

## Lab 12. Build a Docker Image with DevCS & Push it to OCIR

### Objectives:

- Download and use sample source code for the Building and Deployment.
- Upload the source to Oracle DevCS and build container image using DevCS builder instance. Push this image to OCIR from DevCS

### Pre-Requisite

- A web browser – Google chrome or Microsoft Edge
- An **Oracle Cloud Account** with an active Oracle Developer Cloud Service subscription. It comes with IDCS. Therefore, you should have Admin/Tenancy level access.
- Your Oracle Cloud account credentials
- Git

### Sequence 1. Download a sample source code in your local VM, server.

1. Create a directory and pull sample app by cloning a Github repo for testing

```
# mkdir ~/DockerFlash
# cd ~/DockerFlash
# git clone https://github.com/dockersamples/node-bulletin-board
```

2. Change to the app directory

```
# cd node-bulletin-board/bulletin-board-app
# mv * ~/DockerFlash
# cd ~/DockerFlash
```

3. Check the contents of Dockerfile in the bulletin board application.

```
# ls
# cat Dockerfile
```

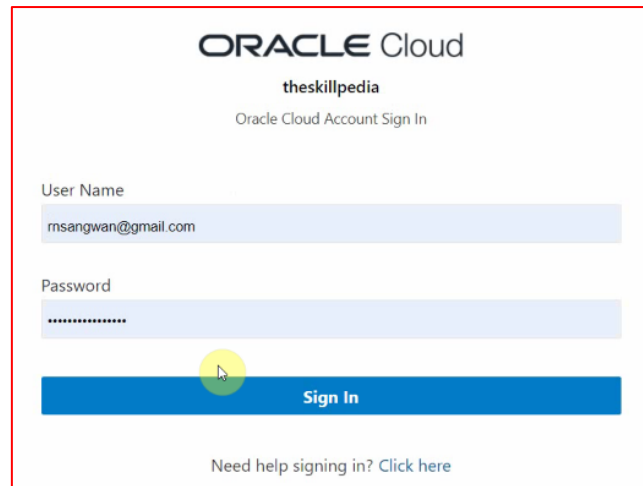
```
FROM node:current-slim
WORKDIR /usr/src/app
COPY package.json .
RUN npm install

EXPOSE 8080
CMD [ "npm", "start" ]

COPY . .
```

### Sequence 2. Login to Oracle DevCS and setup your Build Job

1. Login to Oracle Cloud using IDCS (**not regular OCI account**)



**ORACLE Cloud**  
theskillpedia  
Oracle Cloud Account Sign In

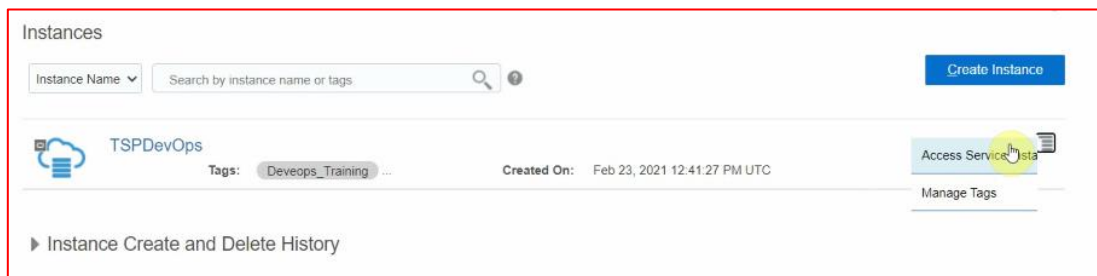
User Name  
msangwan@gmail.com

Password  
\*\*\*\*\*

**Sign In**

Need help signing in? [Click here](#)

- Click on "Access Service Instance" from menu given on right side as given I screen shot.



