A506 포팅메뉴얼

구축 환경

서비스 아키텍쳐

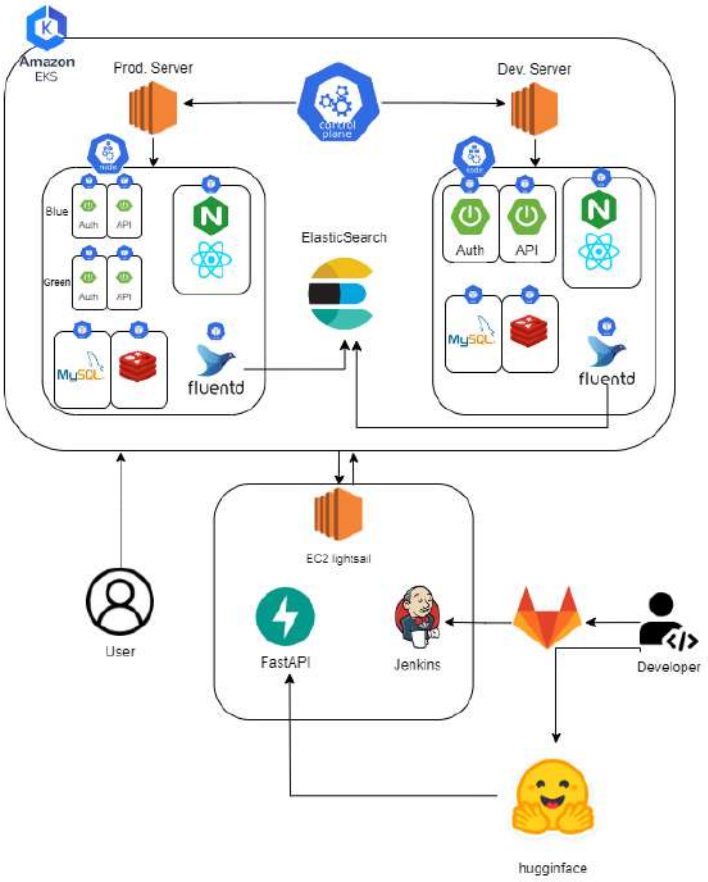
- 공통
  - fluentd (노드 데몬셋)
  - elasticsearch
  - kibana

노드1

- 개발서버
  - 인증인가 서버
  - api 서버
- 개발 db
  - mysql
  - redis

노드 2

- 프론트 서버
  - nginx
- 배포서버
  - 인증인가 서버
  - api 서버
    - blue
    - green



- 배포 db
  - mysql
  - redis

lightsail

- 모델 추론 서버
- Jenkins
- 판례 크롤링 조회 서버
- kibana, elasticsearch ?

▼ kubectl 주요 명령어 모음

- kube 모든 리소스 조회

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

- kube 리소스 조회

```
kubectl get {리소스 종류} {리소스 이름} -n {네임스페이스}
```

```
-n 말고 --all-namespaces 붙이면 모든 네임스페이스 조회
```

- 파드 describe

```
kubectl describe pod -l app=${앱 이름} -n {네임스페이스}
```

- 파드 로그 조회

```
kubectl logs -f [파드 이름] -n {네임스페이스}
```

- kube 리소스 지우기

```
kubectl delete -n {네임스페이스 명} {리소스 종류} {리소스 이름}
```

- 네임스페이스 생성

```
kubectl create namespace {이름}
```

- 롤링업데이트 트리거

```
kubectl edit deployment [deployment_name]
```

- patch 명령

```
kubectl patch {리소스} {리소스명} -n {네임스페이스} -p "{내용}"
```

필요한 작업들

▼ Lightsail 초기 설정

- 시간 맞추기
- 미러서버
- 방화벽 풀기
- 도커 설치
- 젠킨스 이미지 띄우기
- AWS CLI 설치

```
sudo apt install awscli
aws --version
```

- 해당 명령어로 configuration 정보 입력 (AWS 액세스 키 발급 받기)

```
aws configure
# 1. AWS Access Key ID [None]:
# 2. AWS Secret Access Key [None]:
# 3. Default region name [None]: 가용영역에서 확인
# 4. Default output format [None]: json
```

- kubectl 설치

```
curl -LO "[https://storage.googleapis.com/kubernetes-release/release/$](https://storage.googleapis.com/kubernetes-release/release/$)(curl -s [https://storage.googleapis.com/kubernetes-release/release/stable.txt](https://storage.googleapis.com/kubernetes-release/release/stable.txt))/bin/linux/amd64/kubectl"
```

- kubectl 쓰기권한추가

  `chmod +x ./kubectl`

- kubectl 이동

  `sudo mv ./kubectl /usr/local/bin`

- 설치확인

  `kubectl version`

- eksctl 설치
  - Aws EKS Clusters 를 생성하기 위해 eksctl을 설치한다.

```
curl --silent --location "[https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_$](https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_$)(uname -s)_amd64.tar.gz" | tar xz -C /tmp
```

  - eksctl 이동

```
sudo mv /tmp/eksctl /usr/local/bin
```

  - 설치 확인

`eksctl version`

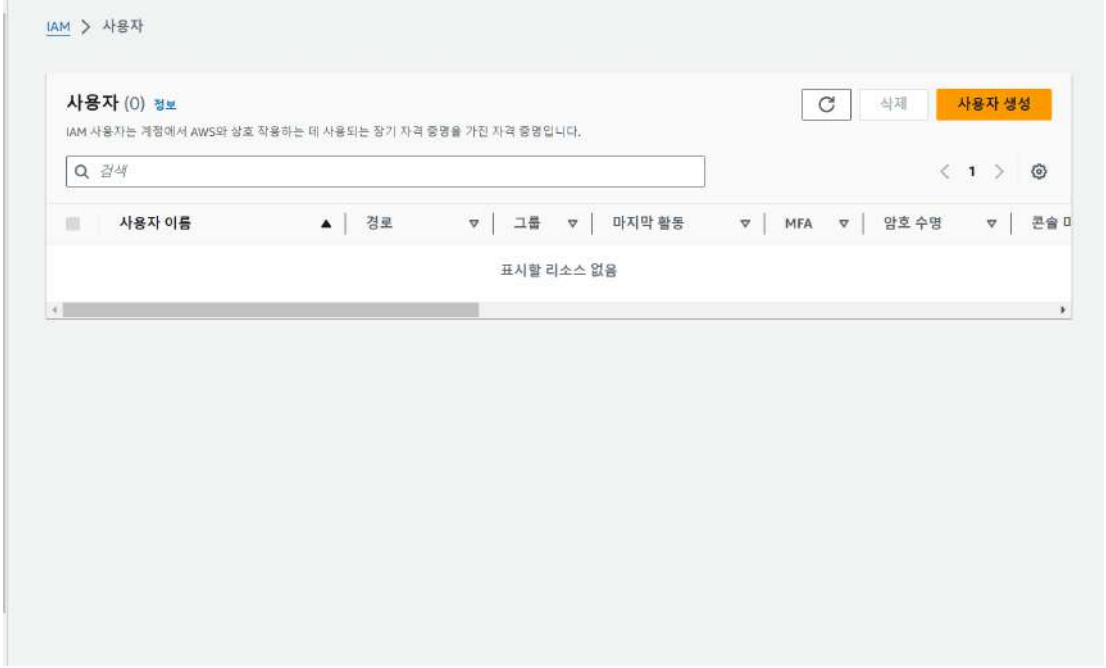
  - eksctl 활용해서 EKS Cluster 생성

```
eksctl create --name 클러스터 이름 --version 버전 --region 지역명(한국은 ap-northeast-2) --nodegroup-name 노드그룹 이름 --node-type 노드타입 --nodes 노드개수 --nodes-min 지정
```

