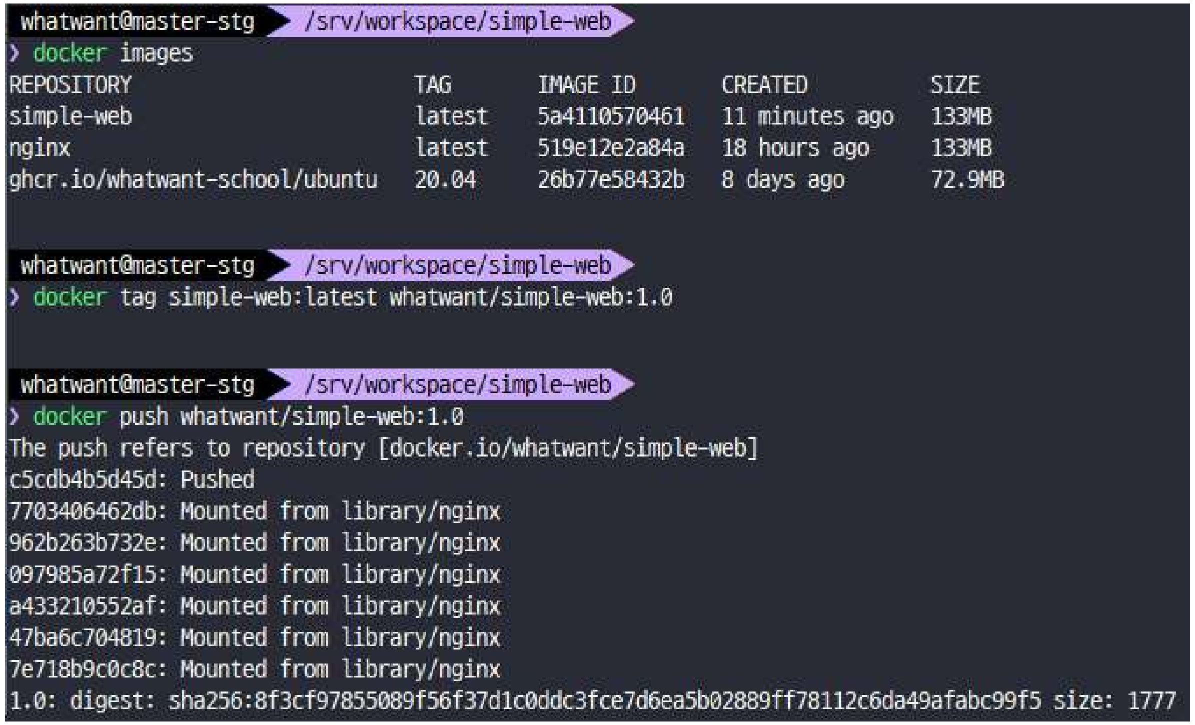
This repository is empty. When it's not empty, you'll see a list of the most recent tags here.

Recent builds

Link a source provider and run a build to see build results here.

Docker Hub – 5/6

- 업로드 하기 위한 tagging 작업 후 push 하자.

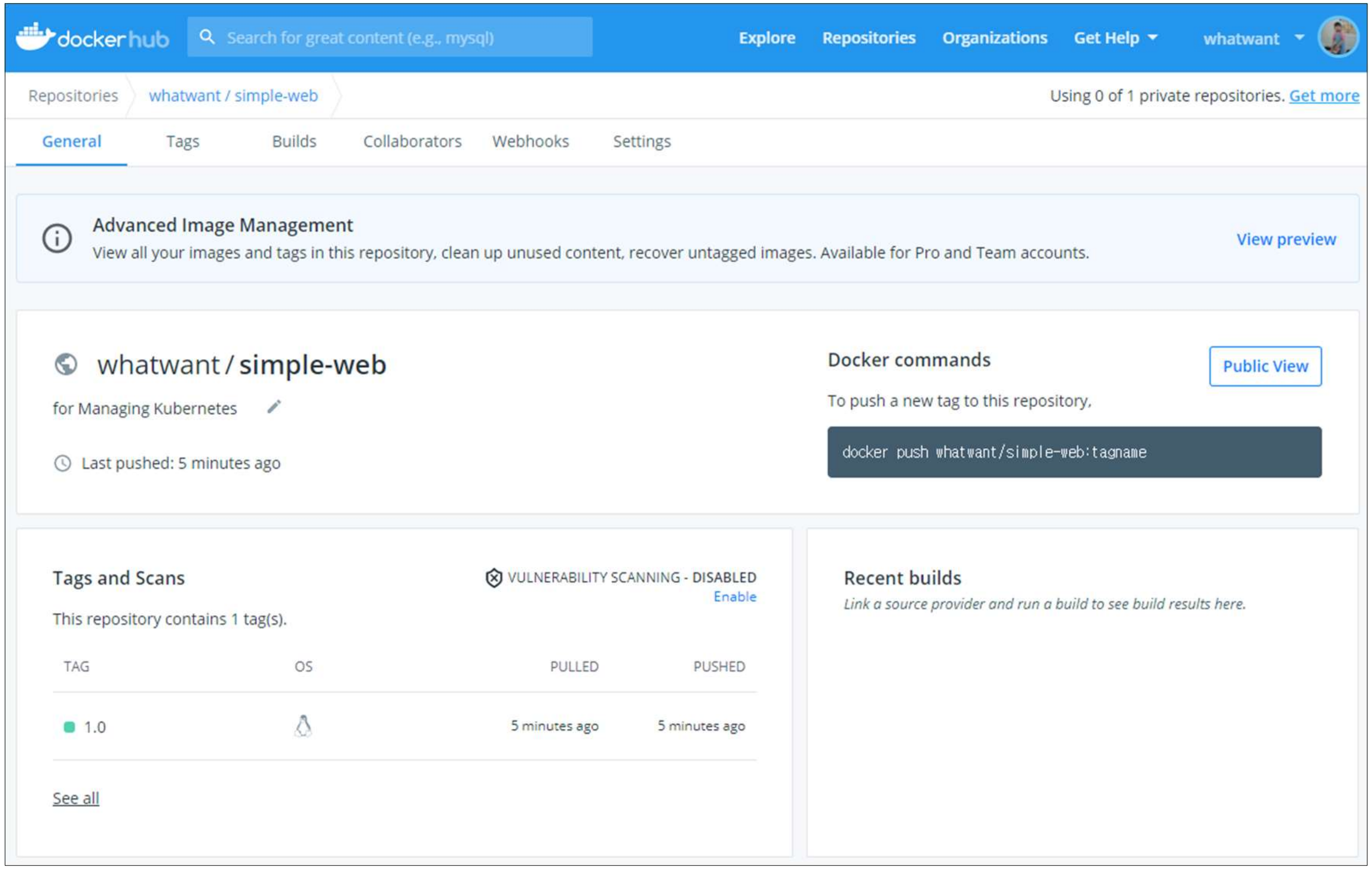


```
whatwant@master-stg  /srv/workspace/simple-web
❯ docker images
REPOSITORY                        TAG       IMAGE ID       CREATED          SIZE
simple-web                        latest    5a4110570461   11 minutes ago   133MB
nginx                             latest    519e12e2a84a   18 hours ago     133MB
ghcr.io/whatwant-school/ubuntu    20.04     26b77e58432b   8 days ago       72.9MB

whatwant@master-stg  /srv/workspace/simple-web
❯ docker tag simple-web:latest whatwant/simple-web:1.0

whatwant@master-stg  /srv/workspace/simple-web
❯ docker push whatwant/simple-web:1.0
The push refers to repository [docker.io/whatwant/simple-web]
c5cdb4b5d45d: Pushed
7703406462db: Mounted from library/nginx
962b263b732e: Mounted from library/nginx
097985a72f15: Mounted from library/nginx
a433210552af: Mounted from library/nginx
47ba6c704819: Mounted from library/nginx
7e718b9c0c8c: Mounted from library/nginx
1.0: digest: sha256:8f3cf97855089f56f37d1c0ddc3fce7d6ea5b02889ff78112c6da49afabc99f5 size: 1777
```

```
> docker tag <local-image>:<tagname>  <hub-image>:<tagname>
> docker push <hub-image>:<tagname>
```

