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I am using git, maven, Jenkins, tomcat, ansible, docker for my projrcts

DEVOPS PROJECTS

# **Simple DevOps Project -01**

We know how to use work with each and Git, Jenkins independently. What if you want to collaborate these two? that is where Simple DevOps project helps you. Follow below steps if you are a new guy to DevOps. You love it.

#### Prerequisites

1. EC2 instance with tomcat installation
2. Jenkins server

### Part-01 : Adding steps for Integration

### Steps to create Jenkin job

1. Login to Jenkins console
2. Create Jenkins job, Fill the following details,
   * Source Code Management:
     + Repository: https://github.com/ValaxyTech/hello-world.git
     + Branches to build : \*/master
   * Build:
     + Root POM:pom.xml
     + Goals and options : clean install package

### Part-02: Adding Deployment Steps

in this port we are going to install 'deploy to container' plugin. this is need to deploy on tomcat server which we are using.

* Install maven plugin without restart
  + Manage Jenkins > Jenkins Plugins > available > deploy to container

To deploy our build artifacts on tomcat server our Jenkins server need access. For this we should setup credentials. This option is available in Jenkins home page

* setup credentials
  + credentials > jenkins > Global credentials > add credentials
    - Username : deployer
    - Password : XXXXXXX
    - id : Tomcat\_user
    - Description: Tomcat user to deploy on tomcat server

Modify the same job which created in part-01 and add deployment steps.

* Post Steps
  + Deploy war/ear to container
    - WAR/EAR files : \*\*/\*.war
    - Containers : Tomcat 8.x
      * Credentials: Tomcat\_user (which created in above step)
      * Tomcat URL : http://<PUBLIC\_IP>:<PORT\_NO>

Save and run the job now.

### Port-03 : Continuous Integration & Continuous Deployment (CI/CD)

Now job is running fine but to make this as Continuous Integration and Continuous Deployment Tod do that go back and modify job as below.

* Build Triggers
  + Poll SCM
    - schedule \*/2 \* \* \* \*

Save the job and modify the code in GitHub. Then you could see your job get trigger a build without any manual intervention.

# Simple DevOps Project -02

### Prerequisites:

1. Ansible server
2. Jenkins Server
3. Tocmat Server

### Part-01 Integration Setps

Install "publish Over SSH"

* Manage Jenkins > Manage Plugins > Available > Publish over SSH

Enable connection between Ansible and Jenkins

* Manage Jenkins > Configure System > Publish Over SSH > SSH Servers
  + SSH Servers:
    - Hostname:<ServerIP>
    - username: ansadm
    - password: \*\*\*\*\*\*\*

Test the connection "Test Connection"

### Part-02 - Execute job to connect

create a copywarfile.yml on Ansible under /opt/playbooks

# copywarfile.yml

---

- hosts: all

become: true

tasks:

- name: copy jar/war onto tomcat servers

copy:

src: /op/playbooks/wabapp/target/webapp.war

dest: /opt/apache-tomcat-8.5.32/webapps

Add tomcat server details to /etc/ansible/hosts (if you are using other hosts file update server info there)

echo "<server\_IP>" >> /etc/ansible/hosts

Create Jenkins job, Fill the following details,

* Source Code Management:
  + Repository: https://github.com/ValaxyTech/hello-world.git
  + Branches to build : \*/master
* Build:
  + Root POM:pom.xml
  + Goals and options : clean install package
* Add post-build steps
  + Send files or execute commands over SSH
    - SSH Server : ansible\_server
    - Source fiels: webapp/target/\*.war
    - Remote directory: //opt//playbooks
* Add post-build steps
  + Send files or execute commands over ssH
    - SSH Server : ansible\_server
    - Exec command ansible-playbook /opt/playbooks/copywarfile.yml

Execute job and you should be able to seen build has been deployed on Tomcat server.

**Simple DevOps Project -3**

1. Launch an EC2 instance for Docker host
2. Install docker on EC2 instance and start services

yum install docker

service docker start

1. create a new user for Docker management and add him to Docker (default) group

useradd dockeradmin

passwd dockeradmin

usermod -aG docker dockeradmin

1. Write a Docker file under /opt/docker

mkdir /opt/docker

### vi Dockerfile

# Pull base image

From tomcat:8-jre8

# Maintainer

MAINTAINER "valaxytech"

# copy war file on to container

COPY ./webapp.war /usr/local/tomcat/webapps

1. Login to Jenkins console and add Docker server to execute commands from Jenkins  
   Manage Jenkins --> Configure system --> Publish over SSH --> add Docker server and credentials
2. Create Jenkins job

A) Source Code Management  
Repository : <https://github.com/ValaxyTech/hello-world.git>  
Branches to build : \*/master

B) Build Root POM: pom.xml  
Goals and options : clean install package

C) send files or execute commands over SSH Name: docker\_host  
Source files : webapp/target/\*.war Remove prefix : webapp/target Remote directory : //opt//docker  
Exec command[s] :

docker stop valaxy\_demo;

docker rm -f valaxy\_demo;

docker image rm -f valaxy\_demo;

cd /opt/docker;

docker build -t valaxy\_demo .