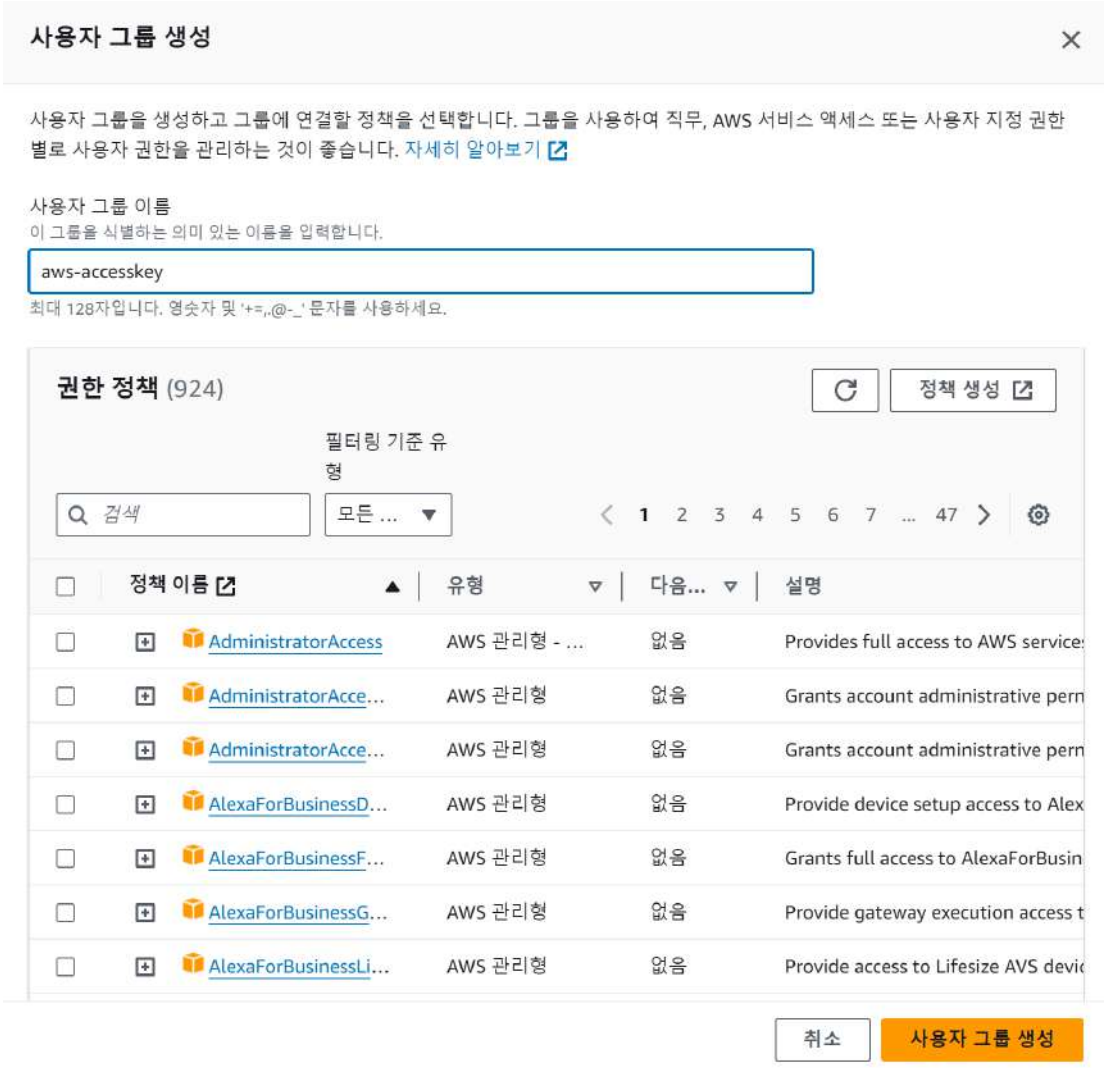
```
할 노드 최소개수 --nodes-max 지정할 노드 최대개수 --ssh-acce
ss --ssh-public-key 워커노드접속에 사용할 키 --managed
```

▼ AWS 액세스키 생성

- AWS IAM에서 사용자 탭에 접속하여 사용자 등록하기



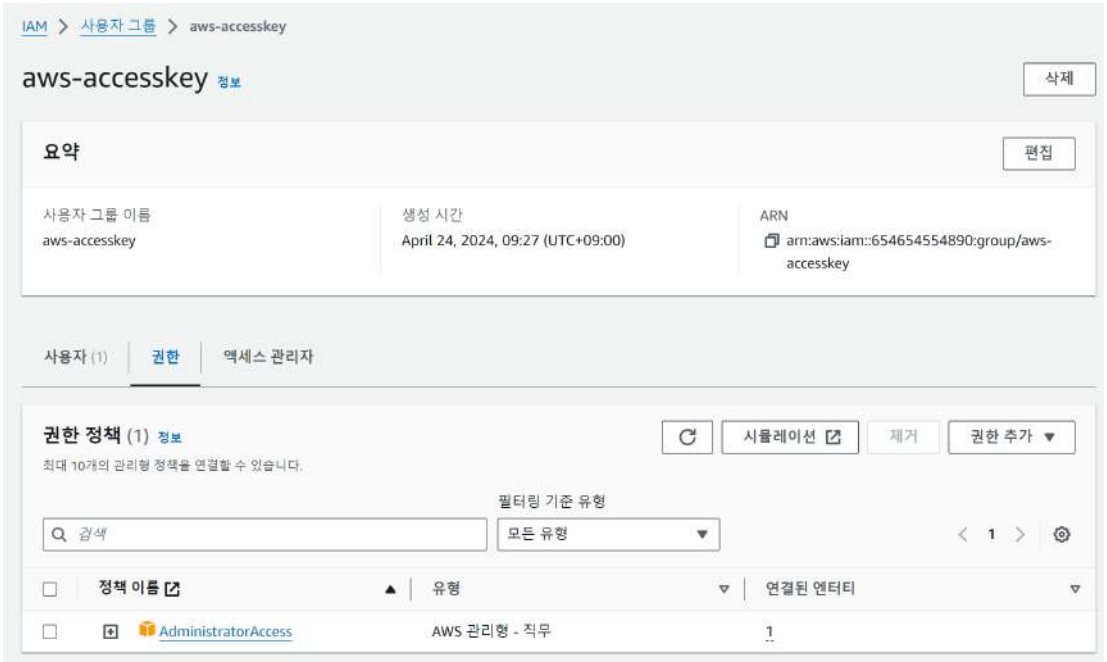
- 사용자 그룹 생성 후 등록하기



- 생성된 사용자 눌러서 액세스 키 추가하기

만들어서 따로 기록해둔다 !