Docker Hub – 6/6

- 업로드 된 image 확인



Advanced Image Management

View all your images and tags in this repository, clean up unused content, recover untagged images. Available for Pro and Team accounts.

whatwant / simple-web

for Managing Kubernetes

Last pushed: 5 minutes ago

Docker commands

To push a new tag to this repository,

```
docker push whatwant/simple-web:tagname
```

Tags and Scans

VULNERABILITY SCANNING - DISABLED

This repository contains 1 tag(s).

TAG	OS	PULLED	PUSHED
🟩 1.0	🐧	5 minutes ago	5 minutes ago

Recent builds

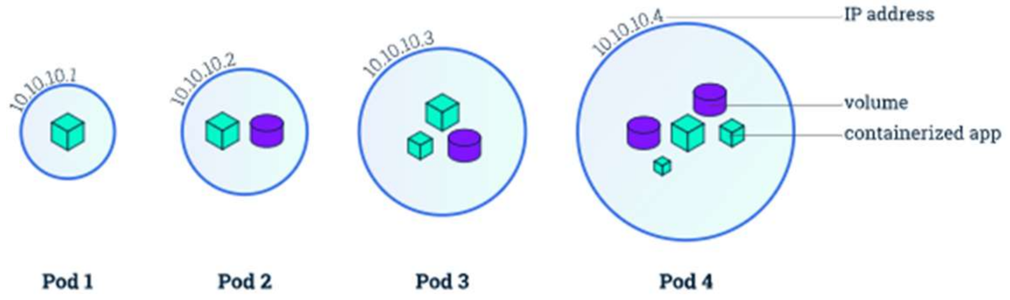
Link a source provider and run a build to see build results here.

Kubernetes – Pod

Pod is …

Pod는 Kubernetes에서 생성하고 관리할 수 있는 **배포 가능한 가장 작은 컴퓨팅 단위**이다.

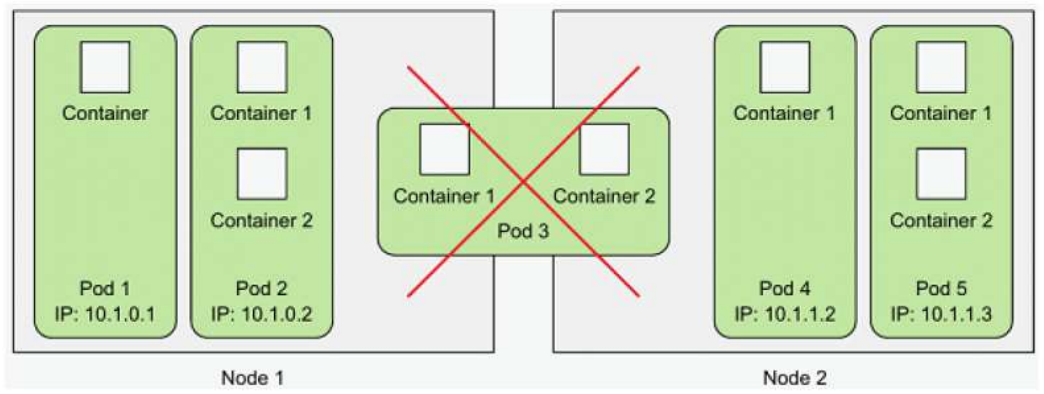
Pod는 **하나 이상의 컨테이너 그룹**이다.



