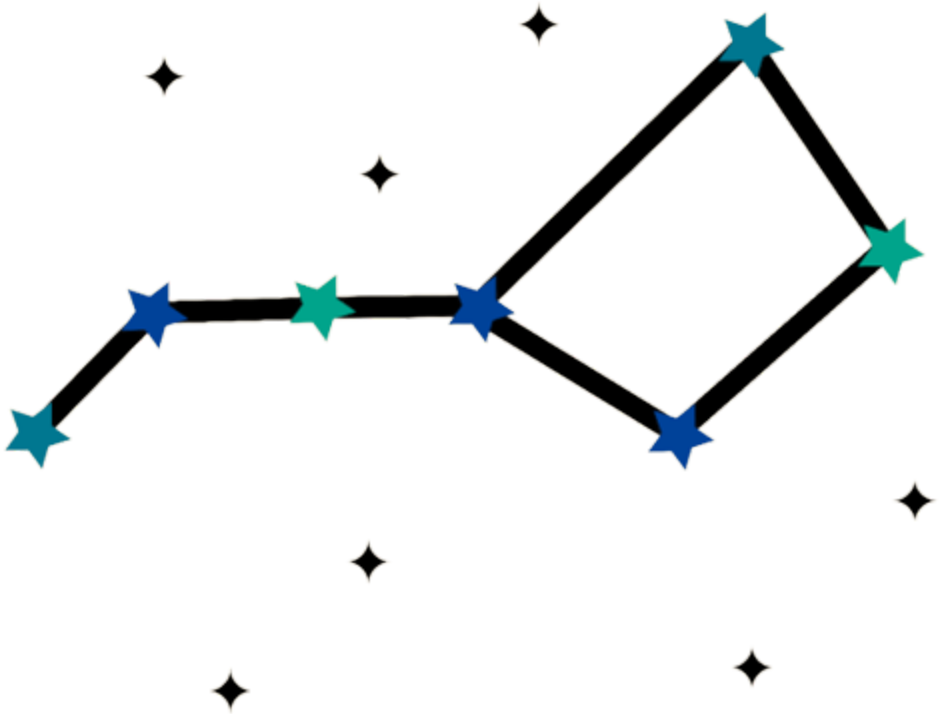


Constelink

PORTING MANUAL

목 차

I. 개발환경

1. 프로젝트 기술 스택

Server : AWS EC2 Ubuntu 20.04 LTS

Visual Studio Code : 1.75.1

IntelliJ IDEA : 2022.3.1 (Ultimate Edition) 17.0.5+1-b653.23 amd64

JVM : OpenJDK 17

Spring Boot: 3.0.4

Gradle: 7.6.1

gRPC: 1.52.1

Node.js : 18.15.0

TypeScript: 4.9.5

React: 18.2.0

Redux: 1.9.3

MariaDB : 10.11.2

Redis : 7.0.10

Kubernetes: 1.26.2

CRI-O: 1.26.1

Nginx Ingress Controller: v1.6.4

Jenkins : 2.397

ArgoCD: v2.6.7+5bcd846

2. 설정 파일 목록과 프로젝트내 경로

공통:

- **Jenkinsfile :** /

Frontend:

- **Dockerfile :** /Frontend
- **.env :** /Frontend

AuthServer:

- **Dockerfile :** /Backend/AuthServer
- **application.yml :** /Backend/AuthServer/src/main/resources

ConstelinkBeneficiary:

- **Dockerfile :** /Backend/ConstelinkBeneficiary
- **application.yml :** /Backend/ConstelinkBeneficiary/src/main/resources

ConstelinkFundraising:

- **Dockerfile :** /Backend/ConstelinkFundraising
- **application.yml :** /Backend/ConstelinkFundraising/src/main/resources

ConstelinkMember:

- **Dockerfile :** /Backend/ConstelinkMember
- **application.yml :** /Backend/ConstelinkMember/src/main/resources

ConstelinkNotice:

- **Dockerfile :** /Backend/ConstelinkNotice
- **application.yml :** /Backend/ConstelinkNotice/src/main/resources

ConstelinkFile:

- **Dockerfile :** /Backend/ConstelinkFile
- **application.yml :** /Backend/ConstelinkFile/src/main/resources

3. Kubernetes Manifest

jenkins-deployment.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: jenkins
spec:
  replicas: 1
  selector:
    matchLabels:
      app: jenkins
  template:
    metadata:
      labels:
        app: jenkins
    spec:
      securityContext:
        fsGroup: 0
        runAsUser: 0
      containers:
      - name: jenkins
        image: jenkins/jenkins:jdk17
        securityContext:
          privileged: true
        env:
        - name: TZ
          value: Asia/Seoul
        ports:
        - containerPort: 8080
        - containerPort: 50000
        volumeMounts:
        - name: jenkins-home
          mountPath: /var/jenkins_home
      nodeSelector:
        node-role.kubernetes.io/control-plane: ""
      volumes:
```

```
      - name: jenkins-home
        hostPath:
          path: /var/jenkins_home
          type: Directory
```

ingress-nginx.yaml:

```
curl -o ingress-nginx.yaml
https://raw.githubusercontent.com/kubernetes/ingress-nginx/controller-v1.6.
4/deploy/static/provider/baremetal/deploy.yaml

# NodePort에 80, 443 포트 할당
vi ingress-nginx.yaml
```

```
# Service 부분에 nodePort 추가
~~~
ports:
  - appProtocol: http
    name: http
    port: 80
    protocol: TCP
    targetPort: http
    nodePort: 80
  - appProtocol: https
    name: https
    port: 443
    protocol: TCP
    targetPort: https
    nodePort: 443
~~~

# 마스터노드에 생성하려면 nodeSelector에 다음 내용 추가
~~~
spec:
  nodeSelector:
    node-role.kubernetes.io/control-plane: ""
~~~
```

jenkins-service.yaml:

```yaml
apiVersion: v1
kind: Service
metadata:
  name: jenkins-service
spec:
  selector:
    app: jenkins
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 8080
      nodePort: 8093
  type: NodePort

---

apiVersion: v1
kind: Service
metadata:
  name: jenkins-jnlp
spec:
  selector:
    app: jenkins
  ports:
    - protocol: TCP
      port: 50000
      targetPort: 50000
      nodePort: 50000
  type: NodePort
```

mariadb-beneficiary.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: mariadb-beneficiary
spec:
  replicas: 1
```

```yaml
  selector:
    matchLabels:
      app: mariadb-beneficiary
  template:
    metadata:
      labels:
        app: mariadb-beneficiary
    spec:
      nodeSelector:
        node-role.kubernetes.io/control-plane: ""
      containers:
      - name: mariadb
        image: mariadb:latest
        env:
        - name: MYSQL_ROOT_PASSWORD
          value: "루트 비밀번호"
        - name: MYSQL_USER
          value: "유저 이름"
        - name: MYSQL_PASSWORD
          value: "유저 비밀번호"
        - name: MYSQL_USER_HOST
          value: "%"
        ports:
        - containerPort: 3306
        volumeMounts:
        - name: mariadb-data
          mountPath: /var/lib/mysql
      volumes:
      - name: mariadb-data
        hostPath:
          path: /home/ubuntu/mariadb/databases-beneficiary
          type: Directory
---
apiVersion: v1
kind: Service
metadata:
  name: mariadb-beneficiary
spec:
  selector:
    app: mariadb-beneficiary
  ports:
    - protocol: TCP
```

```
      port: 3306
      targetPort: 3306
      nodePort: 3325
  type: NodePort
```

mariadb-fundraising.yaml:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: mariadb-fundraising
spec:
  replicas: 1
  selector:
    matchLabels:
      app: mariadb-fundraising
  template:
    metadata:
      labels:
        app: mariadb-fundraising
    spec:
      nodeSelector:
        node-role.kubernetes.io/control-plane: ""
      containers:
      - name: mariadb-fundraising
        image: mariadb:latest
        env:
        - name: MYSQL_ROOT_PASSWORD
          value: "루트 비밀번호"
        - name: MYSQL_USER
          value: "유저 이름"
        - name: MYSQL_PASSWORD
          value: "유저 비밀번호"
        - name: MYSQL_USER_HOST
          value: "%"
        ports:
        - containerPort: 3306
        volumeMounts:
        - name: mariadb-data
          mountPath: /var/lib/mysql
```

```yaml
      volumes:
      - name: mariadb-data
        hostPath:
          path: /home/ubuntu/mariadb/databases-fundraising
          type: Directory
---
apiVersion: v1
kind: Service
metadata:
  name: mariadb-fundraising
spec:
  selector:
    app: mariadb-fundraising
  ports:
    - protocol: TCP
      port: 3306
      targetPort: 3306
      nodePort: 3326
  type: NodePort
```

mariadb-member.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: mariadb-member
spec:
  replicas: 1
  selector:
    matchLabels:
      app: mariadb-member
  template:
    metadata:
      labels:
        app: mariadb-member
    spec:
      nodeSelector:
        node-role.kubernetes.io/control-plane: ""
      containers:
      - name: mariadb-member
```

```yaml
        image: mariadb:latest
        env:
        - name: MYSQL_ROOT_PASSWORD
          value: "루트 비밀번호"
        - name: MYSQL_USER
          value: "유저 이름"
        - name: MYSQL_PASSWORD
          value: "유저 비밀번호"
        - name: MYSQL_USER_HOST
          value: "%"
        ports:
        - containerPort: 3306
        volumeMounts:
        - name: mariadb-data
          mountPath: /var/lib/mysql
      volumes:
      - name: mariadb-data
        hostPath:
          path: /home/ubuntu/mariadb/databases-member
          type: Directory
---
apiVersion: v1
kind: Service
metadata:
  name: mariadb-member
spec:
  selector:
    app: mariadb-member
  ports:
    - protocol: TCP
      port: 3306
      targetPort: 3306
      nodePort: 3324
  type: NodePort
```

mariadb-notice.yaml:

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

```yaml
  name: mariadb-notice
spec:
  replicas: 1
  selector:
    matchLabels:
      app: mariadb-notice
  template:
    metadata:
      labels:
        app: mariadb-notice
    spec:
      nodeSelector:
        node-role.kubernetes.io/control-plane: ""
      containers:
      - name: mariadb-notice
        image: mariadb:latest
        env:
        - name: MYSQL_ROOT_PASSWORD
          value: "루트 비밀번호"
        - name: MYSQL_USER
          value: "유저 이름"
        - name: MYSQL_PASSWORD
          value: "유저 비밀번호"
        - name: MYSQL_USER_HOST
          value: "%"
        ports:
        - containerPort: 3306
        volumeMounts:
        - name: mariadb-data
          mountPath: /var/lib/mysql
      volumes:
      - name: mariadb-data
        hostPath:
          path: /home/ubuntu/mariadb/databases-notice
          type: Directory
---
apiVersion: v1
kind: Service
metadata:
  name: mariadb-notice
spec:
  selector:
```

```
    app: mariadb-notice
  ports:
    - protocol: TCP
      port: 3306
      targetPort: 3306
      nodePort: 3327
  type: NodePort
```

redis.yaml:

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: redis
spec:
  replicas: 1
  selector:
    matchLabels:
      app: redis
  template:
    metadata:
      labels:
        app: redis
    spec:
      nodeSelector:
        node-role.kubernetes.io/control-plane: ""
      containers:
      - name: redis
        image: redis:latest
        args: ["--requirepass", "비밀번호"]
        ports:
        - containerPort: 6379
        volumeMounts:
        - name: redis-data
          mountPath: /data
      volumes:
      - name: redis-data
        hostPath:
          path: /home/ubuntu/redis/data
          type: Directory
```

```yaml
---
apiVersion: v1
kind: Service
metadata:
  name: redis
spec:
  selector:
    app: redis
  ports:
    - protocol: TCP
      port: 6379
      targetPort: 6379
      nodePort: 6379
  type: NodePort
```

constelink-front.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: frontend
  namespace: default
spec:
  replicas: 1
  revisionHistoryLimit: 2
  selector:
    matchLabels:
      app: frontend
  template:
    metadata:
      labels:
        app: frontend
    spec:
      containers:
      - name: frontend
        image: docker.io/sadoruin/constelink-front:v1
        ports:
        - containerPort: 3000
---
apiVersion: v1
```

```yaml
kind: Service
metadata:
  name: frontend
  namespace: default
spec:
  selector:
    app: frontend
  ports:
    - protocol: TCP
      port: 3000
      targetPort: 3000
  type: ClusterIP
```

constelink-authserver.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: constelink-authserver
  namespace: default
spec:
  replicas: 1
  revisionHistoryLimit: 2
  selector:
    matchLabels:
      app: constelink-authserver
  template:
    metadata:
      labels:
        app: constelink-authserver
    spec:
      containers:
      - name: constelink-authserver
        image: docker.io/sadoruin/constelink-authserver:v1
        ports:
        - containerPort: 8080
---
apiVersion: v1
kind: Service
metadata:
```

```yaml
  name: constelink-authserver
  namespace: default
spec:
  selector:
    app: constelink-authserver
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 8080
  type: ClusterIP
```

constelink-beneficiary.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: constelink-beneficiary
  namespace: default
spec:
  replicas: 1
  revisionHistoryLimit: 2
  selector:
    matchLabels:
      app: constelink-beneficiary
  template:
    metadata:
      labels:
        app: constelink-beneficiary
    spec:
      containers:
      - name: constelink-beneficiary
        image: docker.io/sadoruin/constelink-beneficiary:v1
        ports:
        - containerPort: 8080
        - containerPort: 9090
---
apiVersion: v1
kind: Service
metadata:
  name: constelink-beneficiary
```

```yaml
  namespace: default
spec:
  selector:
    app: constelink-beneficiary
  ports:
    - name: springboot
      protocol: TCP
      port: 8080
      targetPort: 8080
    - name: grpc
      protocol: TCP
      port: 9090
      targetPort: 9090
  type: ClusterIP
```

constelink-file.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: constelink-file
  namespace: default
spec:
  replicas: 1
  revisionHistoryLimit: 2
  selector:
    matchLabels:
      app: constelink-file
  template:
    metadata:
      labels:
        app: constelink-file
    spec:
      containers:
      - name: constelink-file
        image: docker.io/sadoruin/constelink-file:v1
        ports:
        - containerPort: 8080
---
apiVersion: v1
```

```yaml
kind: Service
metadata:
  name: constelink-file
  namespace: default
spec:
  selector:
    app: constelink-file
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 8080
  type: ClusterIP
```

constelink-fundraising.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: constelink-fundraising
  namespace: default
spec:
  replicas: 1
  revisionHistoryLimit: 2
  selector:
    matchLabels:
      app: constelink-fundraising
  template:
    metadata:
      labels:
        app: constelink-fundraising
    spec:
      containers:
      - name: constelink-fundraising
        image: docker.io/sadoruin/constelink-fundraising:v1
        ports:
        - containerPort: 8080
---
apiVersion: v1
kind: Service
metadata:
```

```yaml
  name: constelink-fundraising
  namespace: default
spec:
  selector:
    app: constelink-fundraising
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 8080
  type: ClusterIP
```

constelink-member.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: constelink-member
  namespace: default
spec:
  replicas: 1
  revisionHistoryLimit: 2
  selector:
    matchLabels:
      app: constelink-member
  template:
    metadata:
      labels:
        app: constelink-member
    spec:
      containers:
      - name: constelink-member
        image: docker.io/sadoruin/constelink-member:v1
        ports:
        - containerPort: 8080
---
apiVersion: v1
kind: Service
metadata:
  name: constelink-member
  namespace: default
```

```yaml
spec:
  selector:
    app: constelink-member
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 8080
  type: ClusterIP
```

constelink-notice.yaml:

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: constelink-notice
  namespace: default
spec:
  replicas: 1
  revisionHistoryLimit: 2
  selector:
    matchLabels:
      app: constelink-notice
  template:
    metadata:
      labels:
        app: constelink-notice
    spec:
      containers:
      - name: constelink-notice
        image: docker.io/sadoruin/constelink-notice:v1
        ports:
        - containerPort: 8080
---
apiVersion: v1
kind: Service
metadata:
  name: constelink-notice
  namespace: default
spec:
  selector:
```

```
    app: constelink-notice
  ports:
    - protocol: TCP
      port: 8080
      targetPort: 8080
  type: ClusterIP
```

4. 설정 파일 및 환경 변수 정보

공통:

- **Jenkinsfile :**

```
pipeline {
    agent any

    tools {
        nodejs "nodejs"
    }

    stages {
        stage('Project Build') {
            steps {
                script {
                    if(env.BRANCH_NAME == 'dev-front') {
                        echo "Front Project Build Step"
                    } else if(env.BRANCH_NAME ==
'feature-back/auth-server') {
                        echo "Auth Server Project Build Step"
                        dir('Backend/AuthServer') {
                            sh 'chmod +x gradlew'
                            sh './gradlew clean build -x test'
                        }
                    } else if(env.BRANCH_NAME == 'feature-back/member') {
                        echo "ConstelinkMember Project Build Step"
                        dir('Backend/ConstelinkMember') {
                            sh 'chmod +x gradlew'
                            sh './gradlew clean build -x test'
                        }
                    } else if(env.BRANCH_NAME ==
```

```
'feature-back/beneficiary') {
                        echo "ConstelinkBeneficiary Project Build Step"
                        dir('Backend/ConstelinkBeneficiary') {
                            sh 'chmod +x gradlew'
                            sh './gradlew clean build -x test'
                        }
                    } else if(env.BRANCH_NAME ==
'feature-back/fundraising') {
                        echo "ConstelinkFundraising Project Build Step"
                        dir('Backend/ConstelinkFundraising') {
                            sh 'chmod +x gradlew'
                            sh './gradlew clean build -x test'
                        }
                    } else if(env.BRANCH_NAME == 'feature-back/file') {
                        echo "ConstelinkFile Project Build Step"
                        dir('Backend/ConstelinkFile') {
                            sh 'chmod +x gradlew'
                            sh './gradlew clean build -x test'
                        }
                    } else if(env.BRANCH_NAME == 'feature-back/notice') {
                        echo "ConstelinkNotice Project Build Step"
                        dir('Backend/ConstelinkNotice') {
                            sh 'chmod +x gradlew'
                            sh './gradlew clean build -x test'
                        }
                    }
                }
            }
        }
        stage('Image Build') {
            environment {
                PATH = "/busybox:/kaniko:$PATH"
            }
            steps {
                script {
                    podTemplate(yaml: """
                      kind: Pod
                      metadata:
                        name: kaniko
                      spec:
                        containers:
                        - name: kaniko
```

```
                            image: gcr.io/kaniko-project/executor:debug
                            imagePullPolicy: Always
                            command:
                            - sleep
                            args:
                            - 99d
                            volumeMounts:
                            - name: shared-workspace
                              mountPath: /workspace
                            - name: docker-config
                              mountPath: /kaniko/.docker
                            tty: true
                          nodeSelector:
                            node-role.kubernetes.io/control-plane: ""
                          volumes:
                          - name: shared-workspace
                            hostPath:
                              path: ${WORKSPACE}
                              type: Directory
                          - name: docker-config
                            secret:
                              secretName: regcred
                              items:
                              - key: .dockerconfigjson
                                path: config.json
                          """) {
                          node(POD_LABEL) {
                              container(name: 'kaniko', shell: '/busybox/sh')
{
                                  if(env.BRANCH_NAME == 'dev-front') {
                                      echo "Front Image Build Step"
                                      sh """#!/busybox/sh
                                      /kaniko/executor
--context=/workspace/Frontend --dockerfile=/workspace/Frontend/Dockerfile
--destination=sadoruin/constelink-front:${env.BUILD_NUMBER}
                                      """
                                  } else if(env.BRANCH_NAME ==
'feature-back/auth-server') {
                                      echo "Auth Server Image Build Step"
                                      sh """#!/busybox/sh
                                      /kaniko/executor
--context=/workspace/Backend/AuthServer
```

```
--dockerfile=/workspace/Backend/AuthServer/Dockerfile
--destination=sadoruin/constelink-authserver:${env.BUILD_NUMBER}
                                    """
                                } else if(env.BRANCH_NAME ==
'feature-back/member') {
                                    echo "ConstelinkMember Image Build
Step"
                                    sh """#!/busybox/sh
                                    /kaniko/executor
--context=/workspace/Backend/ConstelinkMember
--dockerfile=/workspace/Backend/ConstelinkMember/Dockerfile
--destination=sadoruin/constelink-member:${env.BUILD_NUMBER}
                                    """
                                } else if(env.BRANCH_NAME ==
'feature-back/beneficiary') {
                                    echo "ConstelinkBeneficiary Image Build
Step"
                                    sh """#!/busybox/sh
                                    /kaniko/executor
--context=/workspace/Backend/ConstelinkBeneficiary
--dockerfile=/workspace/Backend/ConstelinkBeneficiary/Dockerfile
--destination=sadoruin/constelink-beneficiary:${env.BUILD_NUMBER}
                                    """
                                } else if(env.BRANCH_NAME ==
'feature-back/fundraising') {
                                    echo "ConstelinkFundraising Image Build
Step"
                                    sh """#!/busybox/sh
                                    /kaniko/executor
--context=/workspace/Backend/ConstelinkFundraising
--dockerfile=/workspace/Backend/ConstelinkFundraising/Dockerfile
--destination=sadoruin/constelink-fundraising:${env.BUILD_NUMBER}
                                    """
                                } else if(env.BRANCH_NAME ==
'feature-back/file') {
                                    echo "ConstelinkFile Image Build Step"
                                    sh """#!/busybox/sh
                                    /kaniko/executor
--context=/workspace/Backend/ConstelinkFile
--dockerfile=/workspace/Backend/ConstelinkFile/Dockerfile
--destination=sadoruin/constelink-file:${env.BUILD_NUMBER}
                                    """
```

```
                                } else if(env.BRANCH_NAME ==
'feature-back/notice') {
                                    echo "ConstelinkNotice Image Build
Step"
                                    sh """#!/busybox/sh
                                    /kaniko/executor
--context=/workspace/Backend/ConstelinkNotice
--dockerfile=/workspace/Backend/ConstelinkNotice/Dockerfile
--destination=sadoruin/constelink-notice:${env.BUILD_NUMBER}
                                    """
                                }
                            }
                        }
                    }
                }
            }
        }
        stage('Deploy') {
            steps {
                script {
                    dir('/git') {
                        git branch: 'main',
                            credentialsId: 'gitlab-account',
                            url: 'Manifest 레포지토리 주소'
                        sh 'git config --global user.email "이메일"'
                        sh 'git config --global user.name "이름"'

                        if(env.BRANCH_NAME == 'dev-front') {
                            echo "Front Deploy Step"
                            sh """
                                sed -i
's/constelink-front:\\([^:]*\\)/constelink-front:${env.BUILD_NUMBER}/g'
manifests/constelink-front.yaml
                                git add manifests/constelink-front.yaml
                                git commit -m 'Update constelink-front tag
to ${env.BUILD_NUMBER}'
                            """
                        } else if(env.BRANCH_NAME ==
'feature-back/auth-server') {
                            echo "Auth Server Deploy Step"
                            sh """
                                sed -i
```

```
's/constelink-authserver:\\([^:]*\\)/constelink-authserver:${env.BUILD_NUMB
ER}/g' manifests/constelink-authserver.yaml
                                    git add
manifests/constelink-authserver.yaml
                                    git commit -m 'Update constelink-authserver
tag to ${env.BUILD_NUMBER}'
                                """
                            } else if(env.BRANCH_NAME == 'feature-back/member')
{
                                echo "ConstelinkMember Deploy Step"
                                sh """
                                    sed -i
's/constelink-member:\\([^:]*\\)/constelink-member:${env.BUILD_NUMBER}/g'
manifests/constelink-member.yaml
                                    git add manifests/constelink-member.yaml
                                    git commit -m 'Update constelink-member tag
to ${env.BUILD_NUMBER}'
                                """
                            } else if(env.BRANCH_NAME ==
'feature-back/beneficiary') {
                                echo "ConstelinkBeneficiary Deploy Step"
                                sh """
                                    sed -i
's/constelink-beneficiary:\\([^:]*\\)/constelink-beneficiary:${env.BUILD_NU
MBER}/g' manifests/constelink-beneficiary.yaml
                                    git add
manifests/constelink-beneficiary.yaml
                                    git commit -m 'Update
constelink-beneficiary tag to ${env.BUILD_NUMBER}'
                                """
                            } else if(env.BRANCH_NAME ==
'feature-back/fundraising') {
                                echo "ConstelinkFundraising Deploy Step"
                                sh """
                                    sed -i
's/constelink-fundraising:\\([^:]*\\)/constelink-fundraising:${env.BUILD_NU
MBER}/g' manifests/constelink-fundraising.yaml
                                    git add
manifests/constelink-fundraising.yaml
                                    git commit -m 'Update
constelink-fundraising tag to ${env.BUILD_NUMBER}'
                                """
```

```
                        } else if(env.BRANCH_NAME == 'feature-back/file') {
                            echo "ConstelinkFile Deploy Step"
                            sh """
                                sed -i
's/constelink-file:\\([^:]*\\)/constelink-file:${env.BUILD_NUMBER}/g'
manifests/constelink-file.yaml
                                git add manifests/constelink-file.yaml
                                git commit -m 'Update constelink-file tag
to ${env.BUILD_NUMBER}'
                            """
                        } else if(env.BRANCH_NAME == 'feature-back/notice')
{
                            echo "ConstelinkNotice Deploy Step"
                            sh """
                                sed -i
's/constelink-notice:\\([^:]*\\)/constelink-notice:${env.BUILD_NUMBER}/g'
manifests/constelink-notice.yaml
                                git add manifests/constelink-notice.yaml
                                git commit -m 'Update constelink-notice tag
to ${env.BUILD_NUMBER}'
                            """
                        }

                        withCredentials([usernamePassword(credentialsId:
'gitlab-account', passwordVariable: 'GIT_PASSWORD', usernameVariable:
'GIT_USERNAME')]) {
                            sh 'git remote set-url origin
https://$GIT_USERNAME:$GIT_PASSWORD@레포지토리주소'
                            sh 'git push origin main'
                        }
                    }

                }
            }
        }
    }
}
```

Frontend:

- **Dockerfile :**

```
FROM node:18.15-alpine
WORKDIR /app
COPY ./package* ./
RUN npm install
COPY ./ ./
EXPOSE 3000
CMD ["npm", "run", "start"]
```

- **.env :**

```
REACT_APP_MM_PRIVATE_KEY="MetaMask 컨트랙트 계정 Private Key"
WDS_SOCKET_PORT=0
```

AuthServer:

- **Dockerfile :**

```
FROM openjdk:17-jdk-slim
ARG JAR_FILE=build/libs/*.jar
COPY ${JAR_FILE} app.jar
EXPOSE 8080
ENTRYPOINT ["java", "-jar", "-Duser.timezone=Asia/Seoul", "app.jar"]
```

- **application.yml :**

```
spring:
  data:
    redis:
      host: redis
      port: 6379
      password: 비밀번호

jwt:
  secret: 비밀키값
```

ConstelinkBeneficiary:

- **Dockerfile :**

```
FROM openjdk:17-jdk-slim
ARG JAR_FILE=build/libs/*.jar
COPY ${JAR_FILE} app.jar
EXPOSE 8080 9090
ENTRYPOINT ["java", "-jar", "-Duser.timezone=Asia/Seoul", "app.jar"]
```

- **application.yml :**

```
spring:
  datasource:
    url: jdbc:mariadb://mariadb-beneficiary:3306/constelink_beneficiary
    driver-class-name: org.mariadb.jdbc.Driver
    username: 계정명
    password: 비밀번호
  jpa:
    open-in-view: false
    generate-ddl: true
    show-sql: true
    hibernate:
      ddl-auto: none
```

ConstelinkFundraising:

- **Dockerfile :**

```
FROM openjdk:17-jdk-slim
ARG JAR_FILE=build/libs/*.jar
COPY ${JAR_FILE} app.jar
EXPOSE 8080
ENTRYPOINT ["java", "-jar", "-Duser.timezone=Asia/Seoul", "app.jar"]
```

- **application.yml :**

```yaml
spring:
  datasource:
    url: jdbc:mariadb://mariadb-fundraising:3306/constelink_fundraising
    driver-class-name: org.mariadb.jdbc.Driver
    username: 계정명
    password: 비밀번호
  jpa:
    open-in-view: false
    generate-ddl: true
    show-sql: true
    hibernate:
      ddl-auto: none
```

ConstelinkMember:

- **Dockerfile :**

```dockerfile
FROM openjdk:17-jdk-slim
ARG JAR_FILE=build/libs/*.jar
COPY ${JAR_FILE} app.jar
EXPOSE 8080
ENTRYPOINT ["java", "-jar", "-Duser.timezone=Asia/Seoul", "app.jar"]
```