- 이후 사용자 그룹 정책을 설정한다 (full access 로 설정함)



▼ AWS CLI 설정

- EC2에서 `eksctl` 을 사용하기 위해 AWS CLI를 설치한다.
  - `sudo apt install awscli`
  - `aws --version`
- AWS CLI 설정

- AWS CLI 가 AWS 환경과 소통하고 인증할 수있도록 설정
- `aws configure` 명령어를 입력하ㅅㄹ면 아래 내용을 입력해야한다.

```
1. AWS Access Key ID [None]:
2. AWS Secret Access Key [None]:
3. Default region name [None]: 입력 x
4. Default output format [None]: json
```

▼ Kubectl 설치

- kubectl 설치

```
curl -LO "https://dl.k8s.io/release/v1.29.0/bin/linux/amd64/kubectl"
```

- kubectl 쓰기권한추가

```
chmod +x ./kubectl
```

- kubectl 이동

```
sudo mv ./kubectl /usr/local/bin
```

- 설치확인

```
kubectl version
```

▼ eksctl 설치

- Aws EKS Clusters 를 생성하기 위해 eksctl을 설치한다.

```
curl --silent --location "https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_$(uname -s)_amd64.tar.gz" | tar xz -C /tmp
```

- eksctl 이동

```
sudo mv /tmp/eksctl /usr/local/bin
```

- 설치 확인

`eksctl version`

▼ EKS

```
eksctl create --name 클러스터 이름 --version 버전 --region 지역명(한국은 ap-northeast-2) --nodegroup-name 노드그룹이름 --node-type 노드타입 --nodes 노드개수 --nodes-min 지정할 노드 최소개수 --nodes-max 지정할 노드 최대개수 --ssh-access --ssh-public-key 워커노드접속에 사용할 키 --managed
```

```
eksctl create cluster --name mycluster --region ap-northeast-2 --nodegroup-namemygroup --node-type t2.xlarge --nodes 2 --nodes-min 2 --nodes-max 2 --managed
```

```
aws eks --region ap-northeast-2 update-kubeconfig --name mycluster
```

- EKS 서비스 어카운트 : Jenkins에서 EKS에 접근하기 위한 계정, 일종의 크레덴셜

▼ Jenkins 초기 설정 및 GitLab 연동

- 플러그인

```
# ssh 커맨드 입력에 사용
SSH Agent

# docker 이미지 생성에 사용
Docker
Docker Commons
Docker Pipeline
Docker API
```

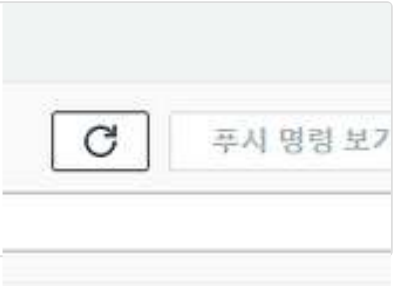
```
# 웹훅을 통해 브랜치 merge request 이벤트 발생시 Jenkins 자동 빌드에 사용
Generic Webhook Trigger

# 타사 레포지토리 이용시 사용 (GitLab, Github 등)
GitLab
GitLab API
GitLab Authentication

# Node.js 빌드시 사용
NodeJS

# Jenkins Stage Vie (파이프라인 시각화)
Pipeline: Stage View Plugin

# AWS 관련
AWS Global Configuration
AWS Credentials
AWS ECR

# K8s
Kubernetes Plugin
Kubernetes CLI
```

▼ Jenkins AWS 연동

Jenkins Pipeline을 이용하여 Docker Image를 ECR로 Push

안녕하세요. 오늘 글은 지난 시간에 이어서 Jenkins Pipeline을 이용하여 Docker Image Build 후 AWS ECR로 Push 하는 방법에 대해서 다뤄볼까 합니다. 준비물 : AWS Accesss Key, AWS IAM(ECR

https://teichae.tistory.com/entry/Jenkins-Pipeline을-이용한-Docker-Image를-ECR로-Push



- AWS IAM 생성 후 젠킨스 크레덴셜 등

▼ FastApi 젠킨스 설정 + 파이프라인

```
pipeline {
    agent any

    stages {
        stage('github clone') {
            steps {
                git branch: 'back-ai-deploy',
                    credentialsId: 'gitlab-credential',
                    url: 'https://lab.ssafy.com/s10-final/S
            }
        }

        stage('Containers Restart') {
            steps {
                script {
                    sh 'docker-compose down'
                    sh 'docker-compose up --build -d'
                }
            }
        }
    }
}
```

▼ FastApi 도커 설정

- Dockerfile

```
FROM python:latest

WORKDIR /app/

COPY ./*.py /app/
COPY ./.env /app/
COPY ./requirements.txt /app/

RUN pip install -r requirements.txt

CMD uvicorn --host=0.0.0.0 --port 8000 main:app
```

- 도커 명령어

```
docker build --tag inferServer .
```

```
docker run -d -p 8000:8000 --name inferServer inferServer
```

- Docker-Compose

```
version: "3.8"

services:
  app:
    build:
      context: ./
      dockerfile: Dockerfile
    container_name: inferServer
    ports:
      - "8000:8000"
    restart: on-failure
    volumes:
        - ./fastapi:/model
```

▼ 개발서버 쿠버네티스 매니페스트

▼ Ingress

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: dev-ingress
  namespace: development
  annotations:
    kubernetes.io/ingress.class: "alb"
    alb.ingress.kubernetes.io/scheme: internet-facing
    alb.ingress.kubernetes.io/target-type: ip
    alb.ingress.kubernetes.io/listen-ports: '[{"HTTP
S": 443}]'
    alb.ingress.kubernetes.io/certificate-arn: "arn:a
ws:acm:ap-northeast-2:654654554890:certificate/ec3eb1
f1-9f69-4a39-8bc6-79b9217110d9"
spec:
  tls:
    - hosts:
      - test.hellolaw.kr
  rules:
  - host: test.hellolaw.kr
  - http:
      paths:
      - path: /
        pathType: Prefix
        backend:
          service:
            name: nginx-service
            port:
              number: 80
      - path: /api/
        pathType: Prefix
        backend:
          service:
            name: back-api-service
            port:
              number: 8082
```

```
    - path: /auth/
      pathType: Prefix
      backend:
        service:
          name: back-auth-service
          port:
            number: 8099
    - path: /kibana/
      pathType: Prefix
      backend:
        service:
          name: kibana
          port:
            number: 5601
```

▼ **프론트**

▼ Service

```
apiVersion: v1
kind: Service
metadata:
  name: nginx-service
  namespace: development
spec:
  type: ClusterIP
  selector:
    app: hellolaw-front
  ports:
  - protocol: TCP
    port: 80
    targetPort: 80
```

▼ deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
```

```
  name: hellolaw-front
  namespace: development
spec:
  replicas: 1
  revisionHistoryLimit: 0  # 보유할 ReplicaSet의 최대
개수
  selector:
    matchLabels:
      app: hellolaw-front
  template:
    metadata:
      labels:
        app: hellolaw-front
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExe
cution:
            nodeSelectorTerms:
            - matchExpressions:
              - key: role
                operator: In
                values:
                - development
      containers:
      - name: hellolaw-front
        image: 654654554890.dkr.ecr.ap-northeast-
2.amazonaws.com/hellolaw-front:latest
        ports:
        - containerPort: 3000
```