※ 참고 : https://kubernetes.io/ko/docs/tutorials/kubernetes-basics/explore/explore-intro/

Pod is …

- Pod는 함께 배치된 Container 그룹을 의미
- Container는 단일 프로세스를 실행하는 것을 목적으로 설계
- 따라서, 여러 Container를 묶고 하나의 단위로 관리할 수 있는 상위 구조가 필요 → Pod
- Kubernetes는 Pod 단위로 배포하고 운영



▲ 그림 3.1 파드 안에 있는 모든 컨테이너는 같은 노드에서 실행된다. 절대로 두 노드에 걸쳐 배포되지 않는다.

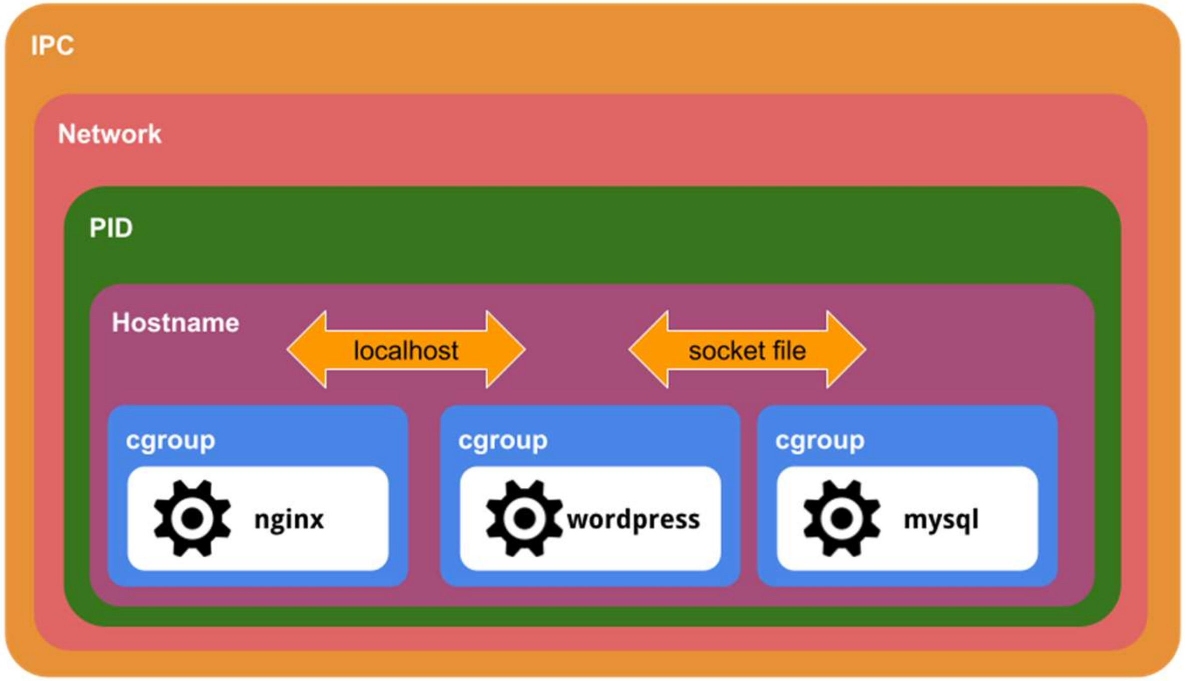
※ 참고 : https://livebook.manning.com/book/kubernetes-in-action/chapter-3/10

Pod is …

Pod 1개 안에서 여러 개의 Container가 실행되는 것은 단순하게 각 프로세스가 동일한 머신 위에서 실행한다고 생각하면 된다.

이들 프로세스는 localhost(127.0.0.1)로 네트워크 통신을 할 수 있으며, 볼륨에 있는 파일을 공유 할 수 있다.

또는 IPC(Inter Process Communication)를 이용하거나 HUP, TERM 시그널을 보낼 수도 있다.

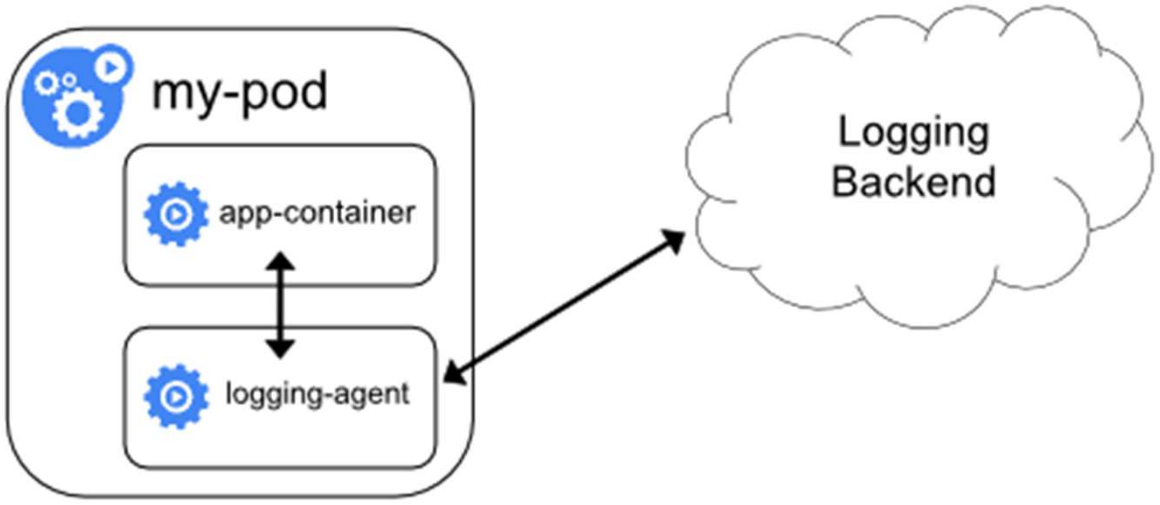


※ 참고 : https://www.joinc.co.kr/w/man/12/kubernetes/Pod

Sidecar pattern

사이드카 패턴(Sidecar Pattern)