**Instances**

Instance Name Search by instance name or tags

**Create Instance**

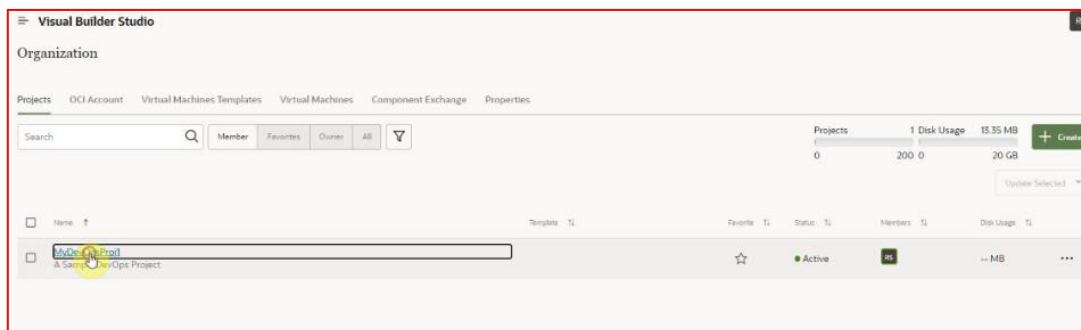
TSPDevOps Tags: DevOps\_Training ... Created On: Feb 23, 2021 12:41:27 PM UTC

**Access Service Instance**

Manage Tags

► Instance Create and Delete History

- Click on the Project you have created earlier. If you have not created a project, create a new project.



**Visual Builder Studio**

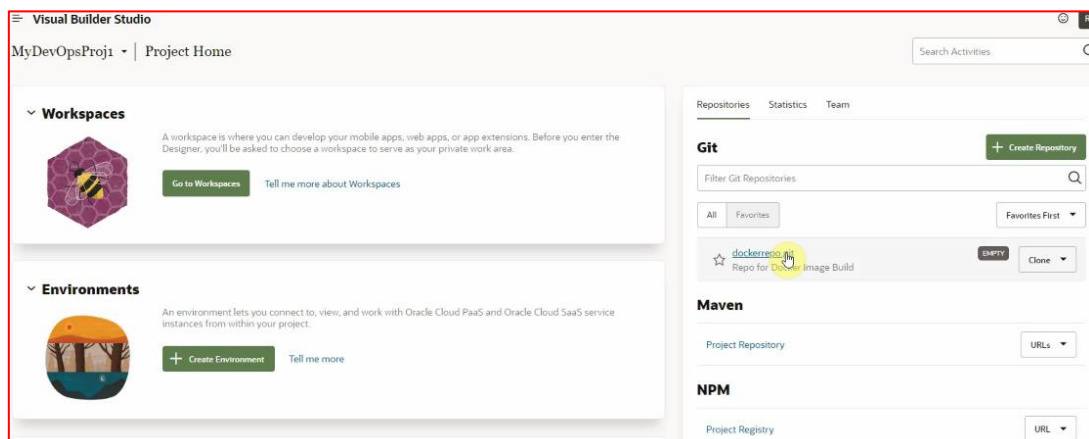
Organization

Projects OCI Account Virtual Machines Templates Virtual Machines Component Exchange Properties

Search Member Favorites Owner All

Name	Template	TS	Favorite	TS	Status	TS	Members	TS	Disk Usage	TS
MyDevOpsProj1					Active				MB	

- Create a repository by clicking on the link give on the right side. If you already have a repo, open it by clicking on its name.



**Visual Builder Studio**

MyDevOpsProj1 | Project Home

Search Activities

**Workspaces**

A workspace is where you can develop your mobile apps, web apps, or app extensions. Before you enter the Designer, you'll be asked to choose a workspace to serve as your private work area.

**Environments**

An environment lets you connect to, view, and work with Oracle Cloud PaaS and Oracle Cloud SaaS service instances from within your project.

**Repositories** Statistics Team

**Git**

Filter Git Repositories

All Favorites Favorites First

dockerrepo Repo for Docker Image Build

**Maven**

Project Repository

**NPM**

Project Registry

5. Copy the '**git clone ..**' command from the Basic Setup information box.

MyDevOpsProj1 | Git

dockerrepo.git

No Revisions Exist

Repo for Docker Image Build

**Basic Setup Information for dockerrepo.git**

HTTP

SSH

https://rnsangwan%40gmail.com@tspdevops-theskillpedia.developer.ocp.oraclecloud.com/tspdevops-theskillpedia/

Set up a new repository using the command line

```
git clone https://rnsangwan%40gmail.com@tspdevops-theskillpedia.developer.ocp.oraclecloud.com/tspdevops-theskillpedia/
cd dockerrepo
touch README.md
git add -A .
git commit -m "Initial commit"
git push -u origin master
```