▼ 백 api

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hellolaw-api
```

```
  namespace: development
spec:
  replicas: 1
  revisionHistoryLimit: 0
  selector:
    matchLabels:
      app: hellolaw-api
  template:
    metadata:
      labels:
        app: hellolaw-api
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExecutior
            nodeSelectorTerms:
              - matchExpressions:
                  - key: role
                    operator: In
                    values:
                      - development
      containers:
      - name: backend
        image: 654654554890.dkr.ecr.ap-northeast-2.amazc
        imagePullPolicy: Always
        ports:
        - containerPort: 8082
        env:
        - name: SPRING_PROFILES_ACTIVE
          value: "dev"
        - name: MYSQL_HOST
          value: mysql-service
        - name: DB_USER
          value: hellolaw_dev
        - name: DB_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysql-secret
```

```
              key: password
---

apiVersion: v1
kind: Service
metadata:
  name: back-api-service
  namespace: development
spec:
  selector:
    app: hellolaw-api
  ports:
    - protocol: TCP
      port: 8082
      targetPort: 8082
```

▼ 백 auth

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hellolaw-auth
  namespace: development
spec:
  replicas: 1
  revisionHistoryLimit: 0  # 보유할 ReplicaSet의 최대 개수
  selector:
    matchLabels:
      app: hellolaw-auth
  template:
    metadata:
      labels:
        app: hellolaw-auth
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExecutior
```

```
            nodeSelectorTerms:
              - matchExpressions:
                  - key: role
                    operator: In
                    values:
                      - development
      containers:
      - name: backend
        image: 654654554890.dkr.ecr.ap-northeast-2.amazo
        ports:
        - containerPort: 8099
        env:
        - name: SPRING_PROFILES_ACTIVE
          value: "dev"
        - name: MYSQL_HOST
          value: mysql-service
        - name: DB_USER
          value: hellolaw_dev
        - name: DB_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysql-secret
              key: password


---

apiVersion: v1
kind: Service
metadata:
  name: back-auth-service
  namespace: development
spec:
  selector:
    app: hellolaw-auth
  ports:
    - protocol: TCP
```

```
      port: 8099
      targetPort: 8099
```

▼ 배포서버 쿠버네티스 매니페스트

▼ Ingress

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: prod-ingress
  namespace: production
  annotations:
    kubernetes.io/ingress.class: "alb"
    alb.ingress.kubernetes.io/scheme: internet-facing
    alb.ingress.kubernetes.io/target-type: ip
    alb.ingress.kubernetes.io/listen-ports: '[{"HTTP
S": 443}]'
    alb.ingress.kubernetes.io/certificate-arn: "arn:a
ws:acm:ap-northeast-2:654654554890:certificate/ec3eb1
f1-9f69-4a39-8bc6-79b9217110d9"
spec:
  tls:
    - hosts:
      - hellolaw.kr
  rules:
  - host: hellolaw.kr
  - http:
      paths:
      - path: /
        pathType: Prefix
        backend:
          service:
            name: nginx-service
            port:
              number: 80
      - path: /api/
        pathType: Prefix
        backend:
```

```
          service:
            name: back-api-service
            port:
              number: 8082
      - path: /auth/
        pathType: Prefix
        backend:
          service:
            name: back-auth-service
            port:
              number: 8099
```

▼ 프론트

▼ deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hellolaw-front
  namespace: production
spec:
  replicas: 1
  revisionHistoryLimit: 2  # 보유할 ReplicaSet의 최대
개수 <- 버전 롤백 위해서 여러개 설정
  selector:
    matchLabels:
      app: hellolaw-front
  template:
    metadata:
      labels:
        app: hellolaw-front
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExe
cution:
```

```
            nodeSelectorTerms:
            - matchExpressions:
              - key: role
                operator: In
                values:
                - production
      containers:
      - name: hellolaw-front
        image: 654654554890.dkr.ecr.ap-northeast-
2.amazonaws.com/hellolaw-front:latest
        imagePullPolicy: Always
        ports:
        - containerPort: 3000

---

apiVersion: v1
kind: Service
metadata:
  name: nginx-service
  namespace: production
spec:
  type: ClusterIP
  selector:
    app: hellolaw-front
  ports:
  - protocol: TCP
    port: 80
    targetPort: 80
```

▼ 백 api

▼ service

```
apiVersion: v1
kind: Service
```

```
metadata:
  name: back-api-service
  namespace: production
spec:
  selector:
    app: hellolaw-api
    color: blue
  ports:
    - protocol: TCP
      port: 8082
      targetPort: 8082
```

▼ blue

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hellolaw-api-blue
  namespace: production
spec:
  replicas: 2
  selector:
    matchLabels:
      app: hellolaw-api
      color: blue
  template:
    metadata:
      labels:
        app: hellolaw-api
        color: blue
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExe
cution:
            nodeSelectorTerms:
              - matchExpressions:
                  - key: role
```

```
                    operator: In
                    values:
                      - production
      containers:
      - name: backend
        image: 654654554890.dkr.ecr.ap-northeast-
2.amazonaws.com/hellolaw-back-api:latest
        imagePullPolicy: Always
        ports:
        - containerPort: 8082
        env:
        - name: SPRING_PROFILES_ACTIVE
          value: "prod"
        - name: MYSQL_HOST
          value: mysql-service
        - name: DB_USER
          value: hellolaw_prod
        - name: DB_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysql-secret
              key: password
```

▼ green

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hellolaw-api-green
  namespace: production
spec:
  replicas: 2
  selector:
    matchLabels:
      app: hellolaw-api
      color: green
  template:
    metadata:
```

```
      labels:
        app: hellolaw-api
        color: green
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExe
cution:
            nodeSelectorTerms:
              - matchExpressions:
                  - key: role
                    operator: In
                    values:
                      - production
      containers:
      - name: backend
        image: 654654554890.dkr.ecr.ap-northeast-
2.amazonaws.com/hellolaw-back-api:latest
        imagePullPolicy: Always
        ports:
        - containerPort: 8082
        env:
        - name: SPRING_PROFILES_ACTIVE
          value: "prod"
        - name: MYSQL_HOST
          value: mysql-service
        - name: DB_USER
          value: hellolaw_prod
        - name: DB_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysql-secret
              key: password
```

```
//blue-green.yml
spec:
    selector:
```

```
        app: hellolaw-api
        color: blue
```

▼ 백 auth

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: hellolaw-auth
  namespace: production
spec:
  replicas: 1
  revisionHistoryLimit: 0  # 보유할 ReplicaSet의 최대 개
수
  selector:
    matchLabels:
      app: hellolaw-auth
  template:
    metadata:
      labels:
        app: hellolaw-auth
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExecut
ion:
            nodeSelectorTerms:
            - matchExpressions:
              - key: role
                operator: In
                values:
                - production
      containers:
      - name: backend
        image: 654654554890.dkr.ecr.ap-northeast-2.am
azonaws.com/hellolaw-back-auth:latest
        imagePullPolicy: Always
        ports:
```

```
        - containerPort: 8099
        env:
        - name: SPRING_PROFILES_ACTIVE
          value: "prod"
        - name: MYSQL_HOST
          value: mysql-service
        - name: DB_USER
          value: hellolaw_prod
        - name: DB_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysql-secret
              key: password


---

apiVersion: v1
kind: Service
metadata:
  name: back-auth-service
  namespace: production
spec:
  selector:
    app: hellolaw-auth
  ports:
    - protocol: TCP
      port: 8099
      targetPort: 8099
```

▼ 프론트 CICD

쿠버네티스에서 nginx에 리액트 앱을 감싼 형태를 컨테이너 1개로 배포.

0. SCM
1. Dockerfile 이용해서 프론트 도커라이징
2. ECR에 푸쉬

3. kubectl로 해당 이미지 띄우기. (kubectl apply -f ~~)

▼ Dockerfile

```
FROM node:18-alpine as build

RUN npm install -g pnpm

WORKDIR /app

COPY package.json ./
COPY pnpm-lock.yaml ./

RUN pnpm install

COPY . .