- 기본 컨테이너의 기능을 확장하거나 강화하는 용도의 컨테이너를 추가하는 패턴
- 기본 컨테이너에는 원래 목적의 기능에만 충실하고 나머지 부가적인 공통 기능들은 사이드카 컨테이너를 추가해서 사용



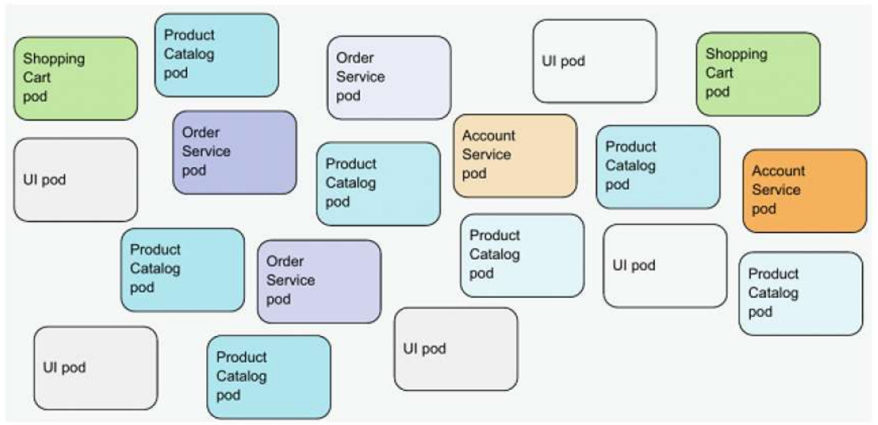
※ 참고 : https://arisu1000.tistory.com/27863

label

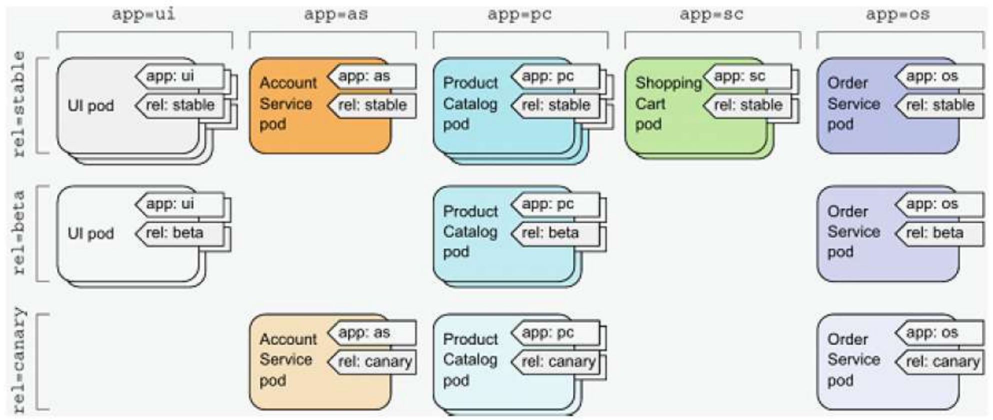
- Label은 Kubernetes 리소스를 분류할 수 있는 기능

- 각 오브젝트는 하나 이상의 레이블을 가질 수 있으며 label은 Key-Value Pair로 이루어짐

- Kubernetes 명령어에서 동일한 label을 가진 오브젝트를 선택할 수 있음



▲ 그림 3.6 마이크로서비스 아키텍처 안에 있는 분류되지 않는 파드



▲ 그림 3.7. 파드 레이블을 이용해 마이크로서비스 아키텍처 안에 파드를 조직화했다.

※ 참고 : https://livebook.manning.com/book/kubernetes-in-action/chapter-3/176

Kubernetes - Pod 실습

Create Image

- Pod 실습을 위한 image 하나 만들어서 Docker Hub에 업로드 해보자

※ 이 부분은 k8s 없이, docker만 설치되어 있는 곳이면 어디서든 가능하다.　※ 그냥 이미 올려놓은 것을 사용할 것이라면 생략 가능하다.

app.js

```
const http = require('http');
const os = require('os');

console.log("node-web server starting...");

var handler = function(request, response) {
  console.log("Received request from " + request.connection.remoteAddress);
  response.writeHead(200);
  response.end("You've hit " + os.hostname() + "₩n");
};

var www = http.createServer(handler);
www.listen(8080);
```

Dockerfile

```
FROM node:latest
ADD app.js /app.js
ENTRYPOINT ["node", "app.js"]
```

```
> docker build -t node-web:1.0 .
> docker tag node-web:1.0 <user-id>/node-web:1.0
> docker push <user-id>/node-web:1.0
```

※ Docker Hub에 Repository 미리 만드는 것 잊지 말자!

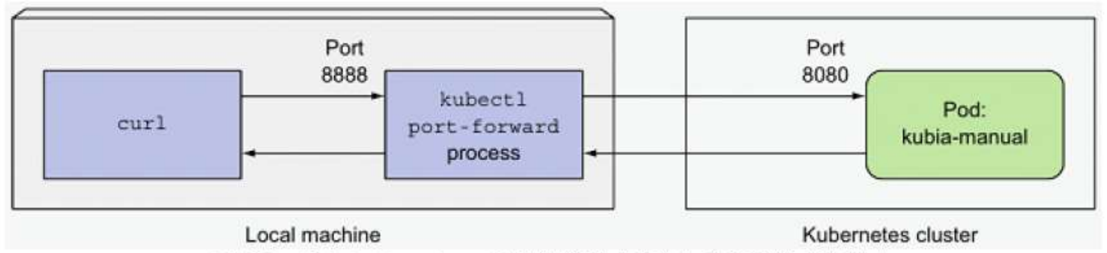
※ `docker login`도 미리 해놓는 것 잊지 말자!