- **application.yml :**

```yaml
springdoc:
  version: v1.0.0
  api-docs:
    path: /api-docs
  default-consumes-media-type: application/json
  default-produces-media-type: application/json
  swagger-ui:
    operations-sorter: alpha
    tags-sorter: alpha
    path: /swagger-ui.html
    disable-swagger-default-url: true
    display-query-params-without-oauth2: true
```

```yaml
spring:
  data:
    redis:
      host: redis
      port: 6379
      password: 비밀번호

  datasource:
    url: jdbc:mariadb://mariadb-member:3306/constelink_member
    username: 계정명
    password: 비밀번호
    driver-class-name: org.mariadb.jdbc.Driver
  jpa:
    hibernate:
      ddl-auto: none
    properties:
      hibernate:
        show_sql: true
        format_sql: true
        default_batch_fetch_size: 100

  security:
    oauth2:
      client:
        registration:
          google: # /oauth2/authorization/google  SpringSecurity OAuthLogin
Request Path
            client-id: 클라이언트키
            client-secret: 비밀키값
            redirect-uri:
https://j8a206.p.ssafy.io/member/oauth2/callback/google
            scope:
              - email
              - profile

            # SpringSecurity doesn't provide KAKAO OAuth2 Login
            # add Provider to use KAKAO OAuth2 Login on SpringSecurity
          kakao:
            client-id: 클라이언트키
            redirect-uri: https://도메인/member/oauth2/callback/kakao
            client-authentication-method: POST
```

```
            authorization-grant-type: authorization_code
            scope:
              - profile_nickname
              - profile_image
              - account_email
            client_name: kakao

        provider:
          kakao:
            authorization-uri: https://kauth.kakao.com/oauth/authorize
            token-uri: https://kauth.kakao.com/oauth/token
            user-info-uri: https://kapi.kakao.com/v2/user/me
            user-name-attribute: id

server:
  port: 8080

logging:
  level:
    root: INFO

jwt:
  secret: 비밀키값
  access: 1800
  refresh: 604800

kakao:
  admin:
    key: 클라이언트키
  base:
    fail-url: https://j8a206.p.ssafy.io/kakaoFail
    cancel-url: https://j8a206.p.ssafy.io/kakaoFail
    success-url: https://j8a206.p.ssafy.io/kakao

login:
    redirect-url: https://j8a206.p.ssafy.io/login
```

ConstelinkNotice:

- **Dockerfile :**

```
FROM openjdk:17-jdk-slim
ARG JAR_FILE=build/libs/*.jar
COPY ${JAR_FILE} app.jar
EXPOSE 8080
ENTRYPOINT ["java", "-jar", "-Duser.timezone=Asia/Seoul", "app.jar"]
```

- **application.yml :**

```
springdoc:
  version: v1.0.0
  api-docs:
    path: /api-docs
  default-consumes-media-type: application/json
  default-produces-media-type: application/json
  swagger-ui:
    operations-sorter: alpha
    tags-sorter: alpha
    path: /swagger-ui.html
    disable-swagger-default-url: true
    display-query-params-without-oauth2: true

spring:
  datasource:
    url: jdbc:mariadb://mariadb-notice:3306/constelink_notice
    username: 계정명
    password: 비밀번호
    driver-class-name: org.mariadb.jdbc.Driver
```

ConstelinkFile:

- **Dockerfile :**

```
FROM openjdk:17-jdk-slim
ARG JAR_FILE=build/libs/*.jar
COPY ${JAR_FILE} app.jar
EXPOSE 8080
ENTRYPOINT ["java", "-jar", "-Duser.timezone=Asia/Seoul", "app.jar"]
```

- **application.yml :**

```yaml
springdoc:
  version: v1.0.0
  api-docs:
    path: /api-docs
  default-consumes-media-type: application/json
  default-produces-media-type: application/json
  swagger-ui:
    operations-sorter: alpha
    tags-sorter: alpha
    path: /swagger-ui.html
    disable-swagger-default-url: true
    display-query-params-without-oauth2: true

spring:
  servlet:
    multipart:
      max-file-size: 50MB
      max-request-size: 50MB
  gcp:
    config:
      file: constelink-config.json
    project:
      id: constelink
    bucket:
      id: carrot_box555
    dir:
      name: img
```

II. 빌드 및 배포

1. Podman 설치

- Ubuntu 20.10 버전 미만에서의 설치

```
. /etc/os-release
echo "deb
https://download.opensuse.org/repositories/devel:/kubic:/libcontainers:/stable/xUbu
ntu_${VERSION_ID}/ /" | sudo tee
```

```
/etc/apt/sources.list.d/devel:kubic:libcontainers:stable.list
curl -L
"https://download.opensuse.org/repositories/devel:/kubic:/libcontainers:/stable/xUb
untu_${VERSION_ID}/Release.key" | sudo apt-key add -

# 20.10버전 이상에서는 아래 커맨드만 실행
sudo apt update
sudo apt -y install podman
```

- sudo podman [COMMAND] 에서 에러 발생시]

```
# 다음 에러 발생
ERRO[0000] Error loading CNI config list file
/etc/cni/net.d/200-loopback.conflist: error parsing configuration list: no
name

# /etc/cni/net.d/200-loopback.conflist 파일 내용 수정
sudo vi /etc/cni/net.d/200-loopback.conflist

# /etc/cni/net.d/200-loopback.conflist
{
    "cniVersion": "1.0.0",
    "name": "loopback",
    "plugins": [
        {
            "type": "loopback"
        }
    ]
}
```

2. SSL 인증서 발급

- 초기 인증서 발급 (/etc/letsencrypt 에 발급)

```
podman run -it --rm --name certbot \
  -p 80:80 \
  -v '/etc/letsencrypt:/etc/letsencrypt' \
  -v '/var/lib/letsencrypt:/var/lib/letsencrypt' \
  certbot/certbot certonly -d '서버도메인' --standalone \
```

```
  --server https://acme-v02.api.letsencrypt.org/directory
```

- 재발급

```
podman run -it --rm --name certbot \
  -p 80:80 \
  -v '/etc/letsencrypt:/etc/letsencrypt' \
  -v '/var/lib/letsencrypt:/var/lib/letsencrypt' \
  certbot/certbot renew --standalone \
  --server https://acme-v02.api.letsencrypt.org/directory
```

3. Kubernetes 설치

- Ubuntu 방화벽 사용시 아래 포트들 허용

```
sudo ufw allow 80
sudo ufw allow 443
sudo ufw allow 179
sudo ufw allow 4798
sudo ufw allow 5473
sudo ufw allow 6443
sudo ufw allow 2379
sudo ufw allow 2380
sudo ufw allow 10250
sudo ufw allow 10251
sudo ufw allow 53
```

- CRI-O 설치

```
# .conf 파일을 만들어 부팅 시 모듈을 로드한다

# Controller / Worker

cat <<EOF | sudo tee /etc/modules-load.d/crio.conf
overlay
br_netfilter
```

```
EOF

sudo modprobe overlay
sudo modprobe br_netfilter


# 요구되는 sysctl 파라미터 설정, 이 설정은 재부팅 간에도 유지된다.

# Controller / Worker

cat <<EOF | sudo tee /etc/sysctl.d/99-kubernetes-cri.conf
net.bridge.bridge-nf-call-iptables  = 1
net.ipv4.ip_forward                 = 1
net.bridge.bridge-nf-call-ip6tables = 1
EOF

sudo sysctl --system


# Controller / Worker

sudo -i
export OS=xUbuntu_20.04 # OS 버전
export VERSION=1.26     # cri-o 버전

echo "deb
http://download.opensuse.org/repositories/devel:/kubic:/libcontainers:/stab
le:/cri-o:/$VERSION/$OS/ /" >
/etc/apt/sources.list.d/devel:kubic:libcontainers:stable:cri-o:$VERSION.lis
t

curl -L
https://download.opensuse.org/repositories/devel:kubic:libcontainers:stable
:cri-o:$VERSION/$OS/Release.key | apt-key add -

apt-get update

apt-get install cri-o cri-o-runc

sudo systemctl daemon-reload
sudo systemctl enable crio --now
sudo systemctl status crio
```

```
# CRI-O는 기본적으로 systemd cgroup 드라이버를 사용한다.
```

- kubeadm 설치

```
# curl 설치 (보통 설치되어 있으므로 pass)
sudo apt-get update
sudo apt-get install -y apt-transport-https ca-certificates curl


# 구글 클라우드의 공개 사이닝 키를 다운
sudo curl -fsSLo /usr/share/keyrings/kubernetes-archive-keyring.gpg
https://packages.cloud.google.com/apt/doc/apt-key.gpg

# 쿠버네티스 apt 리포지토리를 추가
echo "deb [signed-by=/usr/share/keyrings/kubernetes-archive-keyring.gpg]
https://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee
/etc/apt/sources.list.d/kubernetes.list

# apt 패키지 색인을 업데이트하고, kubelet, kubeadm, kubectl을 설치하고 해당
버전을 고정
sudo apt-get update
sudo apt-get install -y kubelet=1.26.2-00 kubeadm=1.26.2-00
kubectl=1.26.2-00
sudo apt-mark hold kubelet kubeadm kubectl

# Kubernetes CRI-O 구성
sudo vi /etc/systemd/system/kubelet.service.d/10-kubeadm.conf

## 다음 내용 추가
[Service]
Environment="KUBELET_EXTRA_ARGS=--container-runtime=remote
--cgroup-driver=systemd --runtime-request-timeout=15m
--container-runtime-endpoint='unix:///var/run/crio/crio.sock'"

# kubectl alias에 관한 shell 설정 추가
echo "alias k='kubectl'" >> ~/.bashrc
source ~/.bashrc
```

- 유용한 플러그인 kubectx, kubens 설치

```
sudo git clone https://github.com/ahmetb/kubectx /opt/kubectx
sudo ln -s /opt/kubectx/kubectx /usr/local/bin/kubectx
sudo ln -s /opt/kubectx/kubens /usr/local/bin/kubens
```

4. Kubernetes 세팅

- kubeadm으로 마스터 노드 초기화

```
# pod-network-cidr: 내부네트워크 범위
sudo kubeadm init --pod-network-cidr=192.168.0.0/16

# To start using your cluster, you need to run the following as a regular
user:
mkdir -p $HOME/.kube
sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
sudo chown $(id -u):$(id -g) $HOME/.kube/config

# Alternatively, if you are the root user, you can run:
export KUBECONFIG=/etc/kubernetes/admin.conf

# 마스터노드에 pod생성 허용
## Taints 확인
kubectl describe node <master-node-name> | grep Taints

## Taints가 존재할 경우 제거
kubectl taint node <master-node-name>
node-role.kubernetes.io/control-plane:NoSchedule-
```

