

6. ansible

1 . docker로 ansible 올리기

- Docker repository
 - <https://hub.docker.com/r/edowon0623>
- Ansible 이미지 다운로드
 - Windows, MacOS intel chip) `docker pull edowon0623/ansible:latest` (*updated by 2022-09-21*)
 - MacOS silicon chip, m1) `docker pull edowon0623/ansible-server:m1`
- Windows) Ansible 컨테이너 실행 명령어 (방법1)
 - `docker run --privileged -itd --name ansible-server -p 20022:22 -p 8081:8080 -e container=docker -v /sys/fs/cgroup:/sys/fs/cgroup edowon0623/ansible:latest /usr/sbin/init`
 - 컨테이너에서 실행, `/etc/sysconfig/docker` 파일이 존재하지 않을 경우에는 아래의 `vi`, `sed` 명령어는 실행하지 않음)
 - `$ vi /etc/sysconfig/docker`
 - `$ sed -i -e 's/overlay2/vfs/g' /etc/sysconfig/docker-storage`
 - `$ systemctl start docker`
 - `$ systemctl status docker`
- Windows) Ansible 컨테이너 실행 명령어 (방법2, 위 명령어로 실행되지 않을 경우)
 - `docker run -itd --name ansible-server -p 20022:22 -e container=docker --tmpfs /run --tmpfs /tmp -v /sys/fs/cgroup:/sys/fs/cgroup:ro -v /var/run/docker.sock:/var/run/docker.sock edowon0623/ansible:latest /usr/sbin/init`
 - 컨테이너에서 실행
 - `$ systemctl status docker`
- MacOS intel chip) Ansible 컨테이너 실행 명령어
 - `docker run --privileged --itd -p 20022:22 -p 8081:8080 -e container=docker -v /sys/fs/cgroup:/sys/fs/cgroup edowon0623/ansible:latest /usr/sbin/init`
 - 컨테이너에서 실행, `/etc/sysconfig/docker` 파일이 존재하지 않을 경우에는 아래의 `vi`, `sed` 명령어는 실행하지 않음)

- `$ vi /etc/sysconfig/docker`
- `$ sed -i -e 's/overlay2/vfs/g' /etc/sysconfig/docker-storage`
- `$ systemctl start docker`
- `$ systemctl status docker`
- MacOS silicon chip, m1)) Ansible 컨테이너 실행 명령어
 - `docker run --privileged --itd -p 20022:22 -p 8081:8080 -e container=docker -v /sys/fs/cgroup:/sys/fs/cgroup edowon0623/ansible-server:m1 /usr/sbin/init`
 - 컨테이너에서 실행)
 - `$ systemctl start docker`
 - `$ systemctl status docker`

2. ansible 설치 후 확인

- 버전
 - ``ansible --version`
- 관리 대상 서버를 /etc/ansible/hosts 파일에 등록
 - windows cmd에서 `docker network inspect bridge` 로 ip 확인

```
"ConfigOnly": false,
"Containers": {
  "eb0201ac5fe016561d15b4a89214ac88add2e9531d2fc1b8163bf72475e44642": {
    "Name": "jenkins-server",
    "EndpointID": "0bcddc1243d131bbf0ed9b7e27dde15e7109d75236f2715932005ab292d6c155a",
    "MacAddress": "02:42:ac:11:00:02",
    "IPv4Address": "172.17.0.2/16",
    "IPv6Address": ""
  },
  "ee81181ccfb485c720e8a2be6ccfbf7c77e5b4f1f4fb5a8d6bad75ce6f8995ec": {
    "Name": "ansible-server",
    "EndpointID": "7c8f138443209454554581c5d823ccfcd57e7c3a495ec8c02d4ac12afaf58115",
    "MacAddress": "02:42:ac:11:00:03",
    "IPv4Address": "172.17.0.3/16",
    "IPv6Address": ""
  },
  "f17905009f320e8ca2f711e0fdf1c96ca20addf1d62572af616e260f20aaf1ca": {
    "Name": "docker-server2",
    "EndpointID": "4f62b52ab2c85885b76d4e1e50001e57a9e4f666fdd91c134066675f8005ce32",
    "MacAddress": "02:42:ac:11:00:04",
    "IPv4Address": "172.17.0.4/16",
    "IPv6Address": ""
  }
}
```