※ 참고 : https://github.com/luksa/kubernetes-in-action/tree/master/Chapter02/kubia

Create Pod

node-web.yaml

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: node-web
  labels:
    creation_method: manual
    env: stage
spec:
  containers:
  - image: whatwant/node-web:1.0
    name: node-web
    ports:
    - containerPort: 8080
      protocol: TCP
```



▲ 그림 3.5 curl을 kubectl port-forward와 함께 사용할 때 일어나는 일을 간략하게 설명한다.

```
> kubectl create -f node-web.yaml
> kubectl get pods
> kubectl port-forward node-web 8080:8080 &
> curl http://localhost:8080
```

※ Pod에 접근할 수 있도록...

※ 참고 : https://livebook.manning.com/book/kubernetes-in-action/chapter-3/10

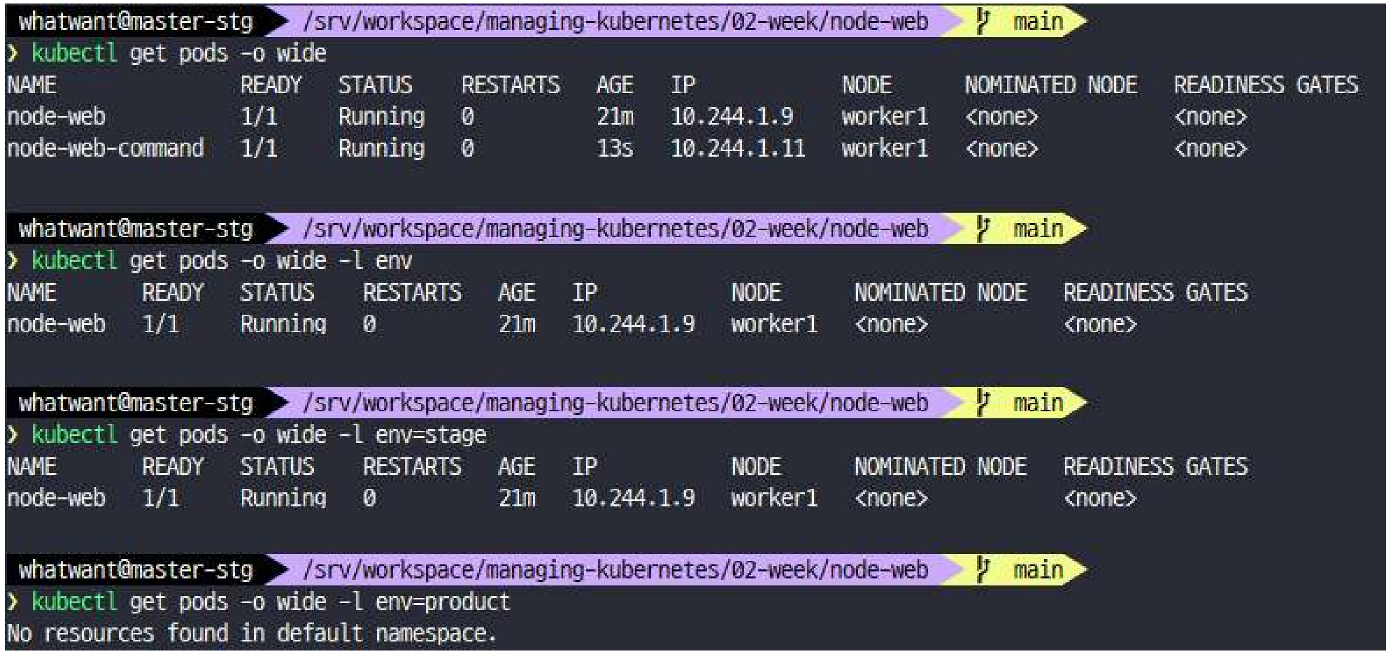
Create Pod (kubectl run)

```
> kubectl run node-web-command --image whatwant/node-web:1.0 --port=8080
```

```
> kubectl get pod node-web-command -o yaml
```

get Pods (kubectl get pods)

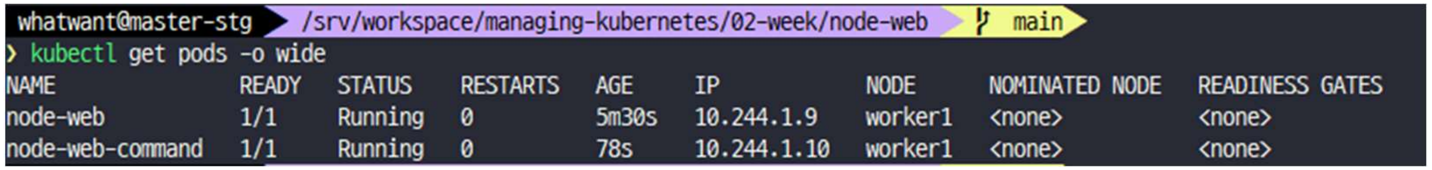
```
> kubectl get pods
> kubectl get pods -o wide
> kubectl get pods -l <label>
> kubectl get pods -l <label-key>=<label-value>
```



