

# K8s Pod SSH 외부 서비스

## 08. Kubernetes Network (Ingress)

### On-Premise 환경의 경우 Load Balancer를 배포

#### MetalLB 배포

```
$ kubectl apply -f https://raw.githubusercontent.com/google/metallb/v0.8.3/manifests/metallb.yaml
```

#### MetalLB 설정 (ConfigMap 배포)

```
apiVersion: v1
kind: ConfigMap
metadata:
  namespace: metallb-system # 고정 namespace 값
  name: config               # 고정 name 값
data:
  config: |
    address-pools:
    - name: my-ip-space
      protocol: layer2
      addresses:
      - 100.100.0.124-100.100.0.200 # address 부분 : 외부로 노출할 수 있는 IP 범위를
```

명시

### NGINX Ingress Controller 설치

[kubernetes.io](https://kubernetes.io) 에 접속하여 Document에서 ingress controller → nginx 로 이동하여 링크 다운로드  
[Ingress | Kubernetes](#)

```
$ wget https://raw.githubusercontent.com/kubernetes/ingress-nginx/controller-  
v1.3.0/deploy/static/provider/baremetal/deploy.yaml
```

```
$ ls
```

```
>>> deploy.yaml
```

deploy.yaml 파일에서 Service 포트 추가 및 type 수정

```
apiVersion: v1  
kind: Namespace  
metadata:  
---  
(생략)  
---  
apiVersion: v1  
kind: Service  
(생략)  
spec:  
  externalTrafficPolicy: Local  
  ports:  
# 포트 추가  
  - name: ssh  
    port: 5596  
    protocol: TCP  
    targetPort: 22  
    (생략)  
  type: LoadBalancer  
  (생략)  
---  
apiVersion: apps/v1  
kind: Deployment  
metadata:  
(생략)  
spec:  
(생략)  
  template:  
(생략)
```

```
spec:
  containers:
    - args:
# 아래 내용 추가
      - --tcp-services-configmap=ingress-nginx/{configmap_name}
(생략)
```

## 배포

```
$ kubectl apply -f deploy.yaml
```

```
$ kubectl get svc -n ingress-nginx
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP
ingress-nginx-controller	LoadBalancer	10.98.248.35	
100.100.0.124 5596:30300/TCP 54m			
ingress-nginx-controller-admission	ClusterIP	10.106.59.43	<none>
443/TCP 54m			

## 매니페스트

### deployment.yaml

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: yss-deployments
spec:
  replicas: 3
  selector:
    matchLabels:
      name: yss-ssh
  template:
    metadata:
      labels:
```

```

      name: yss-ssh
    spec:
      containers:
        - image: mw.hub:5000/jupyter:5596
          name: jupyter
          command:
            - "/bin/sh"
            - "-c"
          args:
            - tail -f /dev/null
          ports:
            - containerPort: 22
      ---
    apiVersion: v1
    kind: Service
    metadata:
      name: ssh-service
    spec:
      ports:
        - port: 5596
          protocol: TCP
          targetPort: 22
      selector:
        name: yss-ssh

```

## service.yaml

```

apiVersion: v1
kind: Service
metadata:
  name: ssh-service
spec:
  ports:
    - port: 5596
      protocol: TCP
      targetPort: 22
  selector:
    name: yss-ssh

```

## ingress-configmap.yaml

```
apiVersion: v1
kind: ConfigMap
metadata:
  name: my-tcp-services
  namespace: ingress-nginx
data:
  5596: "default/ssh-service:5596"
```

## 배포 시작

### deployment 배포

```
$ kubectl apply -f deployment.yaml
```

```
$ kubectl get pod
```

```
>>>
```

NAME	READY	STATUS	RESTARTS	AGE
yss-deployments-5cfbf97598-69877	1/1	Running	0	107m
yss-deployments-5cfbf97598-cdqv7	1/1	Running	0	107m
yss-deployments-5cfbf97598-gnjnf	1/1	Running	0	107m

### Service 배포

```
$ kubectl apply -f service.yaml
```

```
$ kubectl get svc
```

```
>>>
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	70d
ssh-service	ClusterIP	10.97.113.150	<none>	5596/TCP	112m

서비스 Cluster Ip:Port 로 Pod 에 접속 되는지 확인

```
$ ssh 10.97.113.150 -p 5596
>>>
root@k8s-master:~/test_yaml/external/20220727# ssh 10.97.113.150 -p 5596
root@10.97.113.150's password:
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.4.0-122-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.
Last login: Thu Jul 28 14:40:31 2022 from 10.40.0.2
root@yss-deployments-5cfbf97598-gnjnf:~#
```

Ingress ConfigMap 배포

```
$ kubectl apply -f ingress-configmap.yaml

$ kubectl get configmap -n ingress-nginx
>>>
NAME                                DATA  AGE
ingress-controller-leader           0      56m
ingress-nginx-controller            1      56m
kube-root-ca.crt                    1      56m
my-tcp-services                     1      25m
```

Ingress IP 확인

```
$ kubectl get svc -n ingress-nginx
```

```
>>>
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP
ingress-nginx-controller	LoadBalancer	10.98.248.35	
100.100.0.124 5596:30300/TCP	60m		
ingress-nginx-controller-admission	ClusterIP	10.106.59.43	<none>
443/TCP	60m		

## Ingress IP로 외부 접속 되는지 확인

### Kubernetes Cluster 내부에서 확인

```
$ ssh 100.100.0.124 -p 5596
```

```
root@k8s-master:~/test_yaml/external/20220727# ssh 100.100.0.124 -p 5596
```

```
root@100.100.0.124's password:
```

```
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.4.0-122-generic x86_64)
```

```
* Documentation:  https://help.ubuntu.com
```

```
* Management:    https://landscape.canonical.com
```

```
* Support:        https://ubuntu.com/advantage
```

```
This system has been minimized by removing packages and content that are  
not required on a system that users do not log into.
```

```
To restore this content, you can run the 'unminimize' command.
```

```
Last login: Thu Jul 28 14:45:20 2022 from 10.40.0.2
```

```
root@yssh-deployments-5cfbf97598-69877:~#
```

### 클러스터 외부 장비에서 확인

```
$ ssh root@100.100.0.124 -p 30300
```

```
>>> ssh: connect to host 100.100.0.124 port 30333: Connection refused
```

### 공유기 포트포워딩 후 외부에서 접속 시도

```
$ ssh root@miruware-a.iptime.org -p 30300  
>>> ssh: connect to host 100.100.0.124 port 30300: Connection refused
```

ingress-nginx-controller와 configmap 설정을 변경하면서 확인한 결과  
서비스에 문제가 있는 것은 아님.

외부에서 ingress-controller를 통해 접속할 때 인증서 관련 문제로 차단이 되는 것으로 보임.

ingress-nginx-controller의 yaml 에서 port 를 변경 시 ssh 접속 포트가 바뀜.

ex) port: 30300

targetPort: 5596

이라고 하면 ssh 포트가 30300번으로 변경됨.

위 방법으로 변경 후 외부 접속 시도시에도 동일하게 차단됨.