- /etc/ansible/hosts 해당 파일이 없을경우 생성하여 파일 수정

```
root@ee81181ccfb4:/etc/ansible
[devops]
172.17.0.2
172.17.0.4
~
~
~
```

ansible 172.17.0.3
jenkins 172.17.0.2
docker 172.17.0.4

- ansible 서버에서 SSH 접속 키 생성
 - ssh-keygen
 - ssh-copy-id root@[관리할 서버 IP]

첫번째 문제

- 이전에 22번 포트 포워딩을 하지 않은 서버들은 접속이 안되어서 재시작
 - `docker stop [컨테이너ID]`
 - `docker commit [컨테이너ID] [생성할 이미지명]`
 - 새로 생성한 이미지로 기존 옵션에 22번 포트 옵션 추가하여 run
 - ex) `docker run -d -v jenkins_home:/var/jenkins_home -p 8080:8080 -p 50000:50000 -p 30022:22 --restart=on-failure --name jenkins-server-01 jenkins-server-0924`
 - 기존에 저장되어 있던 작업물은 그대로 있다.

두번째 문제

- jenkins 서버에 ssh가 활성화가 안되어 있어서 root로 설치
 - root로 컨테이너 접속 방법 > `docker exec -it -u 0 [컨테이너ID] bash`
 - ssh 설치 > `apt install openssh-server`
 - 접근 확인 > `curl localhost:22`

3. ansible 실행 옵션

- -i : 적용 될 호스트들에 대한 파일 정보
- -m : 모듈 선택
- -k : 관리자 암호 요청
- -K : 관리자 권한 상승
- --list-hosts : 적용되는 호스트 목록

4. Ansible Test

- `ansible all -m ping` : 그룹에 등록된 모든 호스트에게 ping 전달
- `ansible all -m shell -a "free -h"` : 메모리 확인
- `ansible all -m copy -a "src=./test.txt dest=/tmp"` : 파일 복사
- `ansible devops -m yum -a "name=httpd state=present"` : devops 그룹 httpd 설치

```
[root@ee81181ccfb4 ~]# ansible devops -m yum -a "name=httpd state=present"
172.17.0.3 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/libexec/platform-python"
  },
  "changed": true,
  "msg": "",
  "rc": 0,
  "results": [
    "Installed: apr-1.6.3-12.el8.x86_64",
    "Installed: httpd-filesystem-2.4.37-43.module_el8.5.0+1022+b541f3b1.noarch",
    "Installed: apr-util-1.6.1-6.el8.x86_64",
    "Installed: apr-util-bdb-1.6.1-6.el8.x86_64",
    "Installed: httpd-tools-2.4.37-43.module_el8.5.0+1022+b541f3b1.x86_64",
    "Installed: mod_http2-1.15.7-3.module_el8.4.0+778+c970deab.x86_64",
    "Installed: brotli-1.0.6-3.el8.x86_64",
    "Installed: apr-util-openssl-1.6.1-6.el8.x86_64",
    "Installed: mailcap-2.1.48-3.el8.noarch",
    "Installed: centos-logos-httpd-85.8-2.el8.noarch",
    "Installed: httpd-2.4.37-43.module_el8.5.0+1022+b541f3b1.x86_64"
  ]
}
172.17.0.4 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/libexec/platform-python"
  },
  "changed": true,
  "msg": "",
  "rc": 0,
  "results": [
    "Installed: centos-logos-httpd-85.8-2.el8.noarch",
    "Installed: httpd-2.4.37-43.module_el8.5.0+1022+b541f3b1.x86_64",
    "Installed: apr-1.6.3-12.el8.x86_64",
    "Installed: httpd-filesystem-2.4.37-43.module_el8.5.0+1022+b541f3b1.noarch",
    "Installed: apr-util-1.6.1-6.el8.x86_64",
    "Installed: apr-util-bdb-1.6.1-6.el8.x86_64",
    "Installed: httpd-tools-2.4.37-43.module_el8.5.0+1022+b541f3b1.x86_64",
    "Installed: mod_http2-1.15.7-3.module_el8.4.0+778+c970deab.x86_64",
    "Installed: brotli-1.0.6-3.el8.x86_64",
    "Installed: apr-util-openssl-1.6.1-6.el8.x86_64",
    "Installed: mailcap-2.1.48-3.el8.noarch"
  ]
}
[root@ee81181ccfb4 ~]#
```

