

Small Project 3

Membangun Infrastruktur Berbasis Container



Case Perusahaan Macross

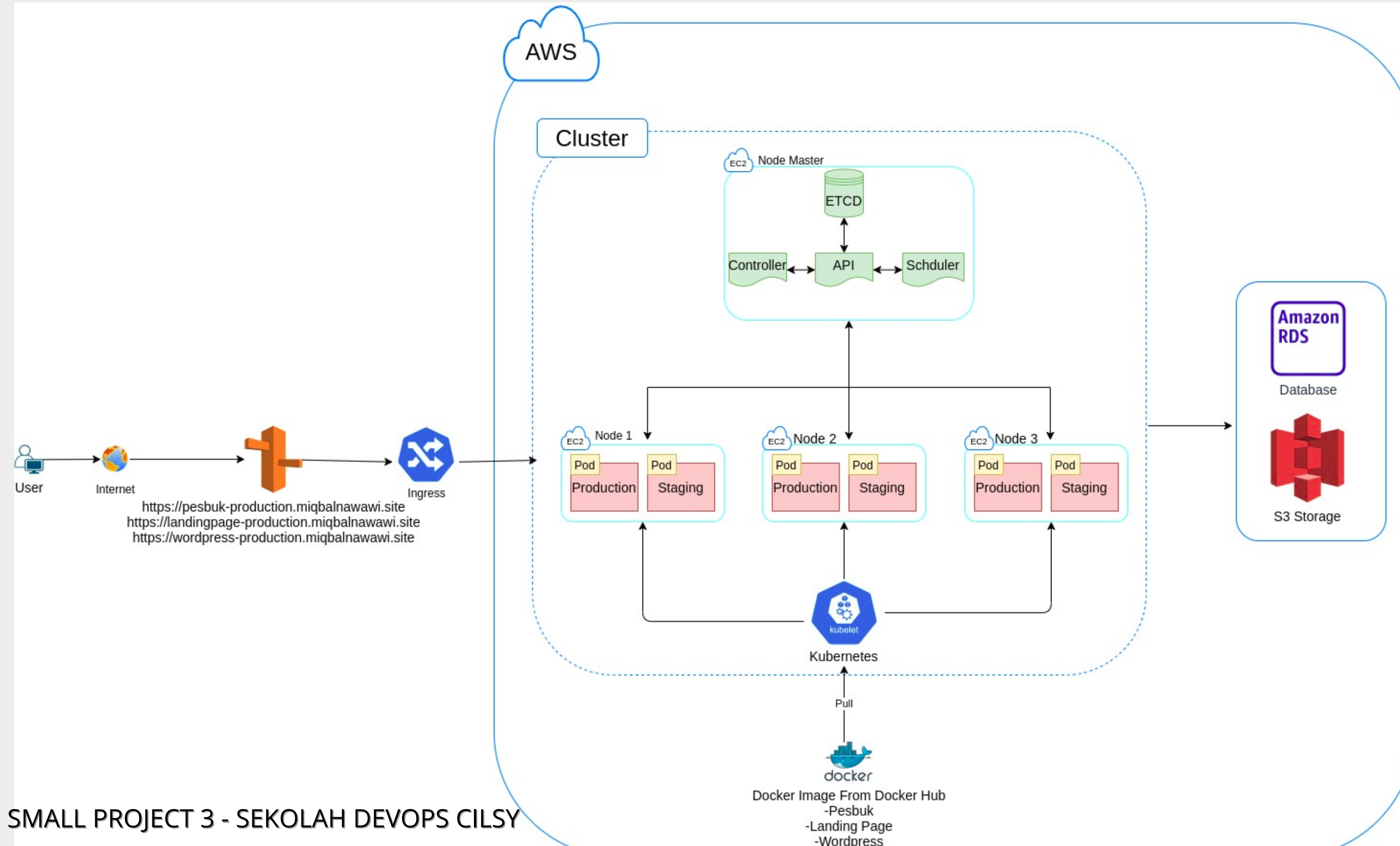
- Perusahaan akan memigrasikan layanan yang mereka miliki menjadi container basedengan mengintegrasikan ke layanan AWS
- Terdapat 2 server yaitu stagingdan production dengan tiga aplikasi yaitu sosial media pesbuk, website company, dan blog documentation berbasis wordpress
- Mereka berencana memindahkan semua service ke Kubernetes