RUN pnpm build

######

FROM nginx:stable-alpine

RUN rm -rf /etc/nginx/conf.d/default.conf

RUN rm -rf /usr/share/nginx/html/*

COPY --from=build /app/dist /usr/share/nginx/html

COPY nginx.conf /etc/nginx/conf.d/default.conf

EXPOSE 3000

CMD ["nginx", "-g", "daemon off;"]
```

▼ 파이프라인

```
pipeline {
    agent any
```

```
    environment{
        REGION = 'ap-northeast-2'
        EKS_API = 'https://F73C5F6407E7C0DFD2AF34C773B41
        EKS_CLUSTER_NAME = 'mycluster'
        EKS_JENKINS_CREDENTIAL_ID = 'kubectl-credential'
        ECR_PATH = '654654554890.dkr.ecr.ap-northeast-2.
        IMAGE_NAME = 'hellolaw-front'
        AWS_CREDENTIAL_ID = 'aws-credential'

    }
    stages {
        stage('MMAlert-start') {
            steps {
                sh '''
                  curl -d '{"text":"## Front-Dev Deploy
                  '''
            }
        }
        stage('github clone') {
            steps {
                git branch: 'front-develop',
                    credentialsId: 'gitlab-credential',
                    url: 'https://lab.ssafy.com/s10-fina
            }
        }
        stage('Docker Build') {
            steps {
                script{
                    sh '''
                        docker build -t ${IMAGE_NAME}:$B
                        docker tag ${IMAGE_NAME}:$BUILD_
                    '''
                }
            }
        }
        stage('Push to ECR'){
            steps{
```

```
                script{
                    docker.withRegistry("https://${ECR_R
                        docker.image("${IMAGE_NAME}:${BU
                        docker.image("${IMAGE_NAME}:late
                    }
                }
            }

        }
        stage('deployment download'){
            steps{
                script{
                    withCredentials([file(credentialsId:
                        sh 'cp $deployment ./deployment.
                    }
                }
            }
        }

        stage('Deploy to k8s'){
            steps{
                script{
                    sh """
                        sed -i 's|latest|${BUILD_NUMBER}
                        kubectl apply -f deployment.yml
                    """

                }
            }
        }
        stage('Frontend Health Check') {
            steps {
                script {
                    def attempts = 10
                    def healthCheckPassed = false

                    for (int i = 0; i < attempts; i++) {
```

```
                        def indexResponse = sh script: "

                        if (indexResponse.trim() == '200
                            echo "Frontend static file c
                            healthCheckPassed = true
                            sh '''
                            curl -d '{"text":"## Front-D
                            '''
                            break
                        }
                        sleep time: 1, unit: 'SECONDS'
                    }

                    if (!healthCheckPassed) {
                        echo "Frontend static file check
                        sh '''
                        curl -d '{"text":"## Front-Dev D
                        '''
                        error("Deployment failed due to
                    }
                }
            }
        }
    }
}
```

- nginx.conf

```
server {
    listen 80;
    server_name localhost;
    location / {
        root /usr/share/nginx/html;
        index index.html index.htm;
        try_files $uri $uri/ /index.html;
    }
}
```

▼ 백 CICD

▼ Dockerfile

```
FROM openjdk:17-jdk-slim

WORKDIR /app

ARG JAR_FILE=build/libs/*.jar

COPY ${JAR_FILE} app.jar

EXPOSE 8082

ENTRYPOINT ["java", "-jar", "app.jar"]
```

- 파이프라인

▼ 개발서버 예시

```
pipeline {
    agent any

    environment{
        REGION = 'ap-northeast-2'
        EKS_API = 'https://F73C5F6407E7C0DFD2AF34C773
        EKS_CLUSTER_NAME = 'mycluster'
        EKS_JENKINS_CREDENTIAL_ID = 'kubectl-credenti
        ECR_PATH = '654654554890.dkr.ecr.ap-northeast
        IMAGE_NAME = 'hellolaw-back-auth'
        AWS_CREDENTIAL_ID = 'aws-credential'

    }
    stages {
        stage('MMAlert-start') {
            steps {
                sh '''
                  curl -d '{"text":"## Back-Auth-Dev
                  '''
```

```
            }
        }
        stage('github clone') {
            steps {
                git branch: 'back-auth-develop',
                    credentialsId: 'gitlab-credential
                    url: 'https://lab.ssafy.com/s10-f
            }
        }
        stage('application.yml download') {
            steps {
                withCredentials([file(credentialsId:
                    script {
                        dir('back-auth'){
                            if (fileExists('src/main/
                                sh 'rm src/main/resou
                            }
                            sh 'mkdir -p src/main/res
                            sh 'cp $ymlfile src/main/
                        }
                    }
                }
                withCredentials([file(credentialsId:
                    script {
                        dir('back-auth'){
                            if (fileExists('src/main/
                                sh 'rm src/main/resou
                            }
                            sh 'mkdir -p src/main/res
                            sh 'cp $ymlfile src/main/
                        }
                    }
                }
            }
        }
        stage('Jar Build') {
            steps {
                dir('back-auth'){
```

```
                    sh 'chmod +x ./gradlew'
                    sh './gradlew clean bootJar'
                    sh 'pwd'
                }
            }
        }
        stage('Docker Build') {
            steps {
                script{
                    dir('back-auth') {
                        sh '''
                            docker build -t ${IMAGE_N
                            docker tag ${IMAGE_NAME}:
                        '''
                    }
                }
            }
        }
        stage('Push to ECR'){
            steps{
                script{
                    dir('back-auth'){
                        docker.withRegistry("https://
                            docker.image("${IMAGE_NAM
                            docker.image("${IMAGE_NAM
                        }
                    }
                }
            }

        }
        stage('deployment download'){
            steps{
                script{
                    withCredentials([file(credentials
                        sh 'cp $deployment ./deployme
                    }
                }
```

```
            }
        }

        stage('Deploy to k8s'){
            steps{
                script{
                    sh """
                        sed -i 's|latest|${BUILD_NUME
                        kubectl apply -f deployment.y
                    """

                }
            }
        }

        stage('Health Check') {
            steps {
                script {
                    def attempts = 10
                    def healthCheckPassed = false

                    for (int i = 0; i < attempts; i++
                        // curl을 사용하여 헬스 체크 수행
                        def response = sh script: "cu
                        if (response.contains("health
                            echo "Health check passed
                            healthCheckPassed = true
                            sh '''
                            curl -d '{"text":"## Back
                            '''
                            break
                        }
                        // Jenkins에서 슬립 함수 사용
                        sleep time: 1, unit: 'SECONDS
                    }

                    if (!healthCheckPassed) {
                        echo "Health check failed"
```

```
                        // Jenkins 파이프라인에서 에러 발
                        sh '''
                            curl -d '{"text":"## Back
                            '''
                        error("Deployment failed due
                    }
                }
            }
        }
    }
}
```

▼ 배포서버 예시 1 (rollout)