6. Paste this command in the terminal window of your Local linux VM.

```
[root@server ~]# git clone https://rnsangwan%40gmail.com@tspdevops-theskillpedia.developer.ocp.oraclecloud.com/tspdevops-theskillpedia/
Cloning into 'dockerrepo'...
Password for 'https://rnsangwan@gmail.com@tspdevops-theskillpedia.developer.ocp.oraclecloud.com/tspdevops-theskillpedia/':
warning: remote HEAD refers to nonexistent ref, unable to checkout.
[root@server ~]#
```

7. Switch to your DevCS repo directory you cloned and copy the content of the App source directory

```
[root@server ~]# cd dockerrepo/
[root@server dockerrepo]# ll
total 0
[root@server dockerrepo]# cp -r ../DockerFlash/* ./
[root@server dockerrepo]# ll
total 36
-rw-r--r-- 1 root root 1239 Feb 23 10:39 app.js
drwxr-xr-x 2 root root  53 Feb 23 10:39 backend
-rw-r--r-- 1 root root 127 Feb 23 10:39 Dockerfile
drwxr-xr-x 3 root root  23 Feb 23 10:39 fonts
-rw-r--r-- 1 root root 1826 Feb 23 10:39 index.html
```

8. Add the App source files to git staging area and commit the changes to local repository.  
# git add .  
# git commit -m "Initial Commit"

```
[root@server dockerrepo]# git add .
[root@server dockerrepo]# git commit -m "Initial Commit"
[master (root-commit) 105377d] Initial Commit
Committer: root <root@server.example.com>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

13 files changed, 307 insertions(+)
create mode 100644 Dockerfile
```

9. Push the local repo to DevCS repository

# git push -u origin master

```
[root@server dockerrepo]# git push -u origin master
Password for 'https://rnsangwan@gmail.com@tspdevops-theskillpedia.d
Counting objects: 18, done.
Compressing objects: 100% (16/16), done.
Writing objects: 100% (18/18), 27.69 KiB | 0 bytes/s, done.
Total 18 (delta 0), reused 0 (delta 0)
remote: [Push Options] Do you want to create a merge request? Use g
remote: Updating references: 100% (1/1)
```

10. Verify the source files are copied

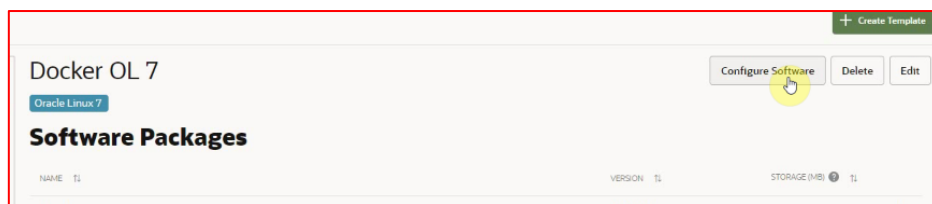
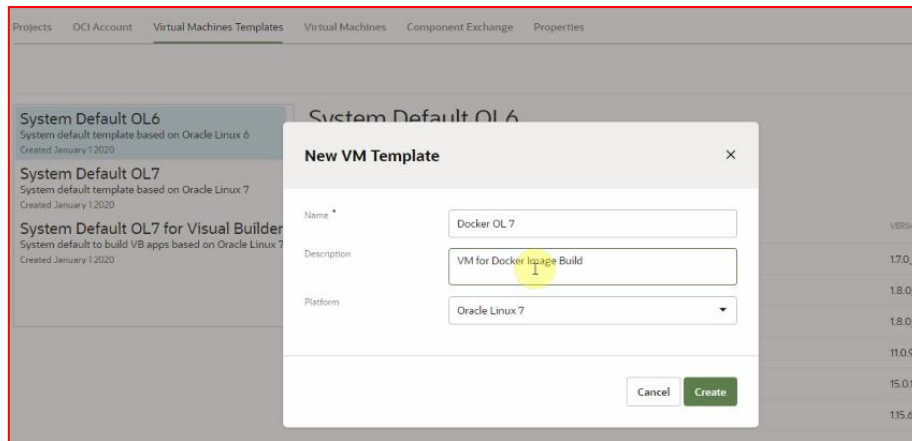
MyDevOpsProj1
Git

