

TCS iON Remote Internships

RIO - 210

Project Name – Develop docker container for scalable Java stack and microservices based applications

Project Objective and Brief

To develop an automated scalable containerized docker based java stack comprising of different API integration using docker compose and its variants.

Project Guidelines

Perform the following activities:

1. Create a docker file with the following specifications as needed to support the following activities for java microservices.

- a) Use base OS as Ubuntu.
- b) Install and configure openJDK. Take care to set environment variables.
- c) Install and configure Apache Tomcat. Open default PORT.
- d) Install and configure Eclipse IDE. Configure Ubuntu in a way so that GUI based IDE can execute.
- e) Install and configure Spring libraries.
- f) Configure and install Spring Boot.
- g) Install and configure Spring Cloud.
- h) Install and configure MySQL. Create one user.

Project Guidelines (contd.)

- i) The Spring microservices libraries and supporting dependencies need to be configured at Tomcat installed earlier. Make necessary changes. Set environmental variables as needed.
 - j) Expose necessary ports, browser.
 - k) Specify a working directory to start.
2. Create a docker image of the docker file created above.
3. Execute the docker image and run Eclipse, configure and attach Tomcat. Run and deploy a simple Spring project to test.
4. Use docker commands to processes and containers running.
5. Create an account in Docker hub. Publish the image in Docker Hub.

Project Guidelines (contd.)

6. Setup a Docker Swarm and perform the following actions:
 - i). Create a Docker Swarm and deploy a service to Docker swarm.
 - ii) Create a swarm cluster with 2 machine instances naming them as master1 and master2.
 - iii) Add a 3rd machine instance master3 to the cluster.
 - iv) Configure the cluster for failover.
 - v) Perform scaling with the Docker CLI commands and test the setup.

7. Make sure Docker Engine and Docker Compose installed. Perform the following activities:
 - i) Use the following specifications to configure Docker Compose.
 - ii) Use separate directories and dockerfile to compose each of the following:
 - a) Use base OS as Ubuntu.
 - b) Install and configure openJDK. Take care to set environment variables.
 - c) Install and configure Apache Tomcat. Open default PORT.
 - d) Install and configure Eclipse IDE. Make sure to configure Ubuntu in a way so that GUI based IDE can execute.

Project Guidelines (contd.)

- e) Install and configure Spring libraries.
 - f) Configure and install Spring Boot.
 - g) Install and configure Spring Cloud.
 - h) Install and configure MySQL. Create a user.
-
- 8. Create a docker-compose.yml file so that all can run together.
 - 9. Start the services and view the status of running services.

TCS iON RIO | Expected Project Outcome

1

Create dynamic docker image with docker compose and its variants and test the same through docker.

2

Setup a Docker Swarm and perform scaling

3

Publish in Docker HUB and integrate and test the same through IDEs.

Hands-on details

Hands-on environment or software required to implement the project (all tools are freeware and open source tools) -

1. Linux
2. Docker CE
3. Docker compose
4. Boot2docker
5. Eclipse Che
6. Java
7. Spring
8. Java EE
9. Hibernate
10. Tomcat
11. MySQL
12. AWS EC2 instance with Amazon Linux