```
pipeline {
    agent any

    environment{
        REGION = 'ap-northeast-2'
        EKS_API = 'https://F73C5F6407E7C0DFD2AF34C773
        EKS_CLUSTER_NAME = 'mycluster'
        EKS_JENKINS_CREDENTIAL_ID = 'kubectl-credenti
        ECR_PATH = '654654554890.dkr.ecr.ap-northeast
        IMAGE_NAME = 'hellolaw-back-auth'
        AWS_CREDENTIAL_ID = 'aws-credential'

    }
    stages {
        stage('MMAlert-start') {
            steps {
                sh '''
                  curl -d '{"text":"## Back-Auth-Proc
                  '''
            }
        }

        stage('deployment download'){
            steps{
```

```
                script{
                    withCredentials([file(credentials
                        sh 'cp $deployment ./deployme
                    }
                }
            }
        }

        stage('Deploy to k8s'){
            steps{
                script{
                    sh """
                        kubectl apply -f deployment.y
                        kubectl rollout restart deplo

                    """

                }
            }
        }

        stage('Health Check') {
            steps {
                script {
                    def attempts = 10
                    def healthCheckPassed = false

                    for (int i = 0; i < attempts; i++
                        // curl을 사용하여 헬스 체크 수행
                        def response = sh script: "cu
                        if (response.contains("health
                            echo "Health check passed
                            healthCheckPassed = true
                            sh '''
                            curl -d '{"text":"## Back
                            '''
                            break
                        }
```

```
                        // Jenkins에서 슬립 함수 사용
                        sleep time: 1, unit: 'SECONDS
                    }

                    if (!healthCheckPassed) {
                        echo "Health check failed"
                        // Jenkins 파이프라인에서 에러 발
                        sh '''
                            curl -d '{"text":"## Back
                            '''
                        error("Deployment failed due
                    }
                }
            }
        }
    }
}
```

▼ 배포서버 예시 2 (blue-green)

```
pipeline {
    agent any

    environment{
        REGION = 'ap-northeast-2'
        EKS_API = 'https://F73C5F6407E7C0DFD2AF34C
773B41A24.gr7.ap-northeast-2.eks.amazonaws.com'
        EKS_CLUSTER_NAME = 'mycluster'
        EKS_JENKINS_CREDENTIAL_ID = 'kubectl-crede
ntial'
        ECR_PATH = '654654554890.dkr.ecr.ap-northe
ast-2.amazonaws.com'
        IMAGE_NAME = 'hellolaw-back-api'
        AWS_CREDENTIAL_ID = 'aws-credential'

    }
    stages {
        stage('MMAlert-start') {
```

```
            steps {
                sh '''
                  curl -d '{"text":"## Back-Api-Pr
od Deploy Start :anya1::anya1::anya1:   "}' -H "Co
ntent-Type: application/json" -X POST https://meet
ing.ssafy.com/hooks/ya5sm8fy4brz9eprbxxmghqu8e
                  '''
            }
        }

        stage('deployment download'){
            steps{
                script{
                    withCredentials([file(credenti
alsId: 'prod-back-api-blue', variable: 'deploymen
t')]) {
                        sh 'rm -rf blue-deploymen
t.yml'
                        sh 'cp $deployment blue-de
ployment.yml'
                    }
                    withCredentials([file(credenti
alsId: 'prod-back-api-green', variable: 'deploymen
t')]) {
                        sh 'rm -rf green-deploymen
t.yml'
                        sh 'cp $deployment green-d
eployment.yml'
                    }
                }
            }
        }
        stage('Determine Active Version') {
            steps {
                script {
                    // 파드의 현재 상태를 쿠버네티스에서
확인
                    env.ACTIVE_VERSION = sh(scrip
```

```
t: 'kubectl get service back-api-service -n produc
tion -o jsonpath="{.spec.selector.color}"', return
Stdout: true).trim()
                    env.TARGET_VERSION = env.ACTIV
E_VERSION == 'blue' ? 'green' : 'blue'
                }
            }
        }

        stage('Deploy to k8s'){
            steps{
                script{
                    sh """
                    kubectl apply -f ${TARGET_VERS
ION}-deployment.yml
                    PATCH_CONTENT=\$(cat ${ACTIVE_
VERSION}-${TARGET_VERSION}.yml)
                    kubectl patch svc back-api-ser
vice -n production -p "\${PATCH_CONTENT}"
                    """
                }
            }
        }
        stage('Health Check') {
            steps {
                script {
                    def attempts = 15
                    def healthCheckPassed = false

                    for (int i = 0; i < attempts;
i++) {
                        // curl을 사용하여 헬스 체크 수
행
                        def response = sh script:
"curl -s https://hellolaw.kr/api/health", returnSt
dout: true
                        if (response.contains("hea
lth")) {
```

```
                                echo "Health check pas
sed"
                                healthCheckPassed = tr
ue
                                sh '''
                                curl -d '{"text":"## B
ack-Api-Prod Deploy Success :anya_wakuwaku_2::anya
_wakuwaku_2::anya_wakuwaku_2:  "}' -H "Content-Typ
e: application/json" -X POST https://meeting.ssaf
y.com/hooks/ya5sm8fy4brz9eprbxxmghqu8e
                                '''
                                break
                            }
                            // Jenkins에서 슬립 함수 사용
                            sleep time: 1, unit: 'SECO
NDS'
                        }

                        if (!healthCheckPassed) {
                            echo "Health check failed"
                            // Jenkins 파이프라인에서 에러
발생시키기
                            sh '''
                                curl -d '{"text":"## B
ack-Api-Prod Deploy Failed :anya_crying::anya_cryi
ng::anya_crying:   "}' -H "Content-Type: applicati
on/json" -X POST https://meeting.ssafy.com/hooks/y
a5sm8fy4brz9eprbxxmghqu8e
                                '''
                            error("Deployment failed d
ue to health check failure.")
                        }
                    }
                }
            }
        }
    }
}
```

▼ TLS 적용

- ACM에서 구입한 도메인 인증받아야함 (Route 53 썼으면 자동으로 찾아준다)

1. ACM에 도메인 인증 요청 생성
2. DNS 관리 사이트 → CNAME 이름에서 도메인 앞부분을 호스트로, CNAME 값을 값/위치 항목에 쓰고 등록하기
3. 기다리면 인증 된다.
4. 발급된 ARN 주소를 Ingress에 입력하여 사용하기

- ingress yml에서

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: myapp-ingress
  namespace: default
  annotations:
    kubernetes.io/ingress.class: "alb"
    alb.ingress.kubernetes.io/scheme: internet-facing
    alb.ingress.kubernetes.io/target-type: ip
    alb.ingress.kubernetes.io/listen-ports: '[{"HTTPS":
443}]'
    alb.ingress.kubernetes.io/certificate-arn: <your-acm
-certificate-arn>
spec:
  rules:
  - host: myapp.example.com
    http:
```

```
      paths:
      - path: /
        pathType: Prefix
        backend:
          service:
            name: myservice
            port:
              number: 80
```

▼ OICP 생성

- **IAM OIDC provider**

```
eksctl utils associate-iam-oidc-provider \
    --region ap-northeast-2 \ # Your Region
    --cluster eks\ # Your Cluster Name
    --approve
```

- Policy 생성
  - policy 문서 다운로드

```
curl -o iam_policy.json https://raw.githubuserconten
t.com/kubernetes-sigs/aws-load-balancer-controller/ma
in/docs/install/iam_policy.json
```