5. Ansible Playbook

- 사용자가 원하는 내용을 미리 작성해 놓은 파일
- 1. playbook 작성

```
---
- name: Add an ansible hosts
  hosts: localhost
  tasks:
    - name: Add an ansible hosts
      blockinfile:
        path: /etc/ansible/hosts
        block: |
```

```
[mygroup]
172.17.0.5
```

- 1-2) playbook 실행

- ansible-playbook first-playbook.yml

```
[root@ee81181ccfb4 ~]# cat /etc/ansible/hosts
[devops]
172.17.0.3
172.17.0.4
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# ansible-playbook first-playbook.yml

PLAY [Add an ansible hosts] *****

TASK [Gathering Facts] *****
ok: [localhost]

TASK [Add an ansible hosts] *****
changed: [localhost]

PLAY RECAP *****
localhost                : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# cat /etc/ansible/hosts
[devops]
172.17.0.3
172.17.0.4
# BEGIN ANSIBLE MANAGED BLOCK
[mygroup]
172.17.0.5
# END ANSIBLE MANAGED BLOCK
[root@ee81181ccfb4 ~]#
```

- 2. 두번째 playbook 작성

```
- name: Ansible Copy Example Local to Remtoe
hosts: devops
tasks:
  - name: copying file with playbook
    copy:
      src: ~/sample.txt
      dest: /tmp
      owner: root
      mode: 0644
```

- 2-1) playbook 실행 및 결과 확인

```
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# ansible-playbook playbook-sample1.yml

PLAY [Ansible Copy Example Local to Remote] *****

TASK [Gathering Facts] *****
ok: [172.17.0.4]
ok: [172.17.0.3]

TASK [copying file with playbook] *****
changed: [172.17.0.4]
changed: [172.17.0.3]

PLAY RECAP *****
172.17.0.3      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.4      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# ls -al /tmp
total 48
drwxrwxrwt 1 root root 4096 Sep 25 13:00 .
drwxr-xr-x 1 root root 4096 Sep 23 14:44 ..
drwxrwxrwt 2 root root 4096 Sep 15 2021 .font-unix
drwxrwxrwt 2 root root 4096 Sep 15 2021 .ICE-unix
-rwx----- 1 root root 701 Sep 15 2021 ks-script-4luisyla
-rwx----- 1 root root 671 Sep 15 2021 ks-script-o23i7rc2
-rwx----- 1 root root 291 Sep 15 2021 ks-script-x6ei4wu
-rw-r--r-- 1 root root 7 Sep 25 13:00 sample.txt
-rw-r--r-- 1 root root 7 Sep 24 15:01 test.txt
drwxrwxrwt 2 root root 4096 Sep 15 2021 .Test-unix
drwxrwxrwt 2 root root 4096 Sep 15 2021 .X11-unix
drwxrwxrwt 2 root root 4096 Sep 15 2021 .XIM-unix
[root@ee81181ccfb4 ~]#
```

- 3. 세번째 playbook 작성

```
---
- name: Download Tomcat9 from tomcat.apache.org
  hosts: all
  #become: yes
  # become_user: root
  tasks:
    - name: Create a Directory /opt/tomcat9
      file:
        path: /opt/tomcat9
        state: directory
        mode: 0755
    - name: Download the Tomcat checksum
      get_url:
        url: https://downloads.apache.org/tomcat/tomcat-
9/v9.0.80/bin/apache-tomcat-9.0.80.tar.gz.sha512
        dest: /opt/tomcat9/apache-tomcat-9.0.80.tar.gz.sha512
    - name: Register the checksum value
      shell: cat /opt/tomcat9/apache-tomcat-9.0.80.tar.gz.sha512 | grep
```

```

apache-tomcat-9.0.80.tar.gz | awk '{ print $1 }'
    register: tomcat_checksum_value
- name: Download Tomcat using get_url
  get_url:
    url: https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.80/bin/apache-
tomcat-9.0.80.tar.gz
    dest: /opt/tomcat9
    mode: 0755
    checksum: sha512:{{ tomcat_checksum_value.stdout }}"