dockerrepo.git
master

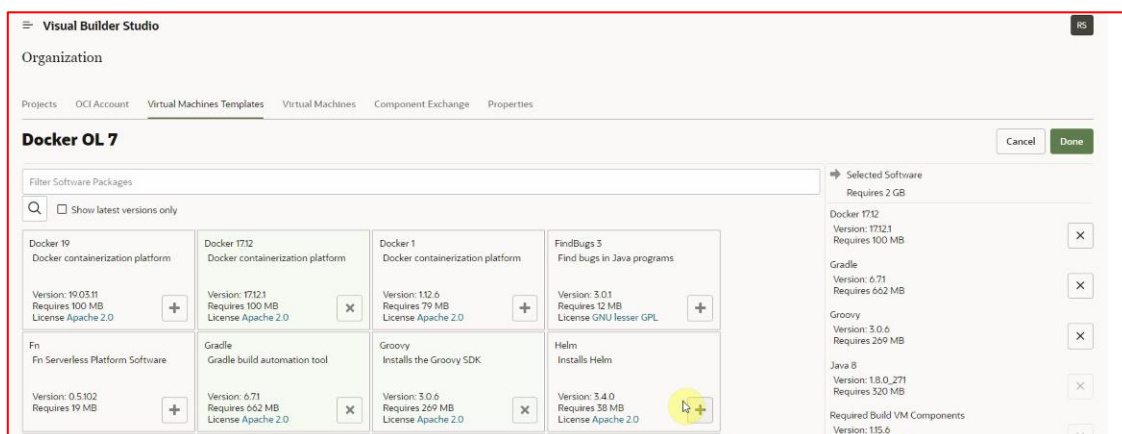
Repo for Docker Image Build

backend	Initial Commit   root
fonts / geomanist	Initial Commit   root
app.js	Initial Commit   root
Dockerfile	Initial Commit   root
index.html	Initial Commit   root

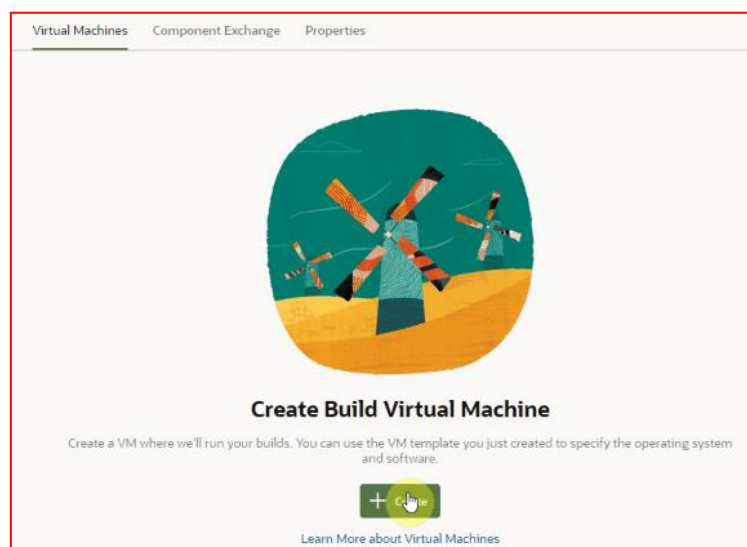
11. Create a Virtual Machine template to be used by your build job