  - policy 등록

```
aws iam create-policy --policy-name alb-controller-ia
m-policy --policy-document file://iam_policy.json
```

- ServiceAccount 생성

```
eksctl create iamserviceaccount --cluster {cluster_na
me} --namespace kube-system --name aws-load-balancer-
controller --attach-policy-arn arn:aws:iam::$ACCOUNT_
ID:policy/{policy_name} --override-existing-serviceac
counts --approve
```

```
eksctl create iamserviceaccount --cluster mycluster --namespace kube-system --name aws-load-balancer-controller --attach-policy-arn arn:aws:iam::skajd1:policy/alb-controller-iam-policy --override-existing-serviceaccounts --approve
```

▼ ALB Deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: aws-load-balancer-controller
  namespace: development # 개발서버
spec:
  replicas: 1
  selector:
    matchLabels:
      app: aws-load-balancer-controller
  template:
    metadata:
      labels:
        app: aws-load-balancer-controller
    spec:
      serviceAccountName: iamserviceaccount  # 이 서비스 계정은 development 네임스페이스에 있어야 함
      containers:
        - name: aws-load-balancer-controller
          image: amazon/aws-alb-ingress-controller:v2.3.1
          args:
            - --cluster-name=myclster
            - --ingress-class=alb
            - --watch-namespace=development  # 이 컨트롤러가 development 네임스페이스만 관찰하도록 설정
```

▼ 서비스어카운트 생성

- eksctl 생성

```
eksctl create iamserviceaccount --cluster mycluster --names
```

▼ db 연동

MYSQL

- 먼저 PVC 설정 해야한다 ! (도커의 볼륨 설정과 유사)

▼ EBS-CLI Driver(pvc 볼륨 자동 생성해주는 애)

- iam 생성

```
eksctl create iamserviceaccount \
    --name ebs-csi-controller-sa \
    --namespace kube-system \
    --cluster mycluster \
    --role-name AmazonEKS_EBS_CSI_DriverRole \
    --role-only \
    --attach-policy-arn arn:aws:iam::aws:policy/se
    --approve
```

- eksctl driver 설치

```
eksctl create addon --name aws-ebs-csi-driver --cl
```

▼ MySQL 매니피스트

▼ 개발서버 deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: mysql
  namespace: development
spec:
  replicas: 1
  selector:
    matchLabels:
```

```
      app: mysql
  template:
    metadata:
      labels:
        app: mysql
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExecut
            nodeSelectorTerms:
            - matchExpressions:
              - key: role
                operator: In
                values:
                - development
      containers:
      - name: mysql
        image: mysql:5.6
        env:
        - name: MYSQL_ROOT_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysql-secret
              key: password
        ports:
        - containerPort: 3306
        volumeMounts:
        - name: mysql-storage
          mountPath: /var/lib/mysql
        - name: initdb
          mountPath: /docker-entrypoint-initdb.d
      volumes:
      - name: mysql-storage
        persistentVolumeClaim:
          claimName: mysql-pvc
      - name: initdb
        configMap:
          name: mysql-initdb
```

```
---

apiVersion: v1
kind: Service
metadata:
  name: mysql-service
  namespace: development
spec:
  ports:
  - port: 3306
    targetPort: 3306
  selector:
    app: mysql

---


apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: mysql-pvc
  namespace: development
spec:
  accessModes:
    - ReadWriteOnce
  storageClassName: ebs-sc
  resources:
    requests:
      storage: 10Gi

---
apiVersion: v1
kind: Secret
metadata:
  name: mysql-secret
  namespace: development
type: Opaque
```

```
data:
  password: aGVsbG9sYXdfZGV2
```

▼ config

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: mysql-initdb
  namespace: development
data:
  init.sql: |
    CREATE DATABASE IF NOT EXISTS hellolaw CHARACTER

    CREATE USER 'hellolaw_dev'@'%' IDENTIFIED BY 'hel
    GRANT ALL PRIVILEGES ON hellolaw.* TO 'hellolaw_d
    FLUSH PRIVILEGES;
```

데이터베이스 생성할 때 인코딩 맞춰주자 꼭 !

여기서 mysql 5.7이 아니라, 5.6을 사용했는데, 5.7은 생성된 볼륨을 인식 못하는 버그가 있었다. 다운그레이드 하니까 해결 됐음! ㅋㅋ

REDIS

▼ Redis

▼ 개발서버 deployment

```
apiVersion: v1
kind: Secret
metadata:
  name: redis-secret
  namespace: development
type: Opaque
data:
  redis-password: aGVsbG9sYXdfZGV2  # 'hellolaw_dev'을
```

```
---

apiVersion: apps/v1
kind: Deployment
metadata:
  name: redis
  namespace: development
spec:
  selector:
    matchLabels:
      app: redis
  template:
    metadata:
      labels:
        app: redis
    spec:
      affinity:
        nodeAffinity:
          requiredDuringSchedulingIgnoredDuringExecut
            nodeSelectorTerms:
            - matchExpressions:
              - key: role
                operator: In
                values:
                - development
      containers:
      - name: redis
        image: redis:6.2.6
        env:
          - name: REDIS_PASSWORD
            valueFrom:
              secretKeyRef:
                name: redis-secret
                key: redis-password
        args: ["--requirepass", "$(REDIS_PASSWORD)"]
        ports:
        - containerPort: 6379
```

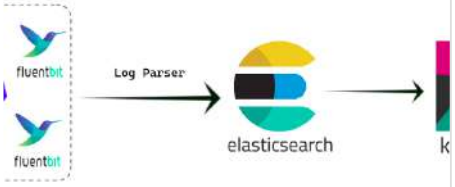
```
---

apiVersion: v1
kind: Service
metadata:
  name: redis-service
  namespace: development
spec:
  ports:
  - port: 6379
    targetPort: 6379
  selector:
    app: redis
```

▼ Fluentd 로 로깅관리

로그 수집을 위한 AWS EFK Stack 구축

로그 수집의 배경 쿠버네티스는 기본적으로 Pod가 정상상태가 아니라면 Pod를 kill하고 새로 생성한다. 하지만 운영자 입장에서는 Pod가 죽은 원인을 알아야 한다. 하지만, Pod가 죽으면 로그까지

https://devpoong.tistory.com/101



▼ 전체 리소스

```
NAMESPACE       NAME
READY   STATUS    RESTARTS   AGE
cert-manager   pod/cert-manager-cainjector-5c7c44654d-sz
244       1/1     Running   0          12d
cert-manager   pod/cert-manager-d7d7c546f-znf4b
1/1     Running   0          12d
cert-manager   pod/cert-manager-webhook-554cd5b9d5-kxlv2
1/1     Running   0          12d
development    pod/hellolaw-api-6f9c46c9cd-7zgp2
1/1     Running   0          3h34m
development    pod/hellolaw-auth-5884944877-xq7kp
1/1     Running   0          3h45m
```