- 워커노드 생성(다른 서버가 있을 경우)

```
# 마스터 노드에서 join 커맨드 출력
kubeadm token create --print-join-command

# 다른 기기에서 워커노드 생성
```

```
kubeadm join <control-plane-host>:<control-plane-port> --token <token>
--discovery-token-ca-cert-hash sha256:<hash>
```

- Calico CNI 설치

```
# Manifest
curl
https://raw.githubusercontent.com/projectcalico/calico/v3.25.0/manifests/ca
lico.yaml -O

vi calico.yaml
```

```
~~~
livenessProbe:
    exec:
      command:
      - /bin/calico-node
      - -felix-live
      - -bird-live # --> 이 부분을 삭제합니다.
    periodSeconds: 10
    initialDelaySeconds: 10
    failureThreshold: 6
  readinessProbe:
    exec:
      command:
      - /bin/calico-node
      - -felix-ready
      - -bird-ready # --> 이 부분을 삭제합니다.
~~~
kind: ConfigMap
apiVersion: v1
metadata:
  name: calico-config
  namespace: kube-system
data:
  # Typha is disabled.
  typha_service_name: "none"
  # 여기를 vxlan으로 수정합니다.
  calico_backend: "vxlan"
```

```
~~~
# Enable IPIP
- name: CALICO_IPV4POOL_IPIP
    value: "Never" # IP-IP 모드 비활성화
- name: CALICO_IPV4POOL_VXLAN
    value: "Always"
~~~
```

```
# calicoctl 설치
cd /usr/local/bin/

sudo curl -O -L
https://github.com/projectcalico/calicoctl/releases/download/v3
.20.6/calicoctl

sudo chmod +x calicoctl

export DATASTORE_TYPE=kubernetes

export KUBECONFIG=~/.kube/config
```

- 인증서 적용

```
# 아래 출력 내용 각각 복사
sudo cat /etc/letsencrypt/live/j8a206.p.ssafy.io/fullchain.pem | base64
sudo cat /etc/letsencrypt/live/j8a206.p.ssafy.io/privkey.pem | base64

# secret.yaml 생성
vi secret.yaml
```

```
# secret.yaml 내용
apiVersion: v1
kind: Secret
metadata:
  name: my-secret
type: kubernetes.io/tls
data:
  tls.crt: <복사한 fullcahin base64값>
  tls.key: <복사한 privkey base64값>
```

```
# secret을 적용
kubectl apply -f secret.yaml
```

- NodePort 할당 가능 범위 변경

```
sudo vi /etc/kubernetes/manifests/kube-apiserver.yaml
```

```
# 다음 내용 추가
~~~
spec:
  containers:
  - command:
    - --service-node-port-range=1-65535
~~~

# kube-system 네임스페이스의 pod를 삭제하면 다시 생성하면서 수정내용 반영
```

- Nginx Ingress Controller 설치

```
curl -o ingress-nginx.yaml
https://raw.githubusercontent.com/kubernetes/ingress-nginx/controller-v1.6.
4/deploy/static/provider/baremetal/deploy.yaml

# manifest 수정
vi ingress-nginx.yaml
```

```
# Service 부분에 nodePort 추가
~~~
ports:
  - appProtocol: http
    name: http
    port: 80
    protocol: TCP
    targetPort: http
    nodePort: 80
  - appProtocol: https
```

```
    name: https
    port: 443
    protocol: TCP
    targetPort: https
    nodePort: 443
~~~

# 마스터노드에 생성하려면 nodeSelector에 다음 내용 추가
~~~
spec:
  nodeSelector:
    node-role.kubernetes.io/control-plane: ""
~~~
```

```
# ingress-nginx.yaml 적용
kubectl apply -f ingress-nginx.yaml
```

- Ingress 리소스 생성 및 설정 : 서비스를 프록시 하기 위한 적절한 Ingress 설정

예시)

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: nginx-ingress
  annotations:
    kubernetes.io/ingress.class: nginx
spec:
  tls:
  - hosts:
    - 서버도메인
    secretName: my-secret
  rules:
  - host: 서버도메인
    http:
      paths:
      - path: /
        pathType: Prefix
        backend:
          service:
```

```
            name: my-service
            port:
              number: 80
```

5. DB 배포

- 각 API에 맞는 DB Manifest 생성 : **I-3 Kubernetes Manifest**의 mariadb 항목들 참조
- Manifest 적용

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

6. Jenkins CI

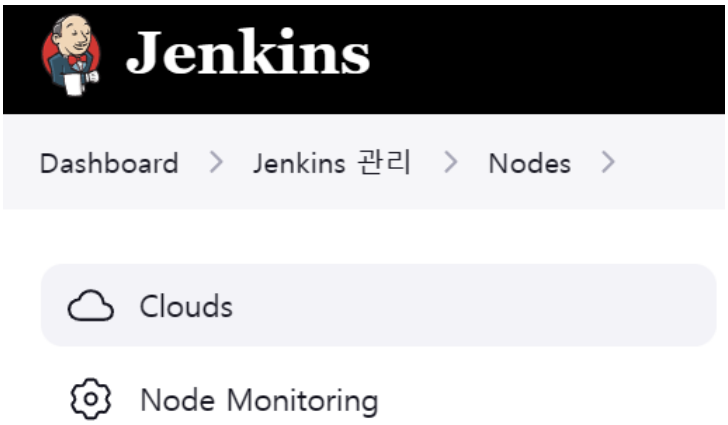
- Plugin 설치 : NodeJS, GitLagb, Kubernetes 플러그인 설치
- Credential 설정
    1. GitLab API Token : GitLab에서 액세스토큰을 발급받아서 등록
    2. GitLab Account : 종류를 Username with password로 하고 GitLab의 아이디, 비밀번호 입력
    3. Kubeconfig : Kind를 Secret file로 하고 서버에 있는 ~/.kube/config 파일을 등록
- Kubernetes에 Docker Hub Secret 등록

```
kubectl create secret docker-registry [secret name] \
--docker-username="[Docker Hub 계정]" \
--docker-password="[Docker Hub 패스워드]" \
--docker-server=https://index.docker.io/v1/
```

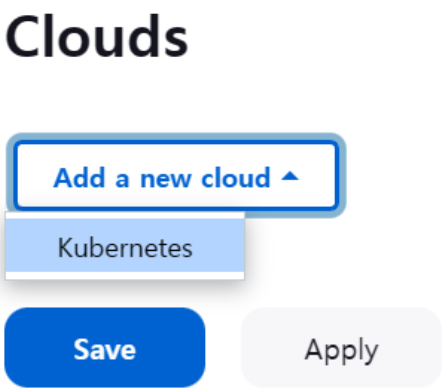
- 스프링부트 프로젝트들의 build.gradle에 다음 내용 추가