```

- 3-1) playbook 실행 및 결과 확인
 - 172.17.0.5는 없는 host, 결과는 정상이다

```

[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# ansible-playbook playbook-sample2.yml

PLAY [Download Tomcat9 from tomcat.apache.org] *****

TASK [Gathering Facts] *****
ok: [172.17.0.3]
ok: [172.17.0.4]
Fatal: [172.17.0.5]: UNREACHABLE! => {"changed": false, "msg": "Failed to connect to the host via ssh: ssh: connect to host 172.17.0.5 port :
2: No route to host", "unreachable": true}

TASK [Create a Directory /opt/tomcat9] *****
ok: [172.17.0.4]
ok: [172.17.0.3]

TASK [Download the Tomcat checksum] *****
changed: [172.17.0.3]
changed: [172.17.0.4]

TASK [Register the checksum value] *****
changed: [172.17.0.3]
changed: [172.17.0.4]

TASK [Download Tomcat using get_url] *****
changed: [172.17.0.4]
changed: [172.17.0.3]

PLAY RECAP *****
172.17.0.3      : ok=5    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.4      : ok=5    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.5      : ok=0    changed=0    unreachable=1    failed=0    skipped=0    rescued=0    ignored=0

```

6. jenkins + ansible 연동하기

- jenkins에서 Publish over SSH 설정 추가

SSH Server

Name ?

ansible-host

Hostname ?

172.17.0.4

Username ?

root

Remote Directory ?

/root

☐

Avoid sending files that have not changed ?

고급 ^

✎ Edited

☒ Use password authentication, or use a different key ?

Passphrase / Password ?

.....

7. 새로운 item 추가 (My-Docker-Project Copy)

- 기존 빌드 후 조치 항목 삭제

- 빌드 후 조치 추가 > Send build artifacts over SSH

빌드 후 조치

Send build artifacts over SSH ?

SSH Publishers

SSH Server

Name ?

ansible-host

고급 ▾

Transfers

Transfer Set

Source files ?

target/*.war

Remove prefix ?

target

Remote directory ?

.

Exec command ?

All of the transfer fields (except for Exec timeout) support substitution of [Jenkins environment variables](#)

고급 ▾

저장

Apply

- 빌드 테스트

```
[root@ee81181ccfb4 ~]# ls -al
total 7916
dr-xr-x--- 1 root root 4096 Sep 25 15:02 .
drwxr-xr-x 1 root root 4096 Sep 23 14:44 ..
-rw----- 1 root root 2361 Sep 15 2021 anaconda-ks.cfg
-rw-r--r-- 1 root root 608 Sep 15 2021 anaconda-post.log
drwxr-xr-x 4 root root 4096 Sep 24 14:51 .ansible
-rw----- 1 root root 985 Sep 24 15:20 .bash_history
-rw-r--r-- 1 root root 18 May 11 2019 .bash_logout
-rw-r--r-- 1 root root 176 May 11 2019 .bash_profile
-rw-r--r-- 1 root root 176 May 11 2019 .bashrc
drwxr-xr-x 1 root root 4096 Sep 20 2022 .cache
-rw-r--r-- 1 root root 100 May 11 2019 .cshrc
-rw-r--r-- 1 root root 129 Sep 20 2022 Dockerfile
-rw-r--r-- 1 root root 204 Sep 25 12:30 first-playbook.yml
-rw-r--r-- 1 root root 8025930 Sep 25 15:02 hello-world.war
-rw----- 1 root root 2059 Sep 15 2021 original-ks.cfg
-rw-r--r-- 1 root root 209 Sep 25 12:48 playbook-sample1.yml
-rw-r--r-- 1 root root 900 Sep 25 13:35 playbook-sample2.yml
-rw-r--r-- 1 root root 7 Sep 24 15:00 sample.txt
drwx----- 2 root root 4096 Sep 25 12:59 .ssh
-rw-r--r-- 1 root root 129 May 11 2019 .tcshrc
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# date
Mon Sep 25 15:02:31 UTC 2023
[root@ee81181ccfb4 ~]#
```

8. playbook 생성

- first-devops-playbook.yml

```
- hosts: all
#   become: true

tasks:
- name: build a docker image with deployed war file
  command: docker build -t cicd-project-ansible .
  args:
    chdir: /root
```

- 현재 디렉토리에서 hosts 파일 생성
- ansible 서버의 ip 입력 후 저장

```
[root@ee81181ccfb4 ~]#  
[root@ee81181ccfb4 ~]#  
[root@ee81181ccfb4 ~]# pwd  
/root  
[root@ee81181ccfb4 ~]# cat hosts  
172.17.0.4  
[root@ee81181ccfb4 ~]#
```

- Dockerfile 생성

```
FROM tomcat:9.0
```

```
LABEL org.opencontainers.image.authors="edowon0623@gmail.com"
```

```
COPY ./hello-world.war /usr/local/tomcat/webapps
```