```
whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/node-web  main
> kubectl get pods -o wide
NAME               READY   STATUS    RESTARTS   AGE   IP            NODE      NOMINATED NODE   READINESS GATES
node-web           1/1     Running   0          21m   10.244.1.9    worker1   <none>           <none>
node-web-command   1/1     Running   0          13s   10.244.1.11   worker1   <none>           <none>

whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/node-web  main
> kubectl get pods -o wide -l env
NAME       READY   STATUS    RESTARTS   AGE   IP           NODE      NOMINATED NODE   READINESS GATES
node-web   1/1     Running   0          21m   10.244.1.9   worker1   <none>           <none>

whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/node-web  main
> kubectl get pods -o wide -l env=stage
NAME       READY   STATUS    RESTARTS   AGE   IP           NODE      NOMINATED NODE   READINESS GATES
node-web   1/1     Running   0          21m   10.244.1.9   worker1   <none>           <none>

whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/node-web  main
> kubectl get pods -o wide -l env=product
No resources found in default namespace.
```

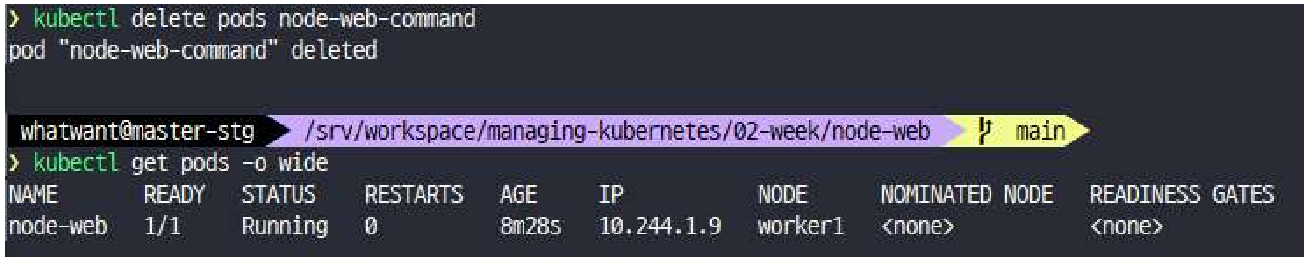
Delete Pod (kubectl delete)

```
> kubectl get pods -o wide
```



```
whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/node-web   main
❯ kubectl get pods -o wide
NAME               READY   STATUS    RESTARTS   AGE     IP            NODE      NOMINATED NODE   READINESS GATES
node-web           1/1     Running   0          5m30s   10.244.1.9    worker1   <none>           <none>
node-web-command   1/1     Running   0          78s     10.244.1.10   worker1   <none>           <none>
```

```
> kubectl delete pods node-web-command
> kubectl get pods -o wide
```



```
❯ kubectl delete pods node-web-command
pod "node-web-command" deleted

whatwant@master-stg  /srv/workspace/managing-kubernetes/02-week/node-web   main
❯ kubectl get pods -o wide
NAME       READY   STATUS    RESTARTS   AGE     IP           NODE      NOMINATED NODE   READINESS GATES
node-web   1/1     Running   0          8m28s   10.244.1.9   worker1   <none>           <none>
```

namespace

```
> kubectl get namespaces
```

```
NAME              STATUS   AGE
default           Active   22m
kube-node-lease   Active   22m
kube-public       Active   22m
kube-system       Active   22m
```

```
> kubectl get po --namespace kube-system
```

```
NAME                                      READY   STATUS             RESTARTS   AGE
coredns-66bff467f8-462lt                  1/1     Running            0          18m
coredns-66bff467f8-gvs5f                  1/1     Running            0          18m
etcd-controlplane                         1/1     Running            0          18m
katacoda-cloud-provider-58f89f7d9-s5z9z   0/1     CrashLoopBackOff   7          18m
kube-apiserver-controlplane               1/1     Running            0          18m
kube-controller-manager-controlplane      1/1     Running            0          18m
kube-flannel-ds-amd64-cdjf8               1/1     Running            0          18m
kube-flannel-ds-amd64-s42wz               1/1     Running            0          18m
kube-keepalived-vip-sx8r7                 1/1     Running            0          17m
kube-proxy-64mbq                          1/1     Running            0          18m
kube-proxy-j2fqd                          1/1     Running            0          18m
kube-scheduler-controlplane               1/1     Running            0          18m
```

cheat sheet

```
> kubectl cluster-info
```

```
> kubectl get nodes
```

```
> kubectl get namespaces
```

```
> kubectl create -f <yaml file>
```

```
> kubectl apply -f <yaml file>
```

```
> kubectl run <name> --image <image>
```

```
> kubectl get pods
```

```
> kubectl get pods -w
```

```
> kubectl get pods -o wide
```

```
> kubectl get pods -n <namespace>
```

```
> kubectl get pods -l <label>
```

```
> kubectl logs <pod name>
```

```
> kubectl describe pod <pod name>
```

```
> kubectl delete pod <pod name>
```

GCP - GKE (Google Kubernetes Engine)