Solution

- Membuat topologi yang cocok sesuai kebutuhan
- Membuat budgeting selama 3 bulan pemakaian
- Membuat Kubernetes menggunakan kops
- Mendeploy Image tersebut ke kubernetes cluster
- Membuat image dari 3 Aplikasi pesbuk,website company dan blog documentation
- Mengarahkan database aplikasi tersebut ke RDS dan domainnya diarahkan ke route53



TOPOLOGI



Estimate Budget

Service	Type	Count	Price
EC2	t2.medium	1	\$14.89
EC2	t2.small	4	\$33.29
S3	-	1	\$0.03
Route 53	-	1	\$0.50
RDS	t2.micro	1	\$21.80
<u>ELB</u>	Classic	1	\$20.50
Total <u>Moethly</u> Payment			\$70.51
3 Months Total Payment			\$211.53

CREATE CLUSTER WITH KOPS

Create Env :

```
export bucket_name=belajar-kubernetesexport  
KOPS_CLUSTER_NAME=belajarkubernetes.comexport  
KOPS_STATE_STORE=s3://{bucket_name}
```

Create Cluster Kubernetes :

```
kops create cluster --zones=ap-southeast-1 --node-count=3 --master-count=1 -  
-node-size=t2.micro --master-size=t2.medium --  
name=${KOPS_CLUSTER_NAME} --ssh-public-key=~/.ssh/id_rsa.pub
```

Update Cluster :

```
kops update cluster --name ${KOPS_CLUSTER_NAME} --yes --admin
```

Validate CLuster :

```
kops validate cluster
```

Cluster Created

Instances (5)

Info

↺

Connect

Instance state ▾

Actions ▾

Launch instances ▾

🔍 Filter instances

< 1 >

⚙️

Instance state: running ✕

Clear filters

<input type="checkbox"/>	Name ▾	Instance ID	Instance state ▾	Instance type ▾	Status check	Alarm status
<input type="checkbox"/>	nodes-ap-southeast-1a.kube.miqbalnawawi.site	i-09443a8904a897449	✔️ Running 🔍🔍	t2.micro	✔️ 2/2 checks passed	No alarms +
<input type="checkbox"/>	nodes-ap-southeast-1a.kube.miqbalnawawi.site	i-0916f32e5c4d60cf9	✔️ Running 🔍🔍	t2.micro	✔️ 2/2 checks passed	No alarms +
<input type="checkbox"/>	master-ap-southeast-1a.masters.kube.miqbalnaw...	i-04094033849bff1a6	✔️ Running 🔍🔍	t2.medium	✔️ 2/2 checks passed	No alarms +
<input type="checkbox"/>	nodes-ap-southeast-1a.kube.miqbalnawawi.site	i-094a0e7d583ec4cfa	✔️ Running 🔍🔍	t2.micro	✔️ 2/2 checks passed	No alarms +
<input type="checkbox"/>	kubernetes	i-0df05e9bbb127afff	✔️ Running 🔍🔍	t2.micro	✔️ 2/2 checks passed	No alarms +

Create Image Pesbuk

```
1 FROM ubuntu:bionic
2 RUN apt-get update
3 RUN apt-get install -y nginx php-fpm php-mysql
4 RUN echo "\ndaemon off;" >> /etc/nginx/nginx.conf
5 RUN sed -i -e "s/;\?daemonize\s*=\s*yes/daemonize = no/g" /etc/php/7.2/fpm/php-fpm.conf
6 RUN echo "\nclear_env = no" >> /etc/php/7.2/fpm/pool.d/www.conf
7 #COPY FILE
8 COPY . /var/www/html/
9 # Nginx config
10 RUN rm /etc/nginx/sites-enabled/default
11 ADD ./pesbuk.conf /etc/nginx/sites-available/
12 RUN ln -s /etc/nginx/sites-available/pesbuk.conf /etc/nginx/sites-enabled/pesbuk.conf
13 # Expose ports.
14 EXPOSE 80
15 # RUN PHP and NGINX
16 CMD /etc/init.d/php7.2-fpm start && nginx
```