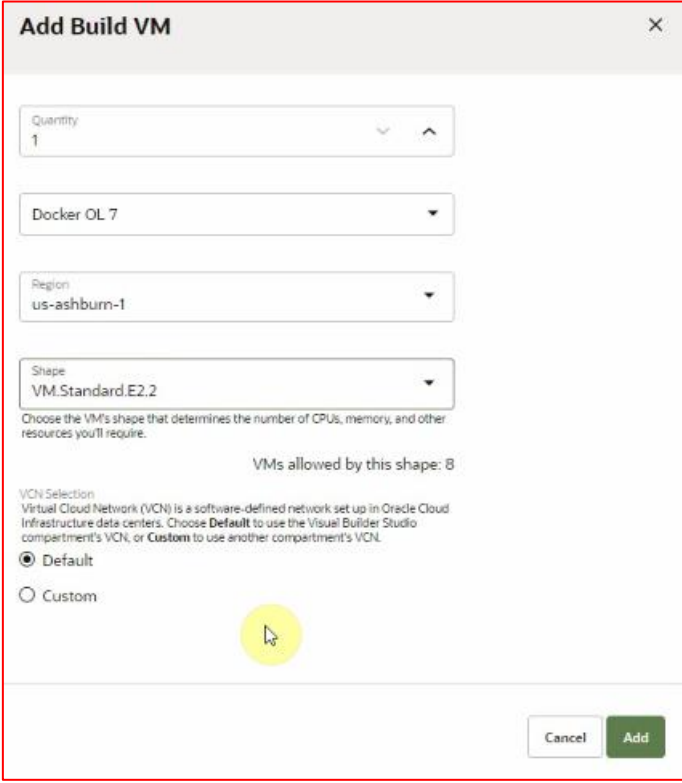
12. Select Docker and other relevant packages for the template.



13. Click on Virtual Machines Tab and Click on Create Build Virtual Machine



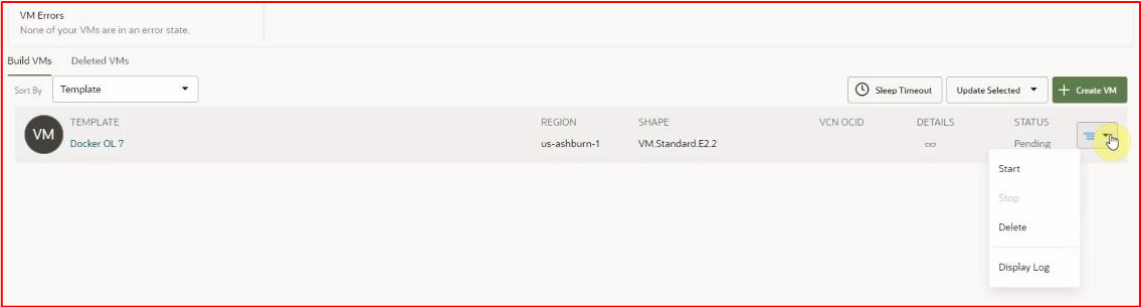
14. Select the Template created above and Shape for the VM



The 'Add Build VM' dialog box contains the following fields and options:

- Quantity:** A numeric input field set to 1.
- Docker OL 7:** A dropdown menu.
- Region:** A dropdown menu set to 'us-ashburn-1'.
- Shape:** A dropdown menu set to 'VM.Standard.E2.2'. Below this, a note states: 'Choose the VM's shape that determines the number of CPUs, memory, and other resources you'll require.' and 'VMs allowed by this shape: 8'.
- VCN Selection:** Radio buttons for 'Default' (selected) and 'Custom'. A note explains: 'Virtual Cloud Network (VCN) is a software-defined network set up in Oracle Cloud Infrastructure data centers. Choose **Default** to use the Visual Builder Studio compartment's VCN, or **Custom** to use another compartment's VCN.'
- Buttons:** 'Cancel' and 'Add' at the bottom right.

15. Once the VM is created, start it. It will take approximately 20 minutes to come up.

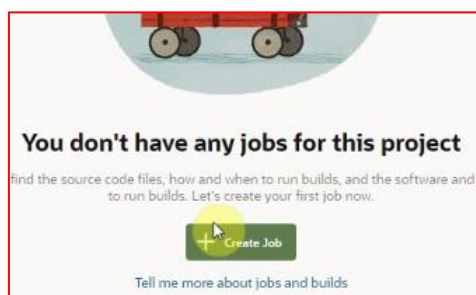


The screenshot shows the 'VM Errors' section with the message 'None of your VMs are in an error state.' Below is a table of VMs:

Build VMs	Deleted VMs	Sort By	Template	Region	Shape	VCN OCID	Details	Status
VM		Template	Docker OL 7	us-ashburn-1	VM.Standard.E2.2			Pending

On the right, a context menu is open over the 'Pending' status, showing options: 'Start', 'Stop', 'Delete', and 'Display Log'.