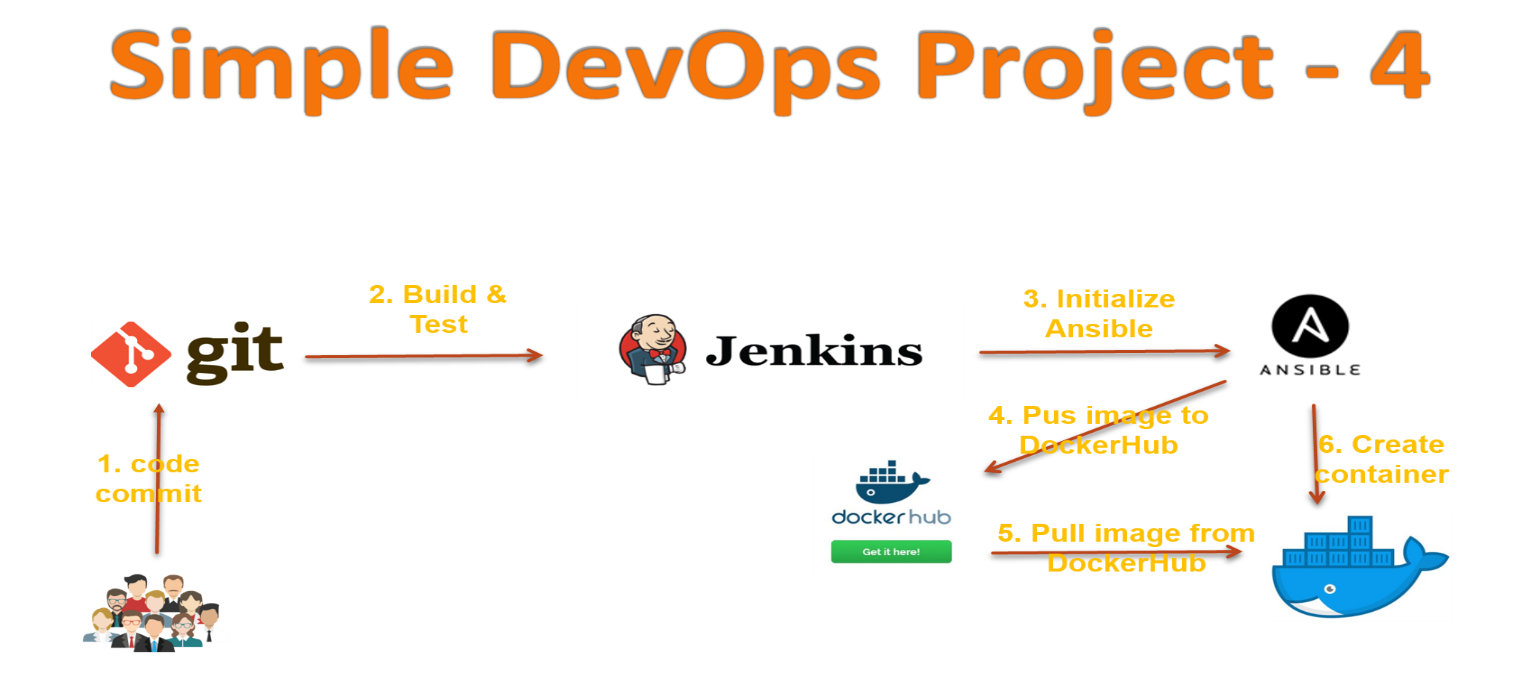
D) send files or execute commands over SSH  
Name: docker\_host  
Exec command : docker run -d --name valaxy\_demo -p 8090:8080 valaxy\_demo

1. Login to Docker host and check images and containers. (no images and containers)
2. Execute Jenkins job
3. check images and containers again on Docker host. This time an image and container get creates through Jenkins job
4. Access web application from browser which is running on container

<docker\_host\_Public\_IP>:8090

# Simple DevOps Project - 4

In this project, we will be see how to use Git, Jenkins, Ansible, DockerHub, Docker to DEPLOY on a docker container.,

[](https://github.com/ValaxyTech/DevOpsDemos/blob/master/SimpeDevOpsProjects/images/Project-4.png)

#### PreRequisites

1. Jenkins
2. Ansible
3. Setup ansible client and install docker
4. Docker Hub account

In part-01 we create Docker image on ansible server through Jenkins job and pushed it onto DockerHub.