- playbook 실행

```
- ansible-playbook -i hosts first-devops-playbook.yml
```

```
[root@ee81181ccfb4 ~]#  
[root@ee81181ccfb4 ~]# ansible-playbook -i hosts first-devops-playbook.yml  
  
PLAY [all] *****  
  
TASK [Gathering Facts] *****  
ok: [172.17.0.4]  
  
TASK [build a docker image with deployed war file] *****  
changed: [172.17.0.4]  
  
PLAY RECAP *****  
172.17.0.4 : ok=2 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0  
  
[root@ee81181ccfb4 ~]#  
[root@ee81181ccfb4 ~]#  
[root@ee81181ccfb4 ~]#  
[root@ee81181ccfb4 ~]# docker images  
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE  
cicd-project-ansible latest      dee66b54404e  2 minutes ago 435MB  
tomcat               9.0        3740ba5d8885  3 weeks ago  427MB  
[root@ee81181ccfb4 ~]#
```

- playbook 내용 추가

```
- hosts: all
```

```
# become: true
```

```
tasks:
```

```
- name: build a docker image with deployed war file  
  command: docker build -t cicd-project-ansible .
```

```

args:
  chdir: /root

- name: create a container using cicd-project-ansible image
  command: docker run -d --name my_cicd_project -p 8080:8080 cicd-
project-ansible

```

- playbook 실행 및 결과 확인

```

[root@ee81181ccfb4 ~]# ansible-playbook -i hosts first-devops-playbook.yml

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [172.17.0.4]

TASK [build a docker image with deployed war file] *****
changed: [172.17.0.4]

TASK [create a container using cicd-project-ansible image] *****
changed: [172.17.0.4]

PLAY RECAP *****
172.17.0.4      : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker images
REPOSITORY          TAG          IMAGE ID       CREATED        SIZE
cicd-project-ansible latest       dee66b54404e   9 minutes ago  435MB
tomcat              9.0         3740ba5d8885   3 weeks ago    427MB

[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker ps -a
CONTAINER ID        IMAGE               COMMAND          CREATED           STATUS            PORTS            NAMES
62a4be2e2604       cicd-project-ansible "catalina.sh run" 15 seconds ago   Up 14 seconds    0.0.0.0:8080->8080/tcp  my_cicd_project

[root@ee81181ccfb4 ~]#

```

9. 8번 항목을 jenkins에서 실행하도록 설정

- item 구성 설정 > 빌드 후 조치 > Exec command
 - `ansible-playbook -i hosts first-devops-playbook.yml` 입력 후 저장
- 빌드 진행 후 ansible 서버에서 결과 확인

```

[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker ps -a
CONTAINER ID        IMAGE               COMMAND          CREATED           STATUS            PORTS            NAMES
5b27ed8b4c4e       cicd-project-ansible "catalina.sh run" 37 seconds ago   Up 36 seconds    0.0.0.0:8080->8080/tcp  my_cicd_project

[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker images
REPOSITORY          TAG          IMAGE ID       CREATED        SIZE
cicd-project-ansible latest       a99553ddbaf    44 seconds ago  435MB
tomcat              9.0         3740ba5d8885   3 weeks ago    427MB

[root@ee81181ccfb4 ~]#

```

10. git push 진행 시 자동으로 배포 설정 추가

빌드 유발

☒ Build whenever a SNAPSHOT dependency is built ?

| ☐ Schedule build when some upstream has no successful builds ?

☐ 빌드를 원격으로 유발 (예: 스크립트 사용) ?

☐ Build after other projects are built ?

☐ Build periodically ?

☐ GitHub Branches

☐ GitHub Pull Requests ?

☐ GitHub hook trigger for GITScm polling ?

☒ Poll SCM ?

Schedule ?

* * * * *

⚠ Do you really mean "every minute" when you say "* * * * *"? Perhaps you meant "H * * * *" to poll once per hour

Would last have run at Monday, September 25, 2023 at 4:00:14 PM Coordinated Universal Time; would next run at Monday, September 25, 2023 at 4:00:14 PM Coordinated Universal Time.

☐ Ignore post-commit hooks ?