```
jar{
    enabled = false
}
```

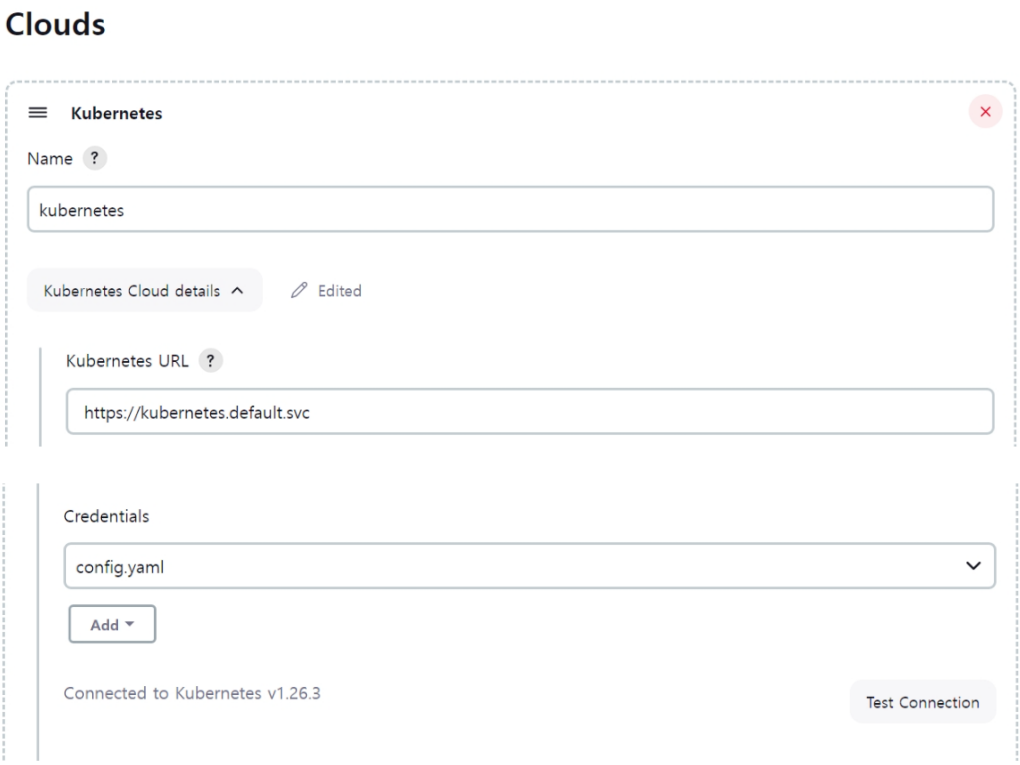
- Jenkins와 Kubernetes Cluster를 연동
    1. Jenkins 관리 - Nodes and Clouds - 왼쪽 Clouds 메뉴



    2. Add a new cloud - Kubernetes



3. 다음과 같이 설정

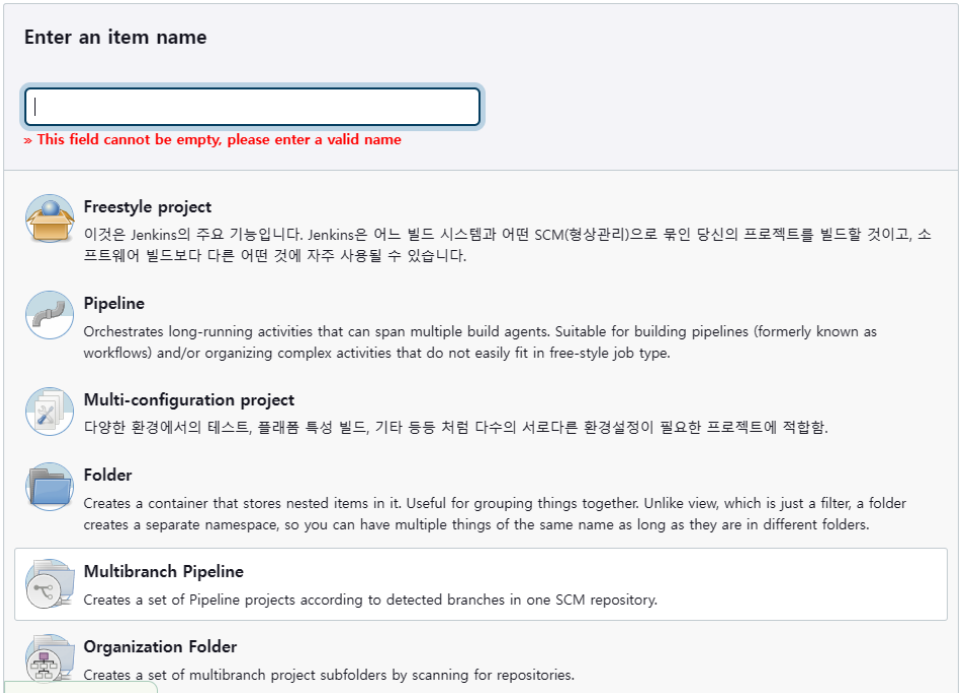


- **Name** : 임의로 설정
- **Kubernetes URL** : https://kubernetes.default.svc
- **Credentials** : 등록한 Kubeconfig 파일

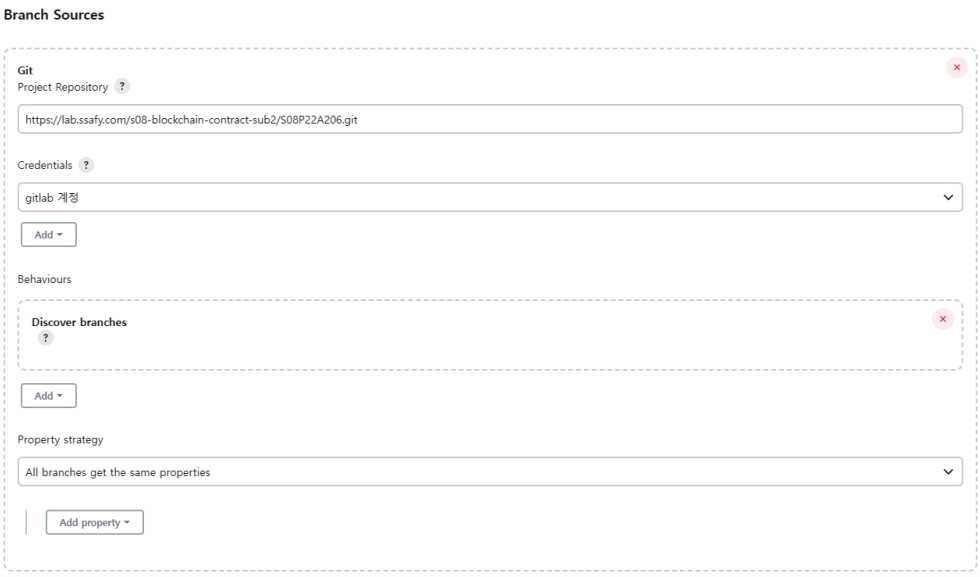
4. Test Connection을 눌러서 연결 확인

- Multibranch Pipeline 생성

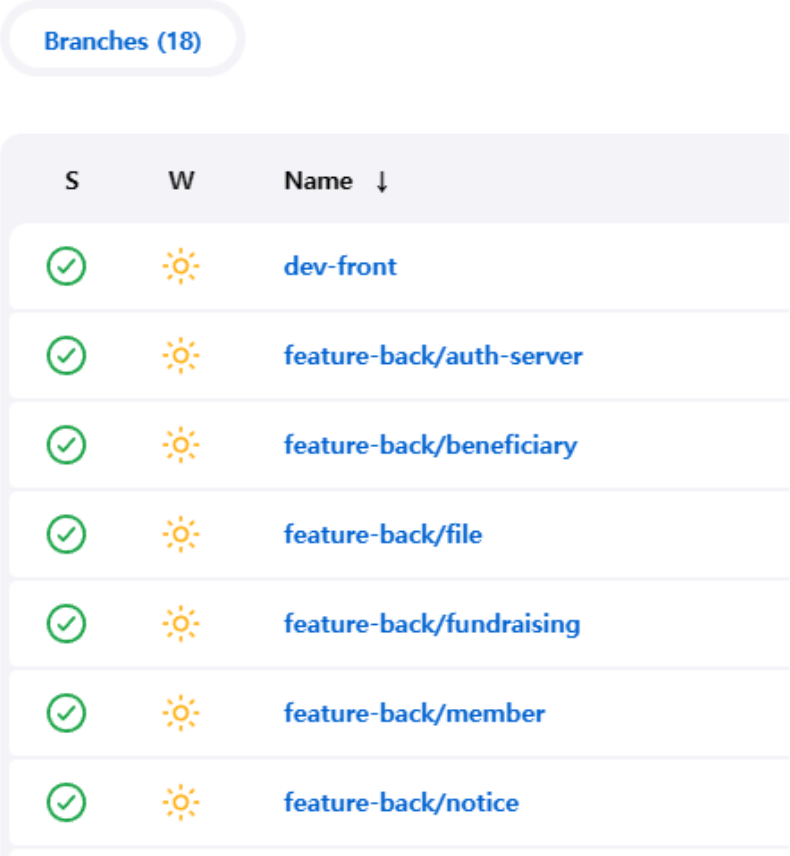
1. 새로운 Item - Multibranch Pipeline 선택



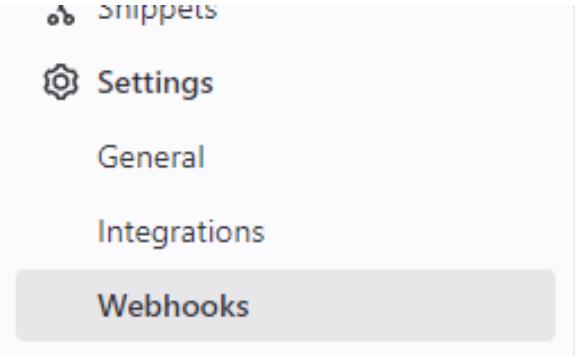
2. Branch Sources에 Repository와 Credentials 등록



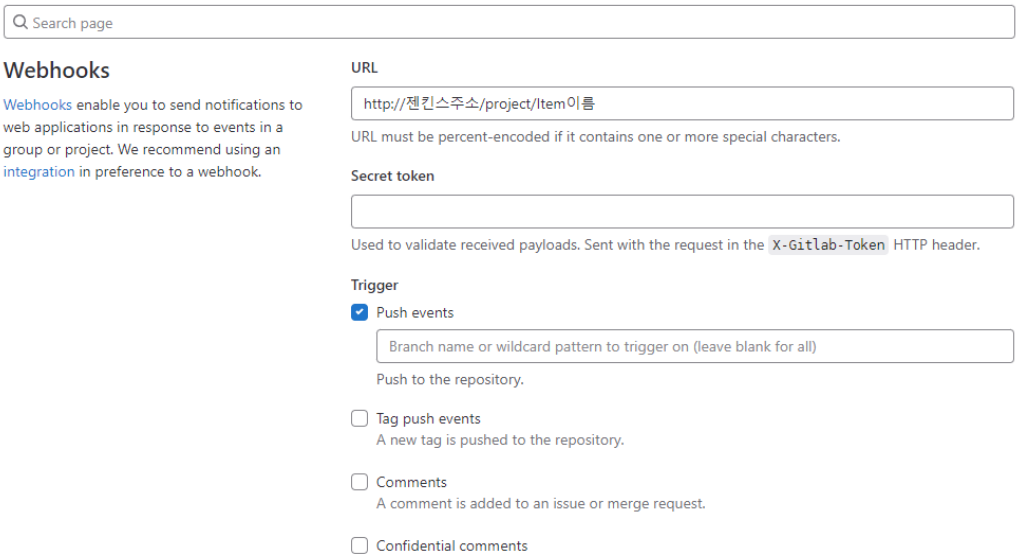
3. Jenkinsfile이 있는 브랜치는 다음과 같이 감지



- GitLab Webhook 설정
  1. GitLab 레포지토리 - Settings - Webhooks



2. 다음과 같이 설정



7. Argo CD

- Argo 설치

```
kubectl apply -n argocd -f
https://raw.githubusercontent.com/argoproj/argo-cd/stable/manifests/install.yaml
```

- NodePort 설정
  1. 서버 설정 열기