```
development    pod/hellolaw-front-55c6577f97-vnkdz
1/1     Running   0          21h
development    pod/mysql-6b7487f75f-pw9pw
1/1     Running   0          25h
development    pod/redis-69f4db98d8-h7h54
1/1     Running   0          9d
kube-system    pod/aws-load-balancer-controller-76db544c
b-j8jpb   1/1     Running   0          9d
kube-system    pod/aws-node-mswmg
2/2     Running   0          13d
kube-system    pod/aws-node-txckq
2/2     Running   0          13d
kube-system    pod/coredns-f94fb47d9-m2h5c
1/1     Running   0          13d
kube-system    pod/coredns-f94fb47d9-t6trj
1/1     Running   0          13d
kube-system    pod/ebs-csi-controller-796cc8f5b5-4hmqx
6/6     Running   0          9d
kube-system    pod/ebs-csi-controller-796cc8f5b5-bxz85
6/6     Running   0          9d
kube-system    pod/ebs-csi-node-5r5bp
3/3     Running   0          9d
kube-system    pod/ebs-csi-node-zgmcg
3/3     Running   0          9d
kube-system    pod/kube-proxy-clqcb
1/1     Running   0          13d
kube-system    pod/kube-proxy-rshq8
1/1     Running   0          13d
production     pod/hellolaw-api-blue-647f85955-8925s
1/1     Running   0          33m
production     pod/hellolaw-api-blue-647f85955-s528h
1/1     Running   0          33m
production     pod/hellolaw-api-green-5968f77f4b-tfb92
1/1     Running   0          33m
production     pod/hellolaw-api-green-5968f77f4b-thlrh
1/1     Running   0          33m
production     pod/hellolaw-auth-74db5469fc-2rnsd
1/1     Running   0          13m
```

```
production     pod/hellolaw-front-75d464bc45-88hv4
1/1     Running   0          18h
production     pod/mysql-b7bfb574-xrclt
1/1     Running   0          5h1m
production     pod/redis-d9d9674cd-q467x
1/1     Running   0          5h31m

NAMESPACE      NAME
TYPE           CLUSTER-IP       EXTERNAL-IP
PORT(S)                  AGE
cert-manager   service/cert-manager
ClusterIP      10.100.168.143   <none>
9402/TCP                 12d
cert-manager   service/cert-manager-webhook
ClusterIP      10.100.92.228    <none>
443/TCP                  12d
default        service/kubernetes
ClusterIP      10.100.0.1       <none>
443/TCP                  13d
development    service/back-api-service
ClusterIP      10.100.55.27     <none>
8082/TCP                 9d
development    service/back-auth-service
ClusterIP      10.100.241.25    <none>
8099/TCP                 9d
development    service/mysql-service
LoadBalancer   10.100.1.126     a08f14ea73e2e4504b53f824
84df43e9-778954246.ap-northeast-2.elb.amazonaws.com    3
306:32599/TCP           9d
development    service/nginx-service
ClusterIP      10.100.111.20    <none>
80/TCP                   9d
development    service/redis-service
ClusterIP      10.100.1.162     <none>
6379/TCP                 9d
kube-system    service/aws-load-balancer-webhook-service
ClusterIP      10.100.41.136    <none>
443/TCP                  10d
```

```
kube-system    service/kube-dns
ClusterIP      10.100.0.10      <none>
53/UDP,53/TCP,9153/TCP   13d
logging        service/elasticsearch-svc
ClusterIP      10.100.48.220    <none>
9200/TCP,9300/TCP        4d20h
production     service/back-api-service
ClusterIP      10.100.253.234   <none>
8082/TCP                 47m
production     service/back-auth-service
ClusterIP      10.100.241.179   <none>
8099/TCP                 18h
production     service/mysql-service
LoadBalancer   10.100.35.186    a2aa13d3d99e34db5a6fce13
7bb0692c-1011795548.ap-northeast-2.elb.amazonaws.com   3
306:31157/TCP           21h
production     service/nginx-service
ClusterIP      10.100.200.55    <none>
80/TCP                   27h
production     service/redis-service
ClusterIP      10.100.185.219   <none>
6379/TCP                 25h

NAMESPACE     NAME                                    DESI
RED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SE
LECTOR              AGE
kube-system   daemonset.apps/aws-node                 2
2         2       2            2           <none>
13d
kube-system   daemonset.apps/ebs-csi-node             2
2         2       2            2           kubernetes.i
o/os=linux     9d
kube-system   daemonset.apps/ebs-csi-node-windows     0
0         0       0            0           kubernetes.i
o/os=windows   9d
kube-system   daemonset.apps/kube-proxy               2
2         2       2            2           <none>
13d
```

```
NAMESPACE      NAME
READY   UP-TO-DATE   AVAILABLE   AGE
cert-manager   deployment.apps/cert-manager
1/1     1            1           12d
cert-manager   deployment.apps/cert-manager-cainjector
1/1     1            1           12d
cert-manager   deployment.apps/cert-manager-webhook
1/1     1            1           12d
development    deployment.apps/hellolaw-api
1/1     1            1           22h
development    deployment.apps/hellolaw-auth
1/1     1            1           6d5h
development    deployment.apps/hellolaw-front
1/1     1            1           13d
development    deployment.apps/mysql
1/1     1            1           25h
development    deployment.apps/redis
1/1     1            1           9d
kube-system    deployment.apps/aws-load-balancer-control
ler   1/1     1            1           9d
kube-system    deployment.apps/coredns
2/2     2            2           13d
kube-system    deployment.apps/ebs-csi-controller
2/2     2            2           9d
production     deployment.apps/hellolaw-api-blue
2/2     2            2           33m
production     deployment.apps/hellolaw-api-green
2/2     2            2           33m
production     deployment.apps/hellolaw-auth
1/1     1            1           18h
production     deployment.apps/hellolaw-front
1/1     1            1           27h
production     deployment.apps/mysql
1/1     1            1           5h1m
production     deployment.apps/redis
1/1     1            1           5h31m
```

```
NAMESPACE      NAME
DESIRED   CURRENT   READY   AGE
cert-manager   replicaset.apps/cert-manager-cainjector-5
c7c44654d       1         1         1       12d
cert-manager   replicaset.apps/cert-manager-d7d7c546f
1         1         1       12d
cert-manager   replicaset.apps/cert-manager-webhook-554c
d5b9d5          1         1         1       12d
development    replicaset.apps/hellolaw-api-6f9c46c9cd
1         1         1       3h34m
development    replicaset.apps/hellolaw-auth-5884944877
1         1         1       3h45m
development    replicaset.apps/hellolaw-front-55c6577f97
1         1         1       21h
development    replicaset.apps/mysql-6b7487f75f
1         1         1       25h
development    replicaset.apps/redis-69f4db98d8
1         1         1       9d
kube-system    replicaset.apps/aws-load-balancer-control
ler-76db544cb   1         1         1       9d
kube-system    replicaset.apps/coredns-f94fb47d9
2         2         2       13d
kube-system    replicaset.apps/ebs-csi-controller-796cc8
f5b5            2         2         2       9d
production     replicaset.apps/hellolaw-api-blue-647f859
55              2         2         2       33m
production     replicaset.apps/hellolaw-api-green-5968f7
7f4b            2         2         2       33m
production     replicaset.apps/hellolaw-auth-676b5658f7
0         0         0       3h51m
production     replicaset.apps/hellolaw-auth-6f94466657
0         0         0       3h49m
production     replicaset.apps/hellolaw-auth-74db5469fc
1         1         1       13m
production     replicaset.apps/hellolaw-front-56456948b
0         0         0       18h
production     replicaset.apps/hellolaw-front-75d464bc45
1         1         1       18h
```

```
production     replicaset.apps/hellolaw-front-7667ff674d
0         0         0       27h
production     replicaset.apps/mysql-b7bfb574
1         1         1       5h1m
production     replicaset.apps/redis-d9d9674cd
1         1         1       5h31m
```