- 최초 빌드 이후에 동일한 컨테이너 이름으로 컨테이너 존재 시 빌드 실패
 - playbook 내용 수정 (기존 컨테이너, 이미지 삭제)

```
- hosts: all
#  become: true

tasks:
- name: stop current running container
  command: docker stop my_cicd_project
  ignore_errors: yes

- name: remove stopped container
  command: docker rm my_cicd_project
  ignore_errors: yes

- name: remove current docker image
  command: docker rmi cicd-project-ansible
  ignore_errors: yes
```

```
- name: build a docker image with deployed war file
  command: docker build -t cicd-project-ansible .
  args:
    chdir: /root

- name: create a container using cicd-project-ansible image
  command: docker run -d --name my_cicd_project -p 8080:8080 cicd-project-ansible
```

- git push 후 결과 확인
 - 기존 컨테이너가 지워지고 신규 컨테이너가 잘 생성되었음

```
[root@ee81181ccfb4 ~]# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
5b27ed8b4c4e   cicd-project-ansible "catalina.sh run"       14 minutes ago Up 14 minutes  0.0.0.0:8080->8080/tcp   my_cicd_project
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
36e4a7bcbf83   cicd-project-ansible "catalina.sh run"       15 seconds ago Up 14 seconds  0.0.0.0:8080->8080/tcp   my_cicd_project
[root@ee81181ccfb4 ~]#
```



11. 새로운 playbook 작성

- docker image를 docker hub로 업로드 후 업로드 된 이미지를 가져와서 배포 진행
- 기존 docker image에 tag 붙여서 신규 이미지 생성
 - `docker tag cicd-project-ansible aheeej/cicd-project-ansible`
- docker 계정 로그인 > `docker login`

- docker image push > `docker push aheeej/cicd-project-ansible`

```
[root@ee81181ccfb4 ~]# docker images
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
cicd-project-ansible latest      30101680bceb  21 hours ago  435MB
tomcat               9.0        3740ba5d8885  3 weeks ago  427MB
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker tag cicd-project-ansible aheeej/cicd-project-ansible
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker images
REPOSITORY          TAG         IMAGE ID      CREATED       SIZE
aheeej/cicd-project-ansible latest      30101680bceb  21 hours ago  435MB
cicd-project-ansible latest      30101680bceb  21 hours ago  435MB
tomcat               9.0        3740ba5d8885  3 weeks ago  427MB
[root@ee81181ccfb4 ~]# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: aheeej@gmail.com
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# docker push aheeej/cicd-project-ansible
Using default tag: latest
The push refers to repository [docker.io/aheeej/cicd-project-ansible]
2e9c6126dd61: Pushed
0c2f5aa7ca09: Mounted from library/tomcat
961f04b4bdd8: Mounted from library/tomcat
2a65c99e8925: Mounted from library/tomcat
ca89f0b54994: Mounted from library/tomcat
2753bf99b948: Mounted from library/tomcat
b3fa8c246901: Mounted from library/tomcat
ecec36d8cc35: Mounted from library/tomcat
dc0585a4b8b7: Mounted from library/tomcat
latest: digest: sha256:ebc3ddd8a086bda9c7623d0c200ef51dc7be67a9dc8c8baa9175a65bfc9d79c1 size: 2206
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]#
```

- playbook 생성 (create-cicd-devops-image.yml)
 - 결과값을 생성하고, 생성된 결과값을 hub로 push한 뒤 결과값 삭제

```
- hosts: all
#   become: true

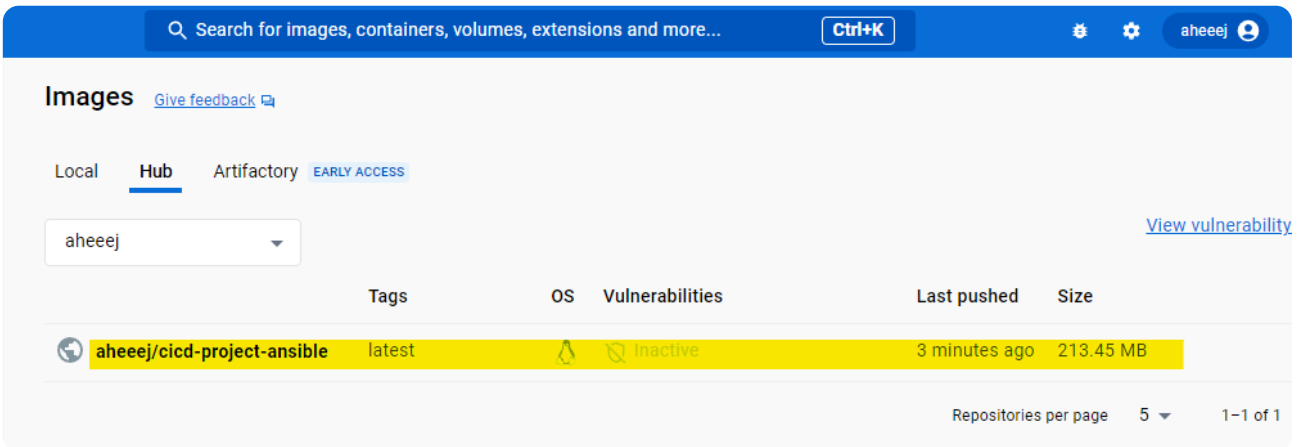
tasks:
- name: create a docker image with deployed waf file
  command: docker build -t aheeej/cicd-project-ansible .
  args:
    chdir: /root

- name: push the image on Docker Hub
  command: docker push aheeej/cicd-project-ansible

- name: remove the docker image from the ansible server
  command: docker rmi aheeej/cicd-project-ansible
  ignore_errors: yes
```