```
> gcloud container clusters create whatwant-school --num-nodes 3 --machine-type g1-small --no-enable-autoupgrade --zone us-central1-a
```

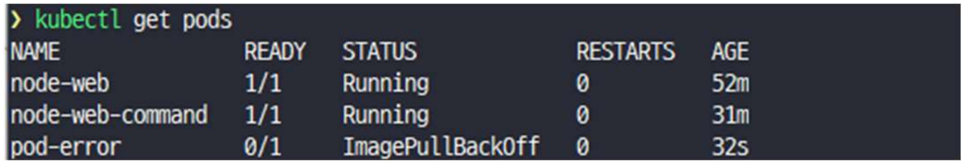
```
> gcloud container clusters delete whatwant-school --zone us-central1-a
```

trouble shooting

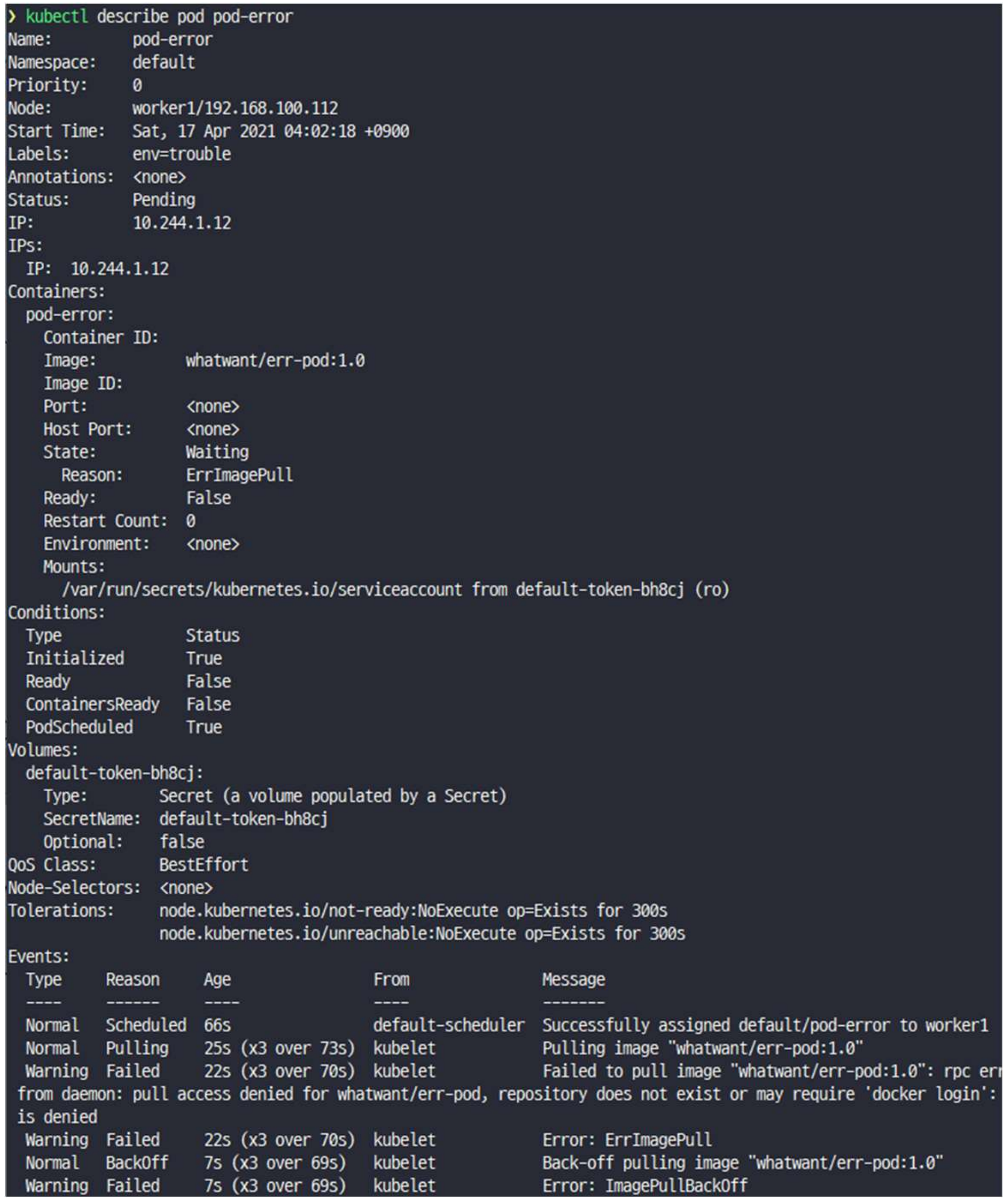
pod-error.yaml

```yaml
apiVersion: v1
kind: Pod
metadata:
  name: pod-error
  labels:
    env: trouble
spec:
  containers:
  - image: whatwant/err-pod:1.0
    name: pod-error
```

```
> kubectl apply -f pod-error.yaml
> kubectl get pods
> kubectl describe pod pod-error
```



```
❯ kubectl get pods
NAME               READY   STATUS             RESTARTS   AGE
node-web           1/1     Running            0          52m
node-web-command   1/1     Running            0          31m
pod-error          0/1     ImagePullBackOff   0          32s
```

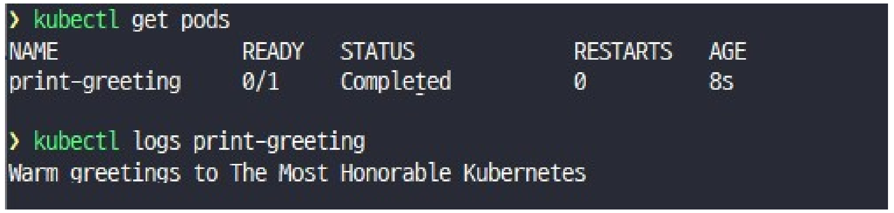


```
❯ kubectl describe pod pod-error
Name:         pod-error
Namespace:    default
Priority:     0
Node:         worker1/192.168.100.112
Start Time:   Sat, 17 Apr 2021 04:02:18 +0900
Labels:       env=trouble
Annotations:  <none>
Status:       Pending
IP:           10.244.1.12
IPs:
  IP:  10.244.1.12
Containers:
  pod-error:
    Container ID:
    Image:          whatwant/err-pod:1.0
    Image ID:
    Port:           <none>
    Host Port:      <none>
    State:          Waiting
      Reason:       ErrImagePull
    Ready:          False
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-bh8cj (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             False
  ContainersReady   False
  PodScheduled      True
Volumes:
  default-token-bh8cj:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  default-token-bh8cj
    Optional:    false
QoS Class:       BestEffort
Node-Selectors:  <none>
Tolerations:     node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                 node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type     Reason     Age                From               Message
  ----     ------     ----               ----               -------
  Normal   Scheduled  66s                default-scheduler  Successfully assigned default/pod-error to worker1
  Normal   Pulling    25s (x3 over 73s)  kubelet            Pulling image "whatwant/err-pod:1.0"
  Warning  Failed     22s (x3 over 70s)  kubelet            Failed to pull image "whatwant/err-pod:1.0": rpc err
 from daemon: pull access denied for whatwant/err-pod, repository does not exist or may require 'docker login':
 is denied
  Warning  Failed     22s (x3 over 70s)  kubelet            Error: ErrImagePull
  Normal   BackOff    7s (x3 over 69s)   kubelet            Back-off pulling image "whatwant/err-pod:1.0"
  Warning  Failed     7s (x3 over 69s)   kubelet            Error: ImagePullBackOff
```

Environment

pod-env.yaml