```
kubectl edit svc argocd-server -n argocd
```

  2. type을 NodePort로 변경하고 https에 사용할 포트를 nodePort로 추가

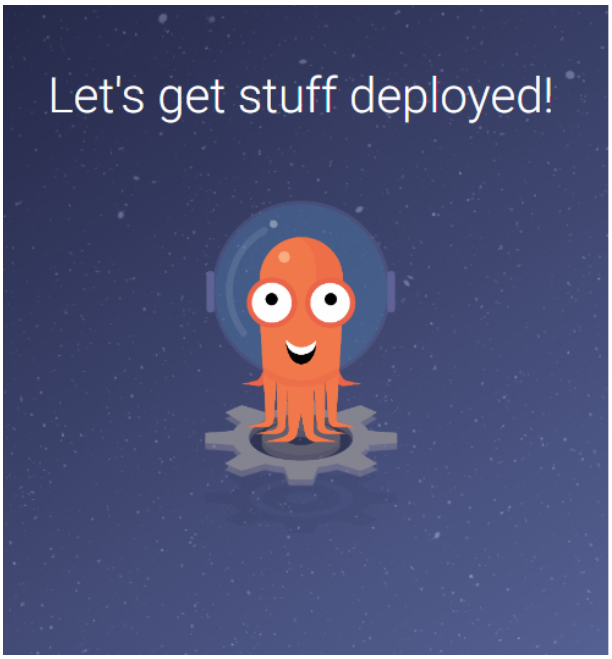
```
~~~
spec:
  ports:
  - name: http
    port: 80
    protocol: TCP
    targetPort: 8080
  - name: https
    nodePort: 사용할포트
    port: 443
    protocol: TCP
```

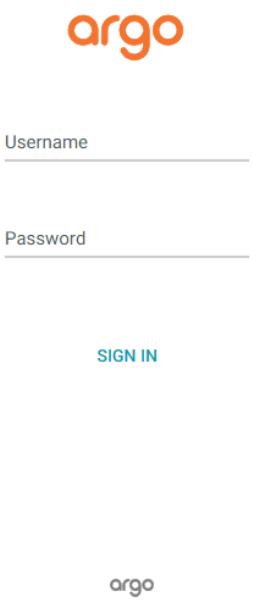
```
    targetPort: 8080
  selector:
    app.kubernetes.io/name: argocd-server
  sessionAffinity: None
  type: NodePort
~~~
```

- Argo CD 로그인
    1. 초기 비밀번호 복사