1. Create Docker File Pesbuk
2. Docker Build -t pesbuk .
3. Docker run -it -d --name pesbuk -p 80:80 pesbuk:latest
4. Create repo in docker hub
5. Docker push miqbalnawawi/pesbuk

Apps

Image

Image
Registry

Create Image Landing Page

```
home > iqbal > Music > Dockerfile > ...
1 FROM ubuntu:bionic
2 RUN apt-get update
3 RUN DEBIAN_FRONTEND=noninteractive apt-get install mysql-server systemd nano nginx composer php7.2 php7.2-curl php7.2-common ph
4
5 RUN echo "\ndaemon off;" >> /etc/nginx/nginx.conf
6 RUN sed -i -e "s/;\?daemonize\s*=\s*yes/daemonize = no/g" /etc/php/7.2/fpm/php-fpm.conf
7 #COPY FILE
8 COPY . /var/www/html/
9 # Nginx config
10 RUN rm /etc/nginx/sites-enabled/default
11 ADD ./pesbuk.conf /etc/nginx/sites-available/
12 RUN ln -s /etc/nginx/sites-available/pesbuk.conf /etc/nginx/sites-enabled/pesbuk.conf
13 RUN nginx -t
14 # RUN systemctl restart nginx
15 # RUN sh -c 'cd /var/www/html && composer install && php artisan key:generate'
16 #RUN cd /var/www/html && composer install && php artisan key:generate && php artisan migrate --seed
17 RUN chmod -R 775 /var/www/html/ && chown -R root:www-data /var/www/html
18 RUN chmod -R 775 /var/www/html/* && chown -R root:www-data /var/www/html/*
19
20 RUN ln -s /var/lib/mysql/mysql.sock /tmp/mysql.sock
21 #RUN service mysql restart
22
23 # Expose ports.
24
25 EXPOSE 80
26 # RUN PHP and NGINX
27 CMD service php7.2-fpm start && nginx
```

1. Create Docker File landingpage
2. Docker Build -t landingpage .
3. Docker run -it -d --name landingpage -p 80:80 landingpage:latest
4. Create repo in docker hub
5. Docker push miqbalnawawi/landingpage

Apps

Image

Image
Registry

Create Image Wordpress

```
FROM ubuntu:bionic
RUN apt-get update
RUN apt-get install -y nginx php-fpm php-mysql
RUN echo "\ndaemon off;" >> /etc/nginx/nginx.conf
RUN sed -i -e "s/;\?daemonize\s*=\s*yes/daemonize = no/g" /etc/php/7.2/fpm/php-fpm.conf
#RUN echo "\nclear_env = no" >> /etc/php/7.2/fpm/pool.d/www.conf
#COPY FILE
COPY . /var/www/html/
# Nginx config
RUN rm /etc/nginx/sites-enabled/default
ADD ./wordpress.conf /etc/nginx/sites-available/
RUN ln -s /etc/nginx/sites-available/wordpress.conf /etc/nginx/sites-enabled/wordpress.conf
# Expose ports.
EXPOSE 80
# RUN PHP and NGINX
CMD /etc/init.d/php7.2-fpm start && nginx
```

1. Create Docker File wordpress
2. Docker Build -t wordpress .
3. Docker run -it -d --name wordpress -p 80:80 wordpress:latest
4. Create repo in docker hub
5. Docker push miqbalnawawi/wordpress

Apps

Image

Image
Registry

DEPLOY YAML

Fitur :

○ Ingress

● Secret

○ Name Space

● Cert SSL



DEPLOY PESBUK WITH YAML

Ingress

```
apiVersion: cert-manager.io/v1alpha2
kind: Issuer
metadata:
  name: pesbuk-staging
  namespace: pesbuk-staging
spec:
  acme:
    # The ACME server URL
    server: https://acme-v02.api.letsencrypt.org/directory
    # Email address used for ACME registration
    email: miqbalnawawill@gmail.com
    # Name of a secret used to store the ACME account private key
    privateKeySecretRef:
      name: pesbuk-staging
    # Enable the HTTP-01 challenge provider
    solvers:
    - selector: {}
      http01:
        ingress:
          class: nginx
```

Deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: pesbuk
  namespace: pesbuk-staging
spec:
  replicas: 3
  selector:
    matchLabels:
      name: pesbuk
      metadata: pesbuk
  template:
    metadata:
      labels:
        name: pesbuk
        metadata: pesbuk
    spec:
      containers:
      - name: pesbuk
        image: 000520624108.dkr.ecr.ap-southeast-1.amazonaws.com/pesbuk:latest
        ports:
        - containerPort: 80
        env:
          - name: DB_USER
            valueFrom:
              secretKeyRef:
                name: mysecret
                key: DB_USER
          - name: DB_PASS
            valueFrom:
              secretKeyRef:
                name: mysecret
                key: DB_PASS
          - name: DB_HOST
            valueFrom:
              secretKeyRef:
                name: mysecret
                key: DB_HOST
          - name: DB_NAME
            valueFrom:
              secretKeyRef:
                name: mysecret
                key: DB_NAME
```

CHECK RUNNING PESBUK

kubectl get pod -n pesbuk-production

```
root@ip-10-0-1-154:~/wp-staging# kubectl get pod -n pesbuk-production
NAME                                READY   STATUS    RESTARTS   AGE
pesbuk-f5d89f469-894lk             1/1     Running   0           8h
pesbuk-f5d89f469-b2c27             1/1     Running   0           8h
pesbuk-f5d89f469-qljcd             1/1     Running   0           8h
```

kubectl get ingress -n pesbuk-production

```
root@ip-10-0-1-154:~# kubectl get ingress -n pesbuk-production
Warning: extensions/v1beta1 Ingress is deprecated in v1.14+, unavailable in v1.22+; use networking.k8s.io/v1 Ingress
NAME          CLASS    HOSTS                                ADDRESS                                                                                                                                                                PORTS   AGE
pesbuk-ingress  <none>   pesbuk-production.miqbalnawawi.site  aca8048986dda410caad932920d5d446-1791905739.ap-southeast-1.elb.amazonaws.com  80, 443 12h
```

Pesbuk on browser with ssl



DEPLOY LANDING PAGE WITH YAML

Deployment

```
apiVersion: cert-manager.io/v1alpha2
kind: Issuer
metadata:
  name: landingpage-production
  namespace: landing-page-production
spec:
  acme:
    # The ACME server URL
    server: https://acme-v02.api.letsencrypt.org/directory
    # Email address used for ACME registration
    email: miqbalnawawill@gmail.com
    # Name of a secret used to store the ACME account private key
    privateKeySecretRef:
      name: landingpage-production
    # Enable the HTTP-01 challenge provider
    solvers:
    - selector: {}
      http01:
        ingress:
          class: nginx
```

Ingress

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: landing-page-production
  namespace: landing-page-production
spec:
  replicas: 3
  selector:
    matchLabels:
      name: landing-page-production
  template:
    metadata:
      labels:
        name: landing-page-production
    spec:
      containers:
      - name: landing-page-production
        image: vanillavladimir/landing_page
---
apiVersion: v1
kind: Service
metadata:
  name: landing-page-production
  namespace: landing-page-production
spec:
  #type: LoadBalancer
  ports:
  - port: 80
  selector:
    name: landing-page-production
---
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  name: landing-page-production
  namespace: landing-page-production
  annotations:
    nginx.ingress.kubernetes.io/rewrite-target: /
    kubernetes.io/ingress.class: "nginx"
    cert-manager.io/issuer: "landingpage-production"
spec:
  rules:
  - host: landingpage-production.miqbalnawawi.site
    http:
      paths:
      #- path: /belajar
```

```
root@ip-10-0-1-154:~/wp-staging# kubectl get pod -n landing-page-production
```