- playbook 실행 및 push 결과 확인
 - `ansible-playbook -i hosts create-cicd-devops-image.yml`

- hosts 파일에는 ansible 서버만 포함되어 있음



- 추가 playbook 파일 생성 (create-cicd-project-container-playbook.yml)
 - push한 이미지를 ssh 서버로 가지고 와서 컨테이너 생성 예정
 - ssh 서버의 docker 기동 및 컨테이너, 이미지 전부 삭제

```
- hosts: all
#   become: true

tasks:
- name: stop current running container
  command: docker stop my_cicd_project
  ignore_errors: yes

- name: remove stopped container
  command: docker rm my_cicd_project
  ignore_errors: yes

- name: remove current docker image
  command: docker rmi aheej/cicd-project-ansible
  ignore_errors: yes

- name: pull the newest docker image from Docker Hub
  command: docker pull aheej/cicd-project-ansible

- name: create a container using cicd-project-ansible image
  command: docker run -d --name my_cicd_project -p 8080:8080
aheej/cicd-project-ansible
```

- ansible 서버 hosts 파일에 ssh 서버 ip 추가

```
[root@ee81181ccfb4 ~]#
[root@ee81181ccfb4 ~]# cat hosts
172.17.0.3
172.17.0.4
[root@ee81181ccfb4 ~]#
```

- 첫번째 playbook 실행
 - 이미지 생성/push/삭제 작업은 ansible 서버에서 진행 (172.17.0.3)
 - `ansible-playbook -i hosts create-cicd-devops-image.yml --limit 172.17.0.3`

```
[root@ee81181ccfb4 ~]# ansible-playbook -i hosts create-cicd-devops-image.yml --limit 172.17.0.3

PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [172.17.0.3]

TASK [create a docker image with deployed waf file] *************************
changed: [172.17.0.3]

TASK [push the image on Docker Hub] *********************************************
changed: [172.17.0.3]

TASK [remove the docker image from the ansible server] *********************
changed: [172.17.0.3]

PLAY RECAP *********************************************************************
172.17.0.3      : ok=4   changed=3   unreachable=0   failed=0   skipped=0   rescued=0   ignored=0
```

