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CI/CD Deployment Using Ansible CM Tool

DESCRIPTION

You are a DevOps engineer at XYZ Ltd. Your company is working on a Java application and wants to automate WAR file artifact deployment so that they don't have to perform WAR deployment on Tomcat/Jetty web containers. Automate Ansible integration with Jenkins CI server so that we can run and execute playbooks to deploy custom WAR files to a web container and then perform restart for the web container.

Steps to Perform:

1. Configure Jenkins server as Ansible provisioning machine
2. Install Ansible plugins in Jenkins CI server
3. Prepare Ansible playbook to run Maven build on Jenkins CI server
4. Prepare Ansible playbook to execute deployment steps on the remote web container with restart of the web container post deployment

1. Install Jenkins

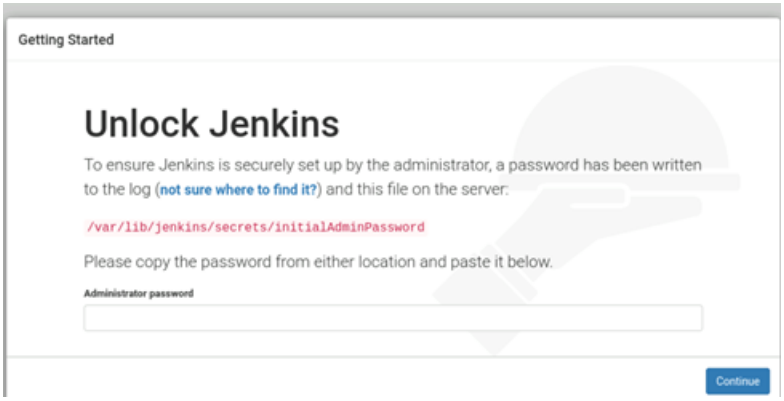
```
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$ wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo apt-key add -
OK
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$ sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable binary/ > /etc/apt/sources.list.d/jenkins.list'
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$ sudo apt update
Hit:1 http://azure.archive.ubuntu.com/ubuntu xenial InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu xenial-updates InRelease [109 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu xenial-backports InRelease [107 kB]
Get:4 http://dl.google.com/linux/chrome/deb stable InRelease [1,811 B]
Hit:5 http://repo.zabbix.com/zabbix/3.2/ubuntu xenial InRelease
Get:7 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 kB]
Hit:8 http://ppa.launchpad.net/ansible/ansible/ubuntu xenial InRelease
Get:9 http://apt.puppetlabs.com bionic InRelease [143 kB]
Hit:10 http://ppa.launchpad.net/certbot/certbot/ubuntu xenial InRelease
```

```
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$ sudo apt install jenkins
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  liblua5.2-0 libreadline7 libssl1.0.2 libtcl8.6 vim-gui-common
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  daemon
The following NEW packages will be installed:
  daemon jenkins
0 upgraded, 2 newly installed, 0 to remove and 318 not upgraded.
Need to get 69.8 MB of archives.
After this operation, 72.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
```