16. Now click on Build option from the left side bar and select Create Job



17. Specify the Build Job Details. In the Template box select the VM you have created from the template.

New Job

Name \*

DockerImageBuild

Description

A Job to Build Docker Image from Source with Dockerfile

☐ Copy From Existing

☐ Use for Merge Request

Template \*

System Default OL7

Cancel

Create

18. The Job will appear in the list.

Visual Builder Studio

MyDevOpsProj1 | Builds

Jobs Overview > DockerImageBuild > Configure

Jobs (1) Pipelines (0) Build Queue (0) Job Statistics

Create Job

All Jobs Successful Jobs Failed Jobs Test Failed Jobs

Status	Private	Weather	Job	Last Successful	Last Unsuccessful	Duration	Actions
			DockerImageBuild	N/A	N/A	N/A	<div></div> <div></div> <div></div>

19. Now add the git repository to this job under job configuration.

Visual Builder Studio

MyDevOpsProj1 | Builds

Jobs Overview > DockerImageBuild > Configure

Job Configuration

Git Parameters Before Build Steps After Build

Configure Git

Add Git

Git

20. Select the Repo you have created.

Jobs Overview > DockerImageBuild > Configure

## Job Configuration

Git Parameters Before Build Steps After Build

### Configure Git

Git ?

Repository \*  
dockerrepo.git

> Advanced Repository Options

☒ Automatically perform build on SCM commit

**Auto Branch**

☒ Include ☐ Exclude

Branches  
master

Branch name, \* expression, or /regex/, one per line

Exceptions

Branch name, \* expression, or /regex/, one per line

Local Checkout Directory

> Advanced Git Settings

## Job Configuration

Git Parameters Before Build Steps After Build

### Configure Git

Git ?

Repository \*  
dockerrepo.git

> Advanced Repository Options

☒ Automatically perform build on SCM commit

**Auto Branch**

☒ Include ☐ Exclude

Branches  
master

Branch name, \* expression, or /regex/, one per line

Exceptions

Branch name, \* expression, or /regex/, one per line

Local Checkout Directory

> Advanced Git Settings

21. Under advanced git Settings, Select Docker Files as “\*\*/\*”



Local Checkout Directory

▼ **Advanced Git Settings**

**Trigger when**

☒ Include ☐ Exclude

Directories/Files  
\*\*/\*

Regular expressions (regex) or GLOB patterns, one per line

Exceptions

Regular expressions (regex) or GLOB patterns, one per line

22. Add a Job step by select “Steps” tab and then select “Add step” drop down given at the extreme right. Select Docker - > Docker Login step

Cancel Save

Docker login

Docker push

Docker build

Docker tag

Docker push

Docker images

Docker save

Docker load

Docker rmi

Docker version

Docker certificate

Add Step ▼

Common Build Tools ▶

Oracle Deployment

Visual Application ▶

Application Extension ▶

Customization Set Migration ▶

Docker ▶

23. To login using docker, you will need auth token and tenancy namespace along with your user id. For this visit “User settings” page in another tab of your browser and click on Auth Token option given on the left menu.