### Part-01 : Create an docker image

1. Login to Jenkins console
2. Create Jenkins job, Fill the following details,
   * Source Code Management:
     + Repository : https://github.com/ValaxyTech/hello-world.git
     + Branches to build : \*/master
   * Build:
     + Root POM:pom.xml
     + Goals and options : clean install package
   * Post Steps
     + Send files or execute commands over SSH
       - Name: ansible\_server
       - Source files : webapp/target/\*.war
       - Remove prefix : webapp/target
       - Remote directory : //opt//docker
     + Send files or execute commands over SSH
       - Name: ansible\_server
       - Source files : Dockerfile
       - Remote directory : //opt//docker
       - Exec Command:
         * cd /opt/docker
         * docker build -t valaxy\_demo .
         * docker tag valaxy\_demo valaxy/valaxy\_demo
         * docker push valaxy/valaxy\_demo
         * docker rmi valaxy\_demo valaxy/valaxy\_demo
3. Login to Docker host and check images and containers. (no images and containers)
4. login to docker hub and check. shouldn't find images with for valaxy\_demo
5. Execute Jenkins job
6. check images in Docker hub. Now you could able to see new images pushed to Valaxy Docker\_Hub

#### Troubleshooting:

1. Docker should be installed on ansible server
2. Should login to "docker hub" on ansible server
3. ansadmin user should be part of docker group

In Part-02 we create create\_docker\_container.yml playbook. this get intiated by jenkins job, run by ansible and exected on dokcer\_host

### Part-02 : Deploy Containers

1. Write a yml file to create a container (file name : create\_docker\_container.yml)
2. ---
3. - hosts: web-servers
4. become: true
5. tasks:
6. - name: stop previous version docker
7. shell: docker stop valaxy\_demo
8. - name: remove stopped container
9. shell: docker rm -f valaxy\_demo
10. - name: remove docker images
11. shell: docker image rm -f valaxy/valaxy\_demo
13. - name: create docker image
14. shell: docker run -d --name valaxy\_demo -p 8090:8080 valaxy/valaxy\_demo
15. Add this script to Jenkins job.
    * Chose "configure" to modify your jenkins job.
      + Under post build actions
        - Send files or execute commands over SSH
          * Exec Command:
        - cd /opt/playbooks

ansible-playbook create\_docker\_container.yml

1. Execute Jenkins job.
2. You could see a new container on your docker host. can able access it from browser on port 8090

Troubleshooting: Makesure you have opened required ports on AWS Security group for this server.

In Part-03 we try to improvise to store docker images previous versions

### Part-03 : Deploy with Version Control Containers

So for we used latest docker image to build a container, but what happens if latest version is not working?  
One easiest solution is, maintaining version for each build. This can be achieved by using environment variables.

here we use 2 variables

* BUILD\_ID - The current build id
* JOB\_NAME - Name of the project of this build. This is the name you gave your job when you first set it up.

for more info Please refer [this URL](https://wiki.jenkins.io/display/JENKINS/Building+a+software+project)

Lets modify jenkins job which was created in Part-01 as below.

1. Create Jenkins job
   * Source Code Management:
     + Repository : https://github.com/ValaxyTech/hello-world.git
     + Branches to build : \*/master
   * Build:
     + Root POM:pom.xml
     + Goals and options : clean install package
   * Send files or execute commands over SSH
     + Name: ansible\_server
     + Source files : webapp/target/\*.war
     + Remove prefix : webapp/target
     + Remote directory : //opt//docker
   * Send files or execute commands over SSH
     + Name: ansible\_server
     + Source files : Dockerfile
     + Remote directory : //opt//docker
       - cd /opt/docker
       - docker build -t $JOB\_NAME:v1.$BUILD\_ID .
       - docker tag $JOB\_NAME:v1.$BUILD\_ID valaxy/$JOB\_NAME:v1.$BUILD\_ID
       - docker tag $JOB\_NAME:v1.$BUILD\_ID valaxy/$JOB\_NAME:latest
       - docker push valaxy/$JOB\_NAME:v1.$BUILD\_ID
       - docker push valaxy/$JOB\_NAME:latest
       - docker rmi $JOB\_NAME:v1.$BUILD\_ID valaxy/$JOB\_NAME:v1.$BUILD\_ID
       - valaxy/$JOB\_NAME:latest

##### References

[1] - [Jenkins Docs - Building Software Projects](https://wiki.jenkins.io/display/JENKINS/Building+a+software+project)