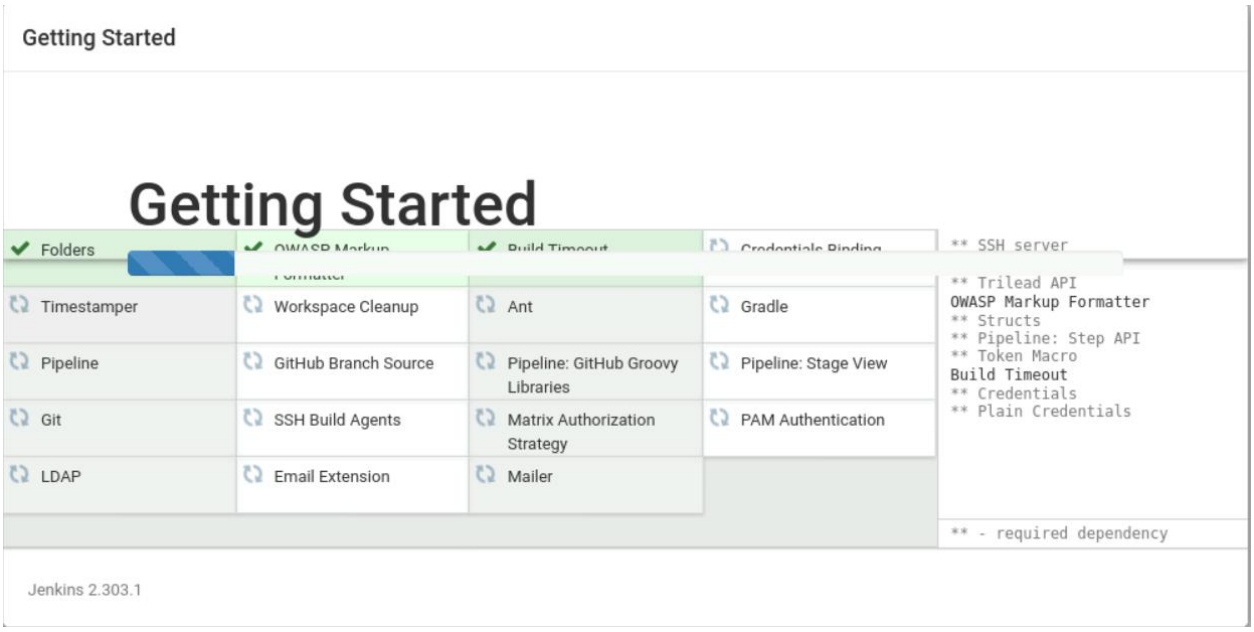
1.1 Check service status –

```
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$ sudo systemctl status jenkins
● jenkins.service - LSB: Start Jenkins at boot time
   Loaded: loaded (/etc/init.d/jenkins; bad; vendor preset: enabled)
   Active: active (exited) since Sat 2021-08-28 19:21:24 UTC; 2min 25s ago
     Docs: man:systemd-sysv-generator(8)

Aug 28 19:21:22 raghu1csanjaygm systemd[1]: Starting LSB: Start Jenkins at boot time...
Aug 28 19:21:22 raghu1csanjaygm jenkins[1465]: Correct java version found
Aug 28 19:21:22 raghu1csanjaygm jenkins[1465]:  * Starting Jenkins Automation Server jenkins
Aug 28 19:21:22 raghu1csanjaygm su[1526]: Successful su for jenkins by root
Aug 28 19:21:22 raghu1csanjaygm su[1526]: + ??? root:jenkins
Aug 28 19:21:22 raghu1csanjaygm su[1526]: pam_unix(su:session): session opened for user jenkins by (uid=0)
Aug 28 19:21:24 raghu1csanjaygm jenkins[1465]:    ...done.
Aug 28 19:21:24 raghu1csanjaygm systemd[1]: Started LSB: Start Jenkins at boot time.
raghu1csanjaygm@raghu1csanjaygm:~/Desktop/ChefPuppetAnsible/Ansible$
```

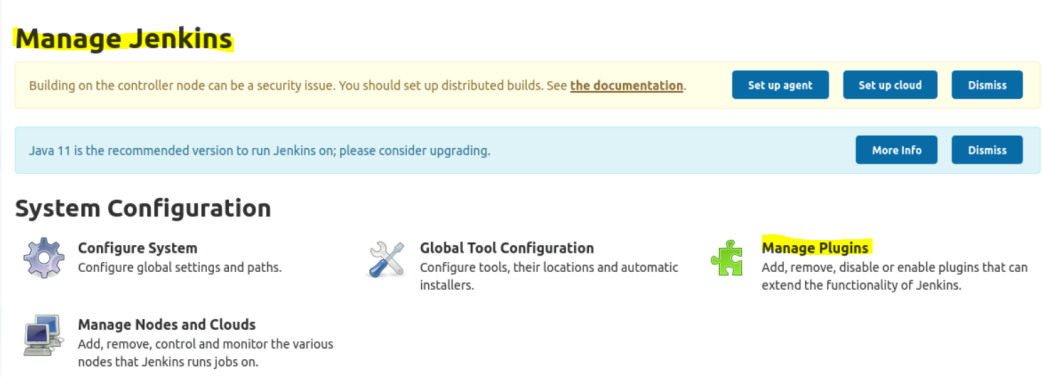
1.2 Setup Jenkins for first use post installation –



