



Testing in DevOps

DOu – Certified Tester in DevOps (CTD)
Exercise Solutions

HO-2.3.1(HO-0)

Exercise - Demonstrate how to integrate a static analysis tool into DevOps pipeline

- Add PMD stage in jenkins pipeline and trigger the jenkins build. Discuss pmd reports.

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Exercise Solution - Demonstrate how to integrate a static analysis tool into DevOps pipeline

- Make sure you are already logged in Jenkins and be on Dashboard UI
- Add following stages in Jenkinsfile.txt on local machine:
 - **Clean**
 - **PMD**

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Add Stage – Clean

1. **Clean** defines a stage that appears on the Jenkins UI
2. **sh** runs the Maven command to cleanly target folder that includes code compiled classes, unit test reports, war files etc
3. **Note:** It will delete **target** folder from **var/jenkins_home/workspace/<your pipeline project name>**

```
pipeline {
    agent any
    stages {
        //Code starts for stage Clean
        stage('Clean') {
            steps {
                sh 'mvn clean'
            }
        }
        //Code ends for stage Clean
    }
}
```

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Add Stage – PM

1. PMD defines a stage that appears on the Jenkins UI
2. **sh** runs the Maven command to detect programming mistake detector

```
//Code starts for stage PMD
stage('PMD') {                (1)
    steps {
        sh 'mvn site'          (2)
    }
}

//Code ends for stage PMD
```

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Saving Jenkinsfile & Commit it on GitHub

- Go to verity-devops-ex folder on local machine
- Go inside Reference folder
- Open the Jenkinsfile.txt and copy the respective stages code from there and close the file
- Come out side from the Reference folder
- Open the Jenkinsfile.txt at verity-devops-ex folder and paste the respective stages code in it under below section

```
// ***** ALL CODE TO BE ADDED BELOW THIS COMMENT *****  
  
// ***** ALL CODE TO BE ADDED ABOVE THIS COMMENT *****
```
- Save and close the Jenkinsfile.txt and commit it to GitHub Web by following steps:
 - Open GitHub Desktop
 - Make sure you are under verity-devops-ex repo, if not then change it from Current repository
 - Jenkinsfile.txt will be highlighted & displayed under Current repository “verity-devops-ex”
 - Select Current branch as “master”, if not already selected
 - Enter Summary comment under “Summary” text box section that is above to “Description” textbox
 - Click “Commit to master” button
 - Click “Push origin” button
 - Once push is done then go to your verity-devops-ex repository on GitHub Web & Refresh the page
 - Changes will be displayed there in Jenkinsfile.txt on github web

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Running The Pipeline

- Go to Jenkins Dashboard
- Build will be triggered automatically because of webhook
- Click Build no. link
- Click Console Output link
- Verify the build result is successful

Note: Code will be available inside container's location **var/jenkins_home/workspace/<your pipeline project name>**

Commands to reach on to code inside the container:

- **sudo docker images** : List all of the images that are currently stored on the system
- **sudo docker container ls -a** : List all of the containers
- **sudo docker exec -it <<container id>> /bin/bash** : Enter inside the running container
- **cd var/jenkins_home/workspace/<your pipeline project name>**
- **ls**

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PMD Result

- You can see result in pmd.html
- You can see pmd result at below location in container:
/var/jenkins_home/workspace/<your pipeline project name>/target/site/pmd.html

PMD Results

The following document contains the results of [PMD 6.8.0](#).

Files

com/expense/controller/ExpenseController.java

Violation	Priority	Line
Avoid excessively long variable names like redirectAttributes	3	140

com/expense/dto/ExpenseDTO.java

Violation	Priority	Line
Avoid variables with short names like id	3	5
Avoid variables with short names like id	3	33

com/expense/entity/Expense.java

Violation	Priority	Line
Avoid variables with short names like id	3	26
Avoid variables with short names like id	3	70

com/expense/entity/User.java

Violation	Priority	Line
Avoid short class names like User	4	27-131
Avoid variables with short names like id	3	30
Avoid variables with short names like id	3	72

com/expense/entity/repository/ExpenseRepository.java

Violation	Priority	Line
Avoid variables with short names like id	3	23

com/expense/securityconfig/SecurityConfig.java

Violation	Priority	Line
Avoid excessively long variable names like userDetailsService	3	22

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Get PMD reports using tomcat

- Create a putty duplicate session(by right clicking on jenkins putty session's white header, click Duplicate Session)
- Run below commands:
 - **sudo apt-get update**
 - **sudo apt-get install tomcat9**
 - **sudo apt-get install tomcat9-admin**
 - **sudo systemctl status tomcat9**

Make sure tomcat server is started(active)

- press ctrl+c from keyboard

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Get PMD reports using tomcat...

- Run below command:
 - **sudo nano /var/lib/tomcat9/conf/tomcat-users.xml**
- tomcat-users.xml file will be opened
- Scroll down the page and go to last under </tomcat-users> tag
- Copy, paste below 3 lines & save the file(by pressing ctrl+x, y, enter)
 - <role rolename="manager-gui"/>
 - <role rolename="admin-gui"/>
 - <user username="admin" password="admin" roles="manager-gui,admin-gui"/>



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Get PMD reports using tomcat...

- Run below command:
 - **sudo nano /var/lib/tomcat9/conf/server.xml**
- server.xml file will be opened
- Change the port 8080 to 9090 in below code in server.xml:

```
<Connector port="9090" protocol="HTTP/1.1"  
    connectionTimeout="20000"  
    redirectPort="8443" />
```

- Save the file(by pressing ctrl+x, y, enter)
- Run below commands:
 - **sudo systemctl restart tomcat9**
 - **sudo systemctl status tomcat9**

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Get PMD reports using tomcat...

- Launch aws ip with port 9090 in browser:
E.g. <http://54.91.194.12:9090/>
- Tomcat home page ui will be displayed on browser
- Click “manager webapp” link
- Login with username → admin, Password → admin
- You will navigate to tomcat web application manager page



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Get PMD reports using tomcat...

- Create a putty duplicate session

- Run below commands:

- **pwd**

- **ls**

- **sudo docker container ls -a**

Note down the container id from above command where jenkins is up & running and mention in below command

- **sudo docker cp <<container id>>:var/jenkins_home/workspace/verity-devops-ex/target/site mysite**

Above command will create the "mysite" folder and move it to "/home/ubuntu" directory

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Get PMD reports using tomcat...

- **ls**
- **sudo mv mysite /var/lib/tomcat9/webapps/**

Above command will move “mysite” folder from “/home/ubuntu” directory to “/var/lib/tomcat9/webapps/” directory

- **ls**
- **cd /var/lib/tomcat9/webapps/**
- **ls**



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Get PMD reports using tomcat...

- Go to tomcat web application manager page on browser
- Refresh the page
- You will see "/mysite" will be displayed under Applications > Path
- Click "/mysite" link
- Click "Project Reports" link at left section in page
- Click "PMD" link
- See the pmd reports on browser