```
apiVersion: v1
kind: Pod
metadata:
  name: print-greeting
spec:
  containers:
  - name: env-print-demo
    image: bash
    env:
    - name: GREETING
      value: "Warm greetings to"
    - name: HONORIFIC
      value: "The Most Honorable"
    - name: NAME
      value: "Kubernetes"
    command: ["echo"]
    args: ["$(GREETING) $(HONORIFIC) $(NAME)"]
```



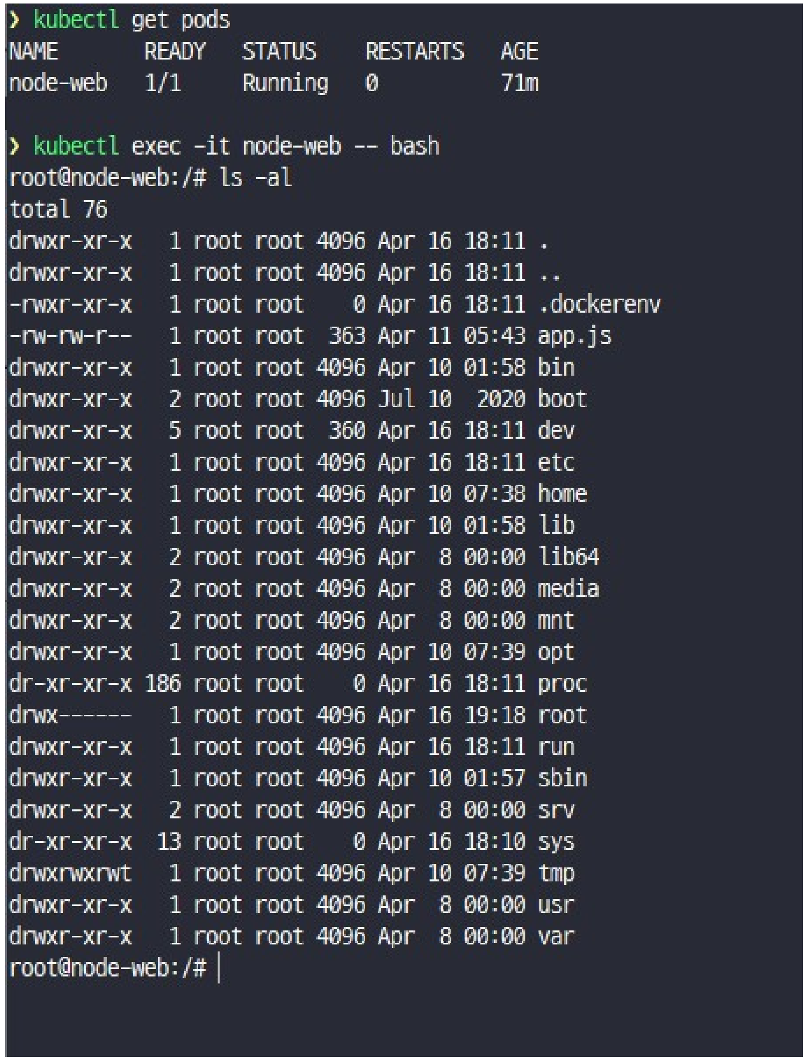
```
❯ kubectl get pods
NAME             READY   STATUS      RESTARTS   AGE
print-greeting   0/1     Completed   0          8s

❯ kubectl logs print-greeting
Warm greetings to The Most Honorable Kubernetes
```

```
> kubectl create -f pod-env.yaml
> kubectl get pods
> kubectl logs print-greeting
```

※ 참고 : https://kubernetes.io/ko/docs/tasks/inject-data-application/define-environment-variable-container/

exec

```
> kubectl get pods
> kubectl exec -it node-web -- bash
```



```
❯ kubectl get pods
NAME       READY   STATUS    RESTARTS   AGE
node-web   1/1     Running   0          71m

❯ kubectl exec -it node-web -- bash
root@node-web:/# ls -al
total 76
drwxr-xr-x   1 root root 4096 Apr 16 18:11 .
drwxr-xr-x   1 root root 4096 Apr 16 18:11 ..
-rwxr-xr-x   1 root root    0 Apr 16 18:11 .dockerenv
-rw-rw-r--   1 root root  363 Apr 11 05:43 app.js
drwxr-xr-x   1 root root 4096 Apr 10 01:58 bin
drwxr-xr-x   2 root root 4096 Jul 10  2020 boot
drwxr-xr-x   5 root root  360 Apr 16 18:11 dev
drwxr-xr-x   1 root root 4096 Apr 16 18:11 etc
drwxr-xr-x   1 root root 4096 Apr 10 07:38 home
drwxr-xr-x   1 root root 4096 Apr 10 01:58 lib
drwxr-xr-x   2 root root 4096 Apr  8 00:00 lib64
drwxr-xr-x   2 root root 4096 Apr  8 00:00 media
drwxr-xr-x   2 root root 4096 Apr  8 00:00 mnt
drwxr-xr-x   1 root root 4096 Apr 10 07:39 opt
dr-xr-xr-x 186 root root    0 Apr 16 18:11 proc
drwx------   1 root root 4096 Apr 16 19:18 root
drwxr-xr-x   1 root root 4096 Apr 16 18:11 run
drwxr-xr-x   1 root root 4096 Apr 10 01:57 sbin
drwxr-xr-x   2 root root 4096 Apr  8 00:00 srv
dr-xr-xr-x  13 root root    0 Apr 16 18:10 sys
drwxrwxrwt   1 root root 4096 Apr 10 07:39 tmp
drwxr-xr-x   1 root root 4096 Apr  8 00:00 usr
drwxr-xr-x   1 root root 4096 Apr  8 00:00 var
root@node-web:/# |
```

https://kahoot.it/