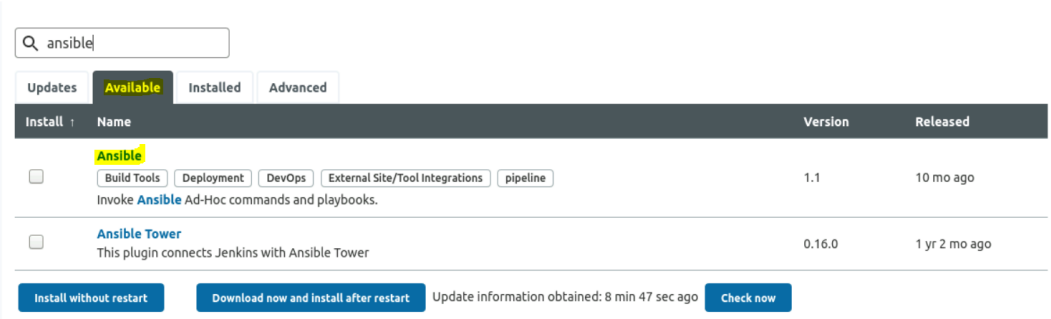
1.3 Install suggested plugins



1.4 Manage Jenkins – Manage Plugins



2. Install Ansible Plugin



2.1 Install ansible on localhost and apache2 on remote server.

```
sudo apt install ansible

sudo apt install apache2
```

2.2 Configure /etc/ansible/hosts

```
jenkins@ip-172-31-4-62:~$
jenkins@ip-172-31-4-62:~$ sudo tail /etc/ansible/hosts
# Here's another example of host ranges, this time there are no
# leading 0s:

#db-[99:101]-node.example.com

[local]
localhost

[remote]
ec2-3-235-121-213.compute-1.amazonaws.com
jenkins@ip-172-31-4-62:~$
```

2.3 Setup password-less connectivity for Jenkins user.

```
ssh-keygen

ssh-copy-id -i /root/.ssh/id_rsa.pub jenkins@ip-172-31-10-19
```

2.4 Add below in /etc/sudoers for Jenkins user to avoid password prompt while using sudo –

```
jenkins ALL=(ALL) NOPASSWD:ALL
```

2.5 Perform ping test for remote –

```
jenkins@ip-172-31-4-62:~$
jenkins@ip-172-31-4-62:~$ ansible remote -m ping
ec2-3-235-121-213.compute-1.amazonaws.com | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
jenkins@ip-172-31-4-62:~$
jenkins@ip-172-31-4-62:~$
```