```
kubectl -n argocd get secret argocd-initial-admin-secret -o
jsonpath="{.data.password}" | base64 -d; echo
```

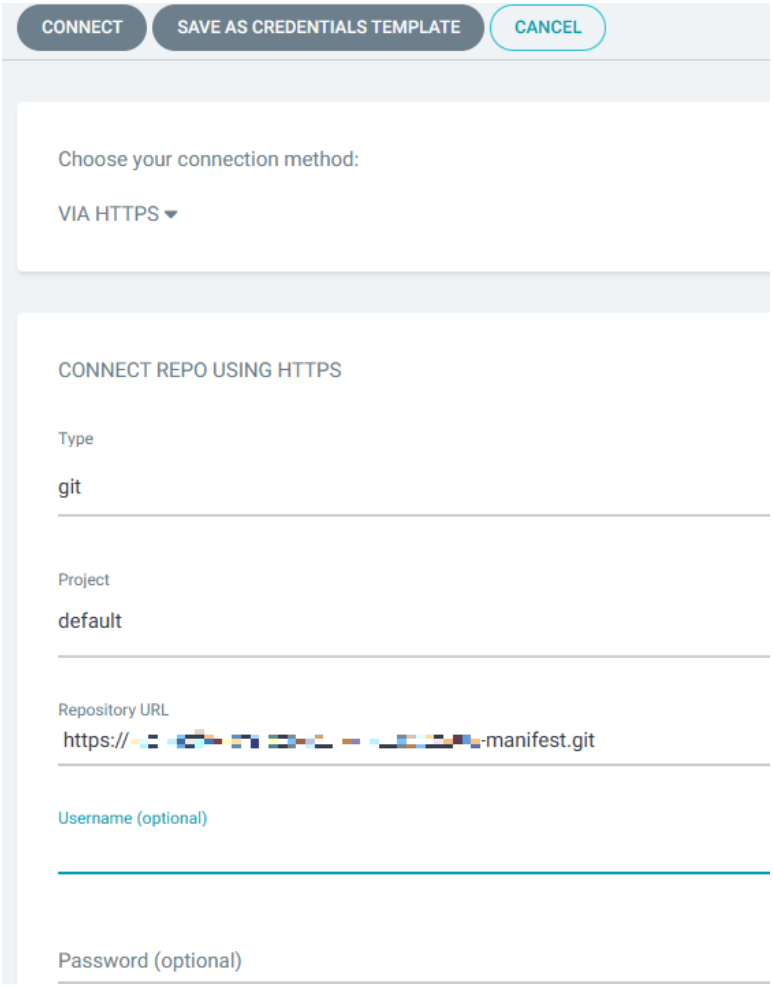
    2. 설정한 포트로 접속해서 로그인 (username : admin)





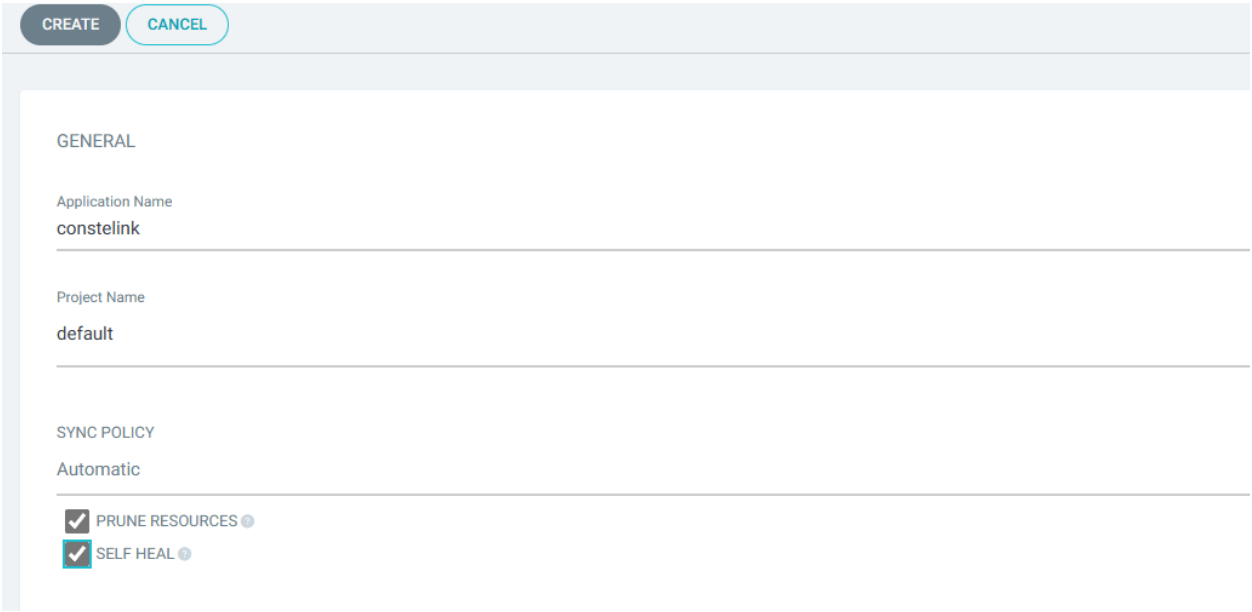
- Manifest들을 푸시한 레포지토리 준비 (**I-3 Kubernetes Manifest**의 constelink-**.yaml 파일들)

- Settings - Repository - CONNECT REPO 설정

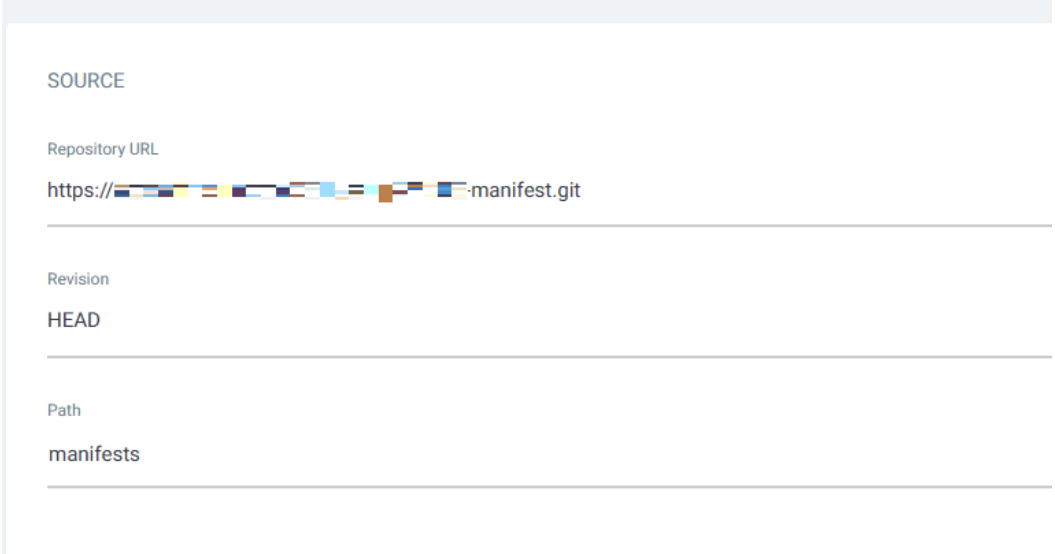


- **Project** : 기본으로 default 선택가능
- **Repository URL** : Manifest를 올린 레포지토리 주소
- **Username** : 레포지토리 계정 아이디
- **Password** : 레포지토리 계정 비밀번호

- Applications - NEW APP 설정

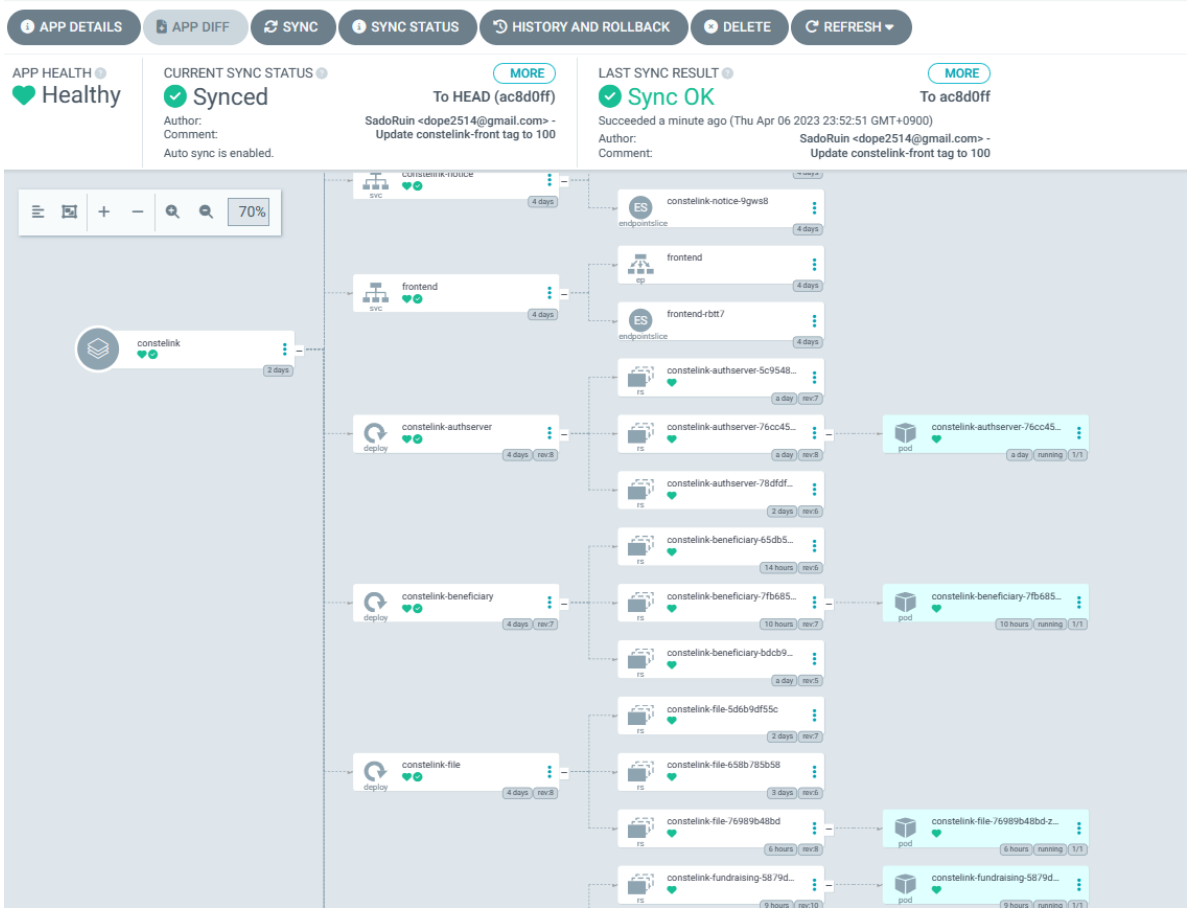


- **Application Name** : 임의로 설정
- **Project Name** : 기본으로 default 선택 가능
- **SYNC POLICY** : Automatic
- **PRUNE RESOURCES** : 체크
- **SELF HEAL** : 체크



- **Repository URL** : 아까 설정한 주소 선택
- **Path** : 레포지토리내에 manifest들이 들어있는 디렉토리명

- 리소스 한눈에 확인가능 및 젠킨스 빌드 이후 자동으로 배포



III. 외부 서비스

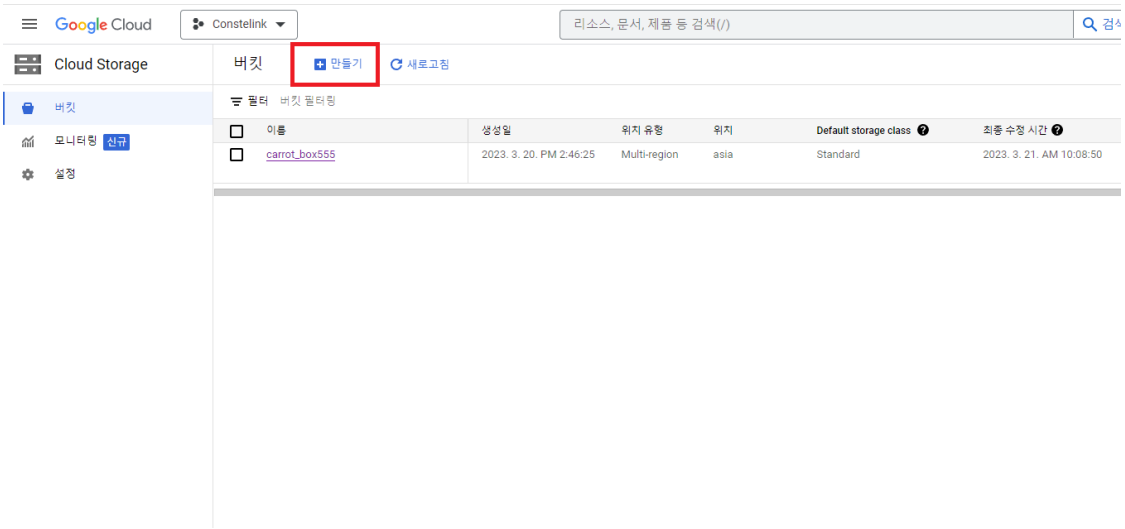
1. Google Cloud Storage

- Google Cloud Platform 3개월 무료 라이센스 발급

- Google Cloud Platform 프로젝트 생성

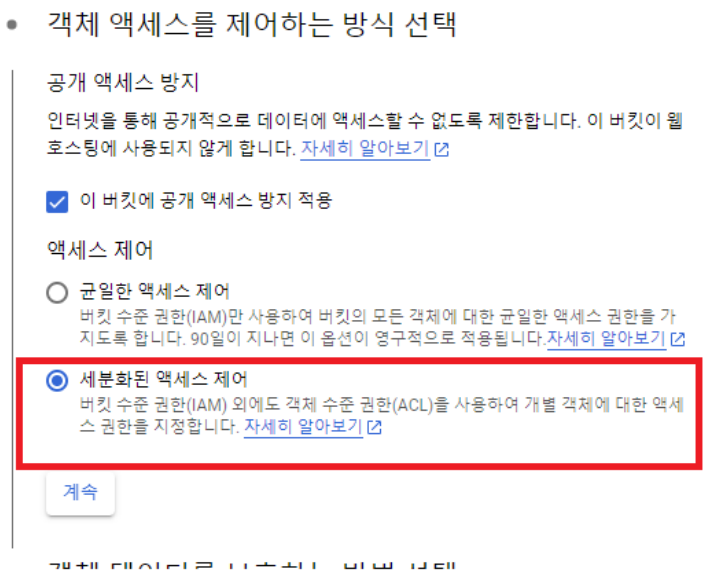
- GCS 버킷 생성
    1. Google Cloud Storage 서비스로 이동

2. 버킷 생성 클릭

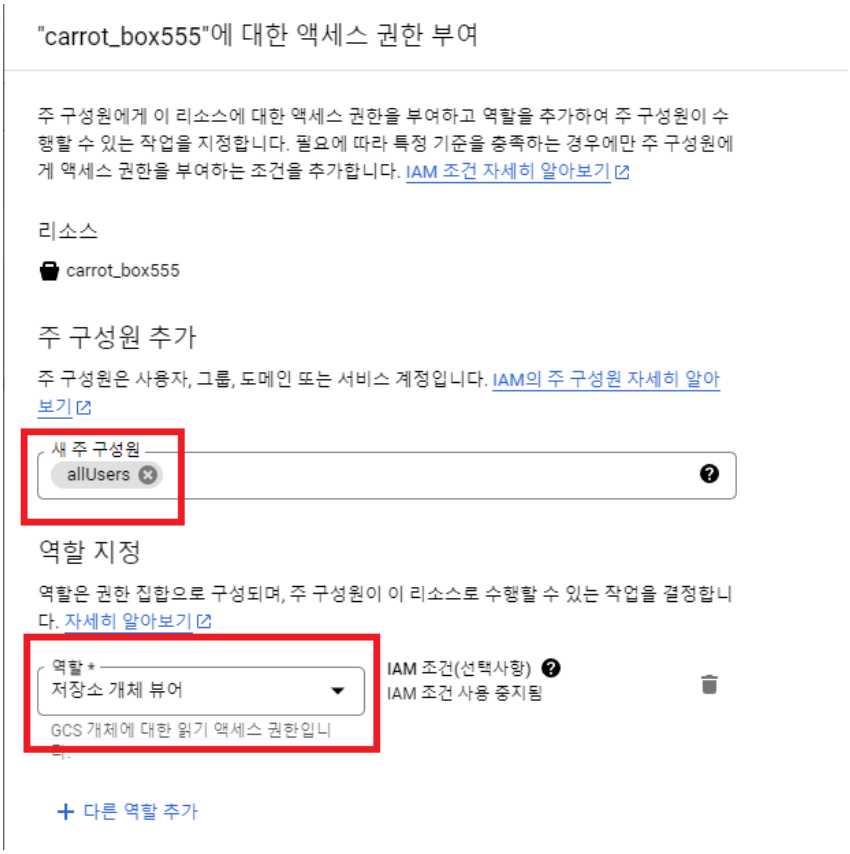


3. 버킷 이름 및 리전 설정

4. 버킷 엑세스 제어 방식 선택



5. 버킷 생성 완료 후 우측 메뉴에서 액세스 수정 선택
6. 주 구성원 클릭 후 버킷 액세스 권한 설정



7. IAM 및 관리자 탭에서 서비스 계정 선택
8. 생성되어있는 서비스 계정 클릭
9. 상단에 키 탭 선택 후 키 생성 클릭
10. JSON 형태의 파일로 다운
11. 해당 JSON 파일을 프로젝트 폴더 안에 위치시켜 사용 (상세 설정은 application.yml 참고)