NAME	READY	STATUS	RESTARTS	AGE
landing-page-production-585c7cd9f8-5jck6	1/1	Running	0	8h
landing-page-production-585c7cd9f8-fbmq9	1/1	Running	0	8h
landing-page-production-585c7cd9f8-slzgm	1/1	Running	0	8h

```
root@ip-10-0-1-154:~/wp-staging#
```

```
root@ip-10-0-1-154:~# kubectl get ingress -n landing-page-production
Warning: extensions/v1beta1 Ingress is deprecated in v1.14+, unavailable in v1.22+; use networking.k8s.io/v1 Ingress
```

NAME	CLASS	HOSTS	ADDRESS	PORTS	AGE
landing-page-production	<none>	landingpage-production.miqbalnawawi.site	aca8048986dda410caad932920d5d446-1791905739.ap-southeast-1.elb.amazonaws.com	80, 443	12h



← → ↻ <https://landingpage-production.miqbalnawawi.site> ☆

TEKKADAN

ABOUT SERVICES PORTFOLIO CONTACT

BUAT APLIKASI IMPIANMU BERSAMA KAMI

Tekkadan merupakan sebuah startup software developent yang menyediakan pembuatan website beserta sistem yang terintegrasi dengan Cloud Platfrom AWS

TEMUKAN LEBIH BANYAK

DEPLOY WORDPRESS WITH YAML

deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: wp-staging
  namespace: wp-staging
spec:
  replicas: 1
  selector:
    matchLabels:
      name: wp-staging
  template:
    metadata:
      labels:
        name: wp-staging
    spec:
      containers:
        - name: wp-staging
          image: 000520624108.dkr.ecr.ap-southeast-1.amazonaws.com/wp-stag:latest
          env:
            - name: DB_HOST
              value: "pesbuk.cfqjeymqvkfq.ap-southeast-1.rds.amazonaws.com"
            - name: DB_USER
              value: "admin"
            - name: DB_PASS
              value: "admin12345"
            - name: DB_NAME
              value: "wordpress"
---
apiVersion: v1
kind: Service
metadata:
  name: wp-staging
  namespace: wp-staging
spec:
  #type: LoadBalancer
  ports:
    - port: 80
  selector:
    name: wp-staging
```

Ingress

```
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  name: wp-staging-ingress
  namespace: wp-staging
  annotations:
    nginx.ingress.kubernetes.io/rewrite-target: /
    kubernetes.io/ingress.class: "nginx"
    cert-manager.io/issuer: "wp-staging"
spec:
  rules:
    - host: wp-staging.miqbalnawawi.site
      http:
        paths:
          #- path: /belajar
          - backend:
              serviceName: wp-staging
              servicePort: 80
  tls:
    - hosts:
        - wp-staging.miqbalnawawi.site
      secretName: wp-staging-tls
```


CHECK RUNNING WORDPRESS

kubectl get pod -n wp-staging

```
root@ip-10-0-1-154:~/wp-staging# kubectl get pod -n wp-staging
NAME                                READY   STATUS    RESTARTS   AGE
wp-staging-5bc764ddb7-w5zxz        1/1     Running   0           12m
root@ip-10-0-1-154:~/wp-staging#
```

kubectl get ingress -n wp-staging

```
psbook ingress <none> psbook production.miqbalnawawi.site aca8048986dda410caad932920d5d446-1791905739.ap-southeast-1.elb.amazonaws.com 80, 443 12m
root@ip-10-0-1-154:~# kubectl get ingress -n wp-staging
Warning: extensions/v1beta1 Ingress is deprecated in v1.14+, unavailable in v1.22+; use networking.k8s.io/v1 Ingress
NAME                CLASS    HOSTS                                ADDRESS                                                                 PORTS   AGE
wp-staging-ingress  <none>   wp-staging.miqbalnawawi.site        aca8048986dda410caad932920d5d446-1791905739.ap-southeast-1.elb.amazonaws.com 80, 443 59m
root@ip-10-0-1-154:~#
```

Thank You



Contact Me :

Github : github.com/miqbalnawawi

LinkedIn : [linkedin.com/in/muhammad-iqbal-nawawi-73a993165/](https://www.linkedin.com/in/muhammad-iqbal-nawawi-73a993165/)

Telegram : @miqbalnawawi