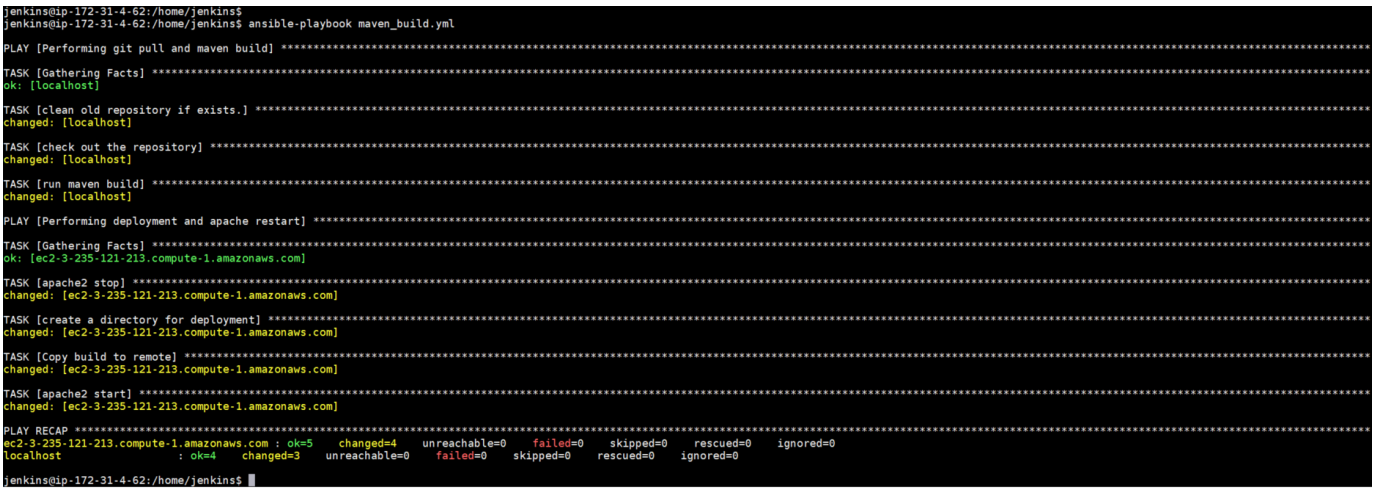
2.6 Run a sample job on remote server –

```
jenkins@ip-172-31-4-62:~$
jenkins@ip-172-31-4-62:~$ ansible remote -m file -a 'name=/tmp/file.txt state=touch'
ec2-3-235-121-213.compute-1.amazonaws.com | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "dest": "/tmp/file.txt",
    "gid": 1001,
    "group": "jenkins",
    "mode": "0664",
    "owner": "jenkins",
    "size": 0,
    "state": "file",
    "uid": 1001
}
jenkins@ip-172-31-4-62:~$
```

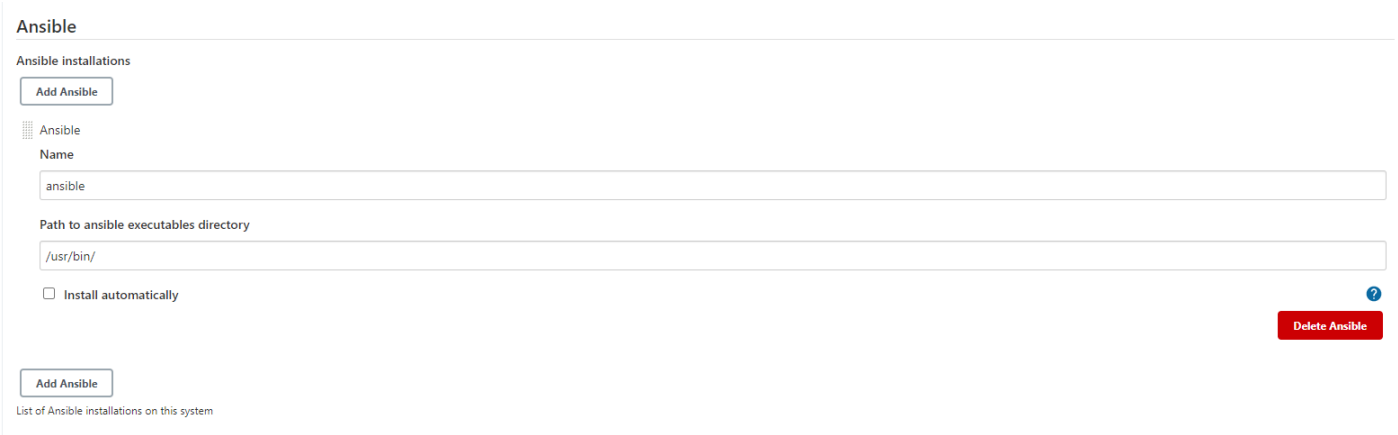
3. Write maven_build.yaml to perform build action –

```
- name: Performing git pull and maven build
  hosts: local
  tasks:
    - name: clean old repository if exists.
      file: name=/home/jenkins/maven state=absent

    - name: check out the repository
      command: git clone https://github.com/sanjayraghuwanshi/simple-java-maven-app.git /home/jenkins/maven

    - name: run maven build
      command: mvn -f /home/jenkins/maven/pom.xml clean package

- name: Performing deployment and apache restart
  hosts: remote
  become: yes
  become_method: sudo

  tasks:
    - name: apache2 stop
      service: name=apache2 state=stopped

    - name: create a directory for deployment
      file: name=/var/www/html/deployment state=directory

    - name: Copy build to remote
      copy:
         src: /home/jenkins/maven/target/my-app-1.0-SNAPSHOT.jar
         dest: /var/www/html/deployment

    - name: apache2 start
      service: name=apache2 state=started
```