Resources

Groups

Groups

API Keys

Auth Tokens

Manage Federation

Group membership

24. Give a name to your token and click on Generate

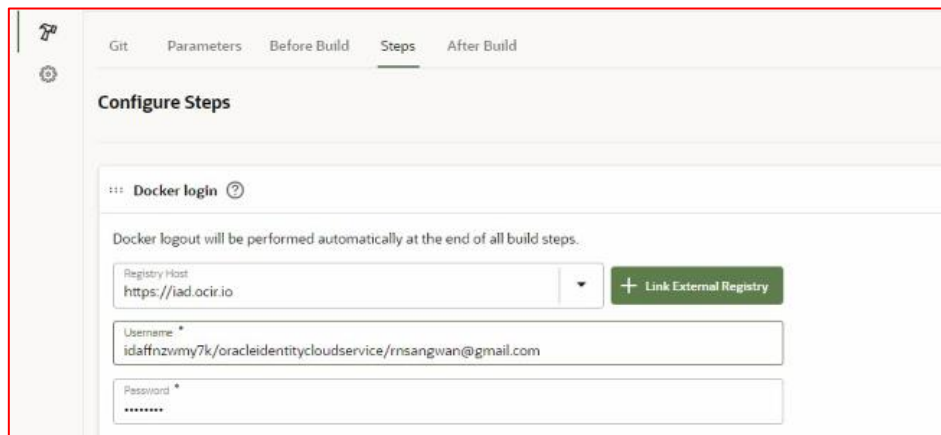
Generate Token

Description

Generate Token Cancel

25. It will display the token. Copy it to a notepad file. You will need it in many steps. Fill in the Registry host, user name and password as given in the screen shot. Use your auth token as password. User Name Format : **<Object Storage Namespace>/<Full Username>**

Password : **<Auth Token>**



Git Parameters Before Build **Steps** After Build

### Configure Steps

... Docker login ?

Docker logout will be performed automatically at the end of all build steps.

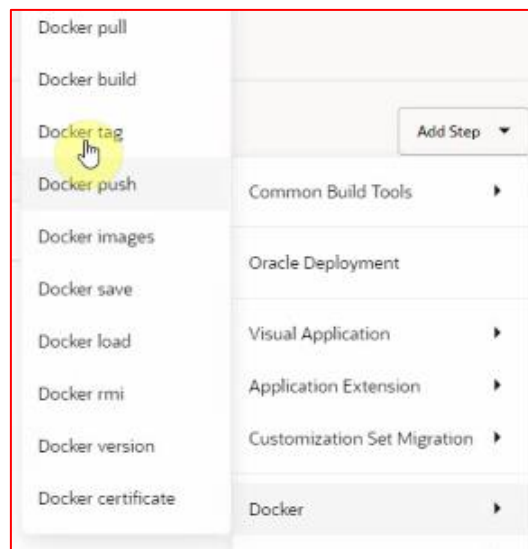
Registry Host  
https://iad.ocir.io

+ Link External Registry

Username \*  
idaaffnzvmy7k/oracleidentitycloudservice/rnsangwan@gmail.com

Password \*  
\*\*\*\*\*

26. Similarly add another step. Add Step -> Docker -> Docker Build



Docker pull

Docker build

**Docker tag**

Docker push

Docker images

Docker save

Docker load

Docker rmi

Docker version

Docker certificate

Add Step

Common Build Tools

Oracle Deployment

Visual Application

Application Extension

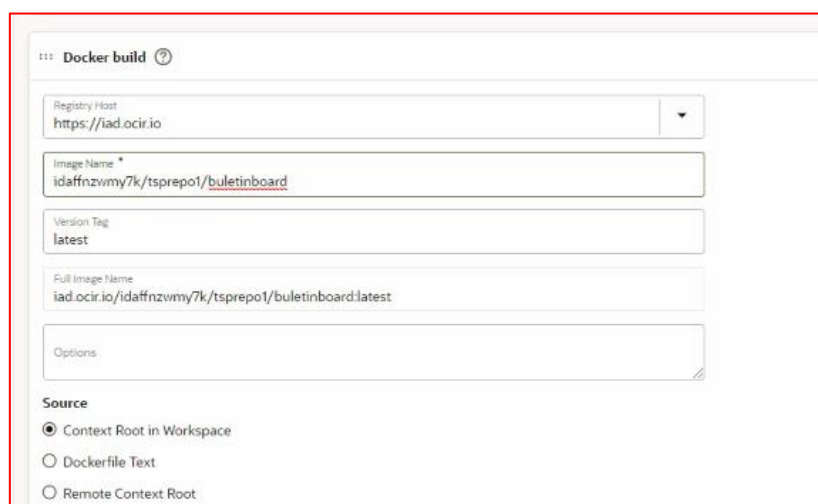
Customization Set Migration

Docker

27. Fill in the Docker Build steps as given in the screen shot.

Registry Host : **https://<Region Code>.ocir.io**

Image Name Format : **<Object Storage NS>/<OCIR Repo>/<Image Name>**



... Docker build ?

Registry Host  
https://iad.ocir.io

Image Name \*  
idaaffnzvmy7k/tsprepo1/buletinboard

Version Tag  
latest

Full Image Name  
iad.ocir.io/idaaffnzvmy7k/tsprepo1/buletinboard:latest

Options