- 두번째 playbook 실행
 - 기존 컨테이너/이미지 중지, 삭제 후 hub image로 신규 컨테이너 생성 ssh 서버에서 진행
 - `ansible-playbook -i hosts create-cicd-project-container-playbook.yml -limit 172.17.0.4`
 - 최초 배포이기 때문에 중지, 삭제 자원이 없어 에러 발생 후 신규 자원 생성 완료

```
[root@ee81181ccfb4 ~]# ansible-playbook -i hosts create-cicd-project-container-playbook.yml --limit 172.17.0.4

PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [172.17.0.4]

TASK [stop current running container] *********************************************
fatal: [172.17.0.4]: FAILED! => {"changed": true, "cmd": ["docker", "stop", "my_cicd_project"], "delta": "0:00:00.022220", "end": "2023-09-26 13:44:28.287462", "msg": "non-zero return code", "rc": 1, "start": "2023-09-26 13:44:28.265262", "stderr": "Error response from daemon: No such container: my_cicd_project", "stderr_lines": ["Error response from daemon: No such container: my_cicd_project"], "stdout": "", "stdout_lines": []}
...ignoring

TASK [remove stopped cotainer] *************************************************
fatal: [172.17.0.4]: FAILED! => {"changed": true, "cmd": ["docker", "rm", "my_cicd_project"], "delta": "0:00:00.020945", "end": "2023-09-26 13:44:28.633283", "msg": "non-zero return code", "rc": 1, "start": "2023-09-26 13:44:28.612338", "stderr": "Error: No such container: my_cicd_project", "stderr_lines": ["Error: No such container: my_cicd_project"], "stdout": "", "stdout_lines": []}
...ignoring

TASK [remove current docker image] *********************************************
fatal: [172.17.0.4]: FAILED! => {"changed": true, "cmd": ["docker", "rmi", "aheeej/cicd-project-ansible"], "delta": "0:00:00.021368", "end": "2023-09-26 13:44:28.982149", "msg": "non-zero return code", "rc": 1, "start": "2023-09-26 13:44:28.960781", "stderr": "Error: No such image: aheeej/cicd-project-ansible", "stderr_lines": ["Error: No such image: aheeej/cicd-project-ansible"], "stdout": "", "stdout_lines": []}
...ignoring

TASK [pull the newestest docker image from Docker Hub] ************************
changed: [172.17.0.4]

TASK [create a container using cicd-project-ansible image] ********************
changed: [172.17.0.4]

PLAY RECAP *********************************************************************
172.17.0.4      : ok=6   changed=5   unreachable=0   failed=0   skipped=0   rescued=0   ignored=3
```

12. 위에서 테스트한 내용을 jenkins에서 실행

- 빌드 후 조치 내용 추가

빌드 후 조치

Send build artifacts over SSH ?

SSH Publishers

SSH Server

Name ?

ansible-host

고급 ▼

Transfers

Transfer Set

Source files ?

target/*.war

Remove prefix ?

target

Remote directory ?

.

Exec command ?

ansible-playbook -i hosts create-cicd-devops-image.yml --limit 172.17.0.3;
ansible-playbook -i hosts create-cicd-project-container-playbook.yml --limit 172.17.0.4;

- 배포 진행 및 결과 확인

- jenkins

```
[JENKINS] Recording test results
[INFO]
[INFO] --- war:3.2.2:war (default-war) @ web ---
[INFO] Packaging webapp
[INFO] Assembling webapp [web] in [/var/jenkins_home/workspace/My-Ansible-Project/target/hello-world]
[INFO] Processing war project
[INFO] Copying webapp resources [/var/jenkins_home/workspace/My-Ansible-Project/src/main/webapp]
[INFO] Webapp assembled in [38 msecs]
[INFO] Building war: /var/jenkins_home/workspace/My-Ansible-Project/target/hello-world.war
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 6.190 s
[INFO] Finished at: 2023-09-26T14:00:53Z
[INFO] -----
Waiting for Jenkins to finish collecting data
[JENKINS] Archiving /var/jenkins_home/workspace/My-Ansible-Project/pom.xml to com.njonecompany.web/web/1.0/web-1.0.pom
[JENKINS] Archiving /var/jenkins_home/workspace/My-Ansible-Project/target/hello-world.war to com.njonecompany.web/web/1.0/web-1.0.war
channel stopped
SSH: Connecting from host [eb0201ac5fe0]
SSH: Connecting with configuration [ansible-host] ...
SSH: EXEC: completed after 40,046 ms
SSH: Disconnecting configuration [ansible-host] ...
SSH: Transferred 1 file(s)
Finished: SUCCESS
```

- docker hub

Images
[Give feedback](#)

Local
Hub
Artifactory
EARLY ACCESS

[View vulneral](#)

	Tags	OS	Vulnerabilities	Last pushed	Size
aheeej/cicd-project-ansible	latest		Inactive	2 minutes ago	213.45 MB

- ssh 서버 내 자원 생성 확인

```
[root@23217d9995c1 ~]# docker ps -a
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NAMES
f93444af3042   aheeej/cicd-project-ansible         "catalina.sh run"       3 minutes ago Up 3 minutes  0.0.0.0:8080->8080/tcp              my_cicd_project
[root@23217d9995c1 ~]#
[root@23217d9995c1 ~]#
[root@23217d9995c1 ~]# docker images
REPOSITORY          TAG         IMAGE ID      CREATED        SIZE
aheeej/cicd-project-ansible   latest      b63f487ac80b  4 minutes ago  435MB
[root@23217d9995c1 ~]#
[root@23217d9995c1 ~]#
```