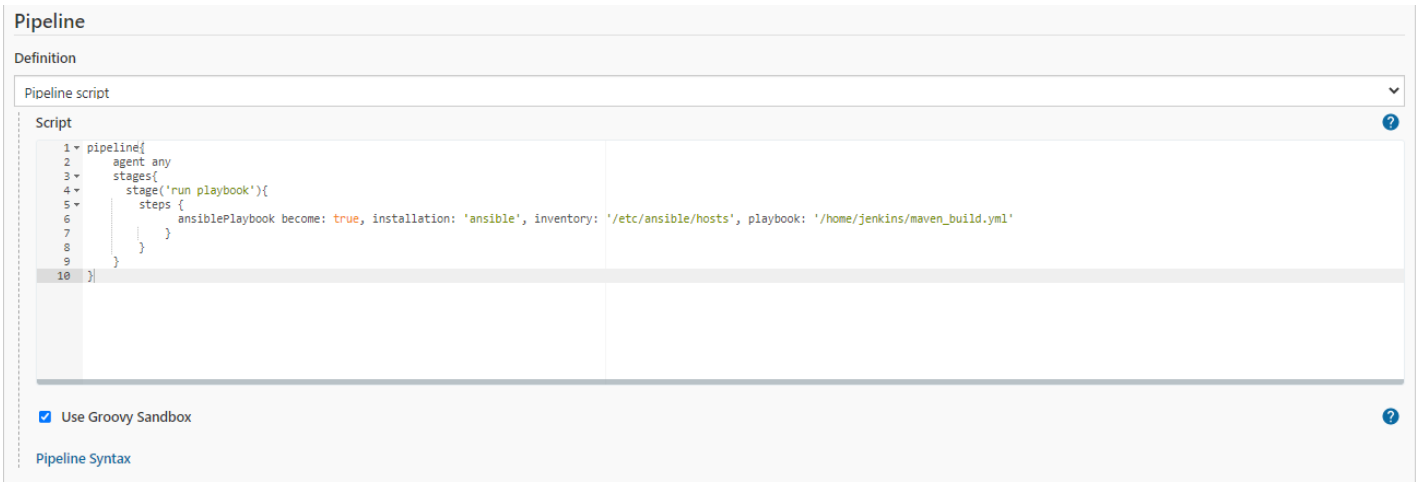
3.1 Run maven build and check the status on remote –



3.2 Add ansible tool in the Jenkins global tools configuration –

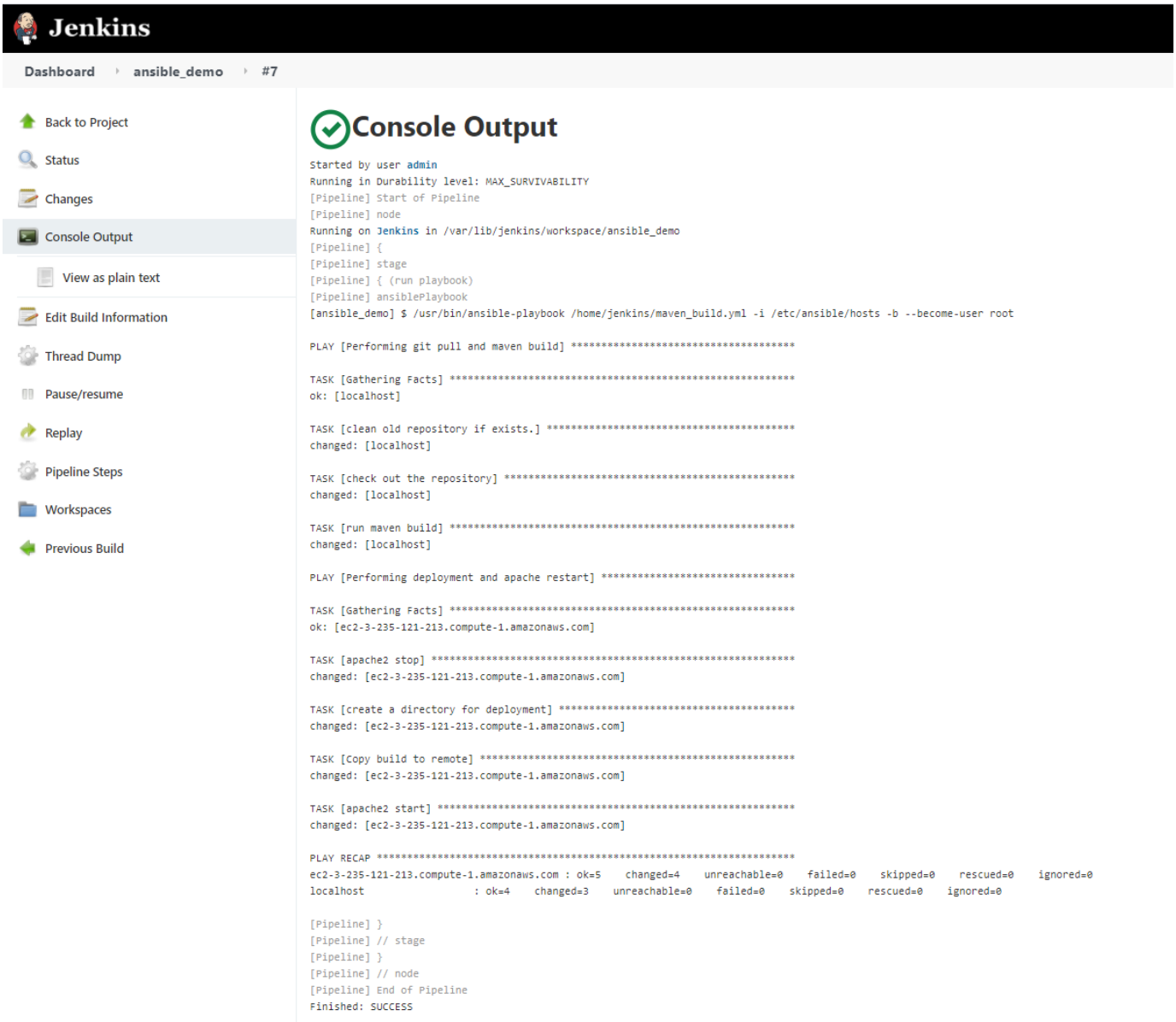


3.3 Write a pipeline to execute ansible playbook with the help of pipeline syntax –

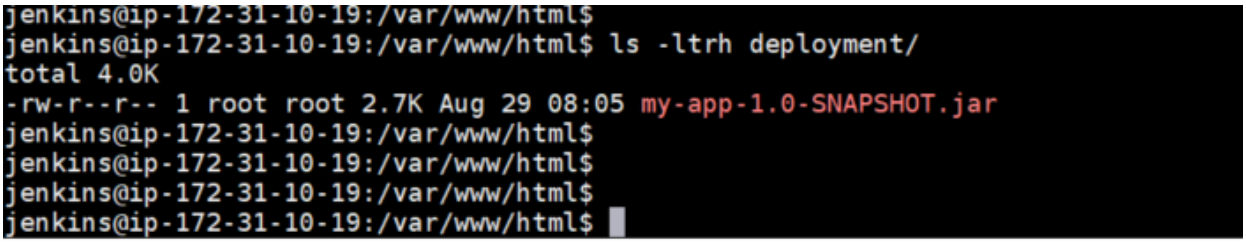


```
pipeline{
        agent any
        stages{
          stage('run playbook'){
                steps {
                      ansiblePlaybook become: true, installation: 'ansible', inventory:
'/etc/ansible/hosts', playbook: '/home/jenkins/maven_build.yml'
                          }
                }
        }
}
```

4. Executed Ansible playbook via Jenkins –



4.1 Check if file deployed on remote server –



Status - build deployed successfully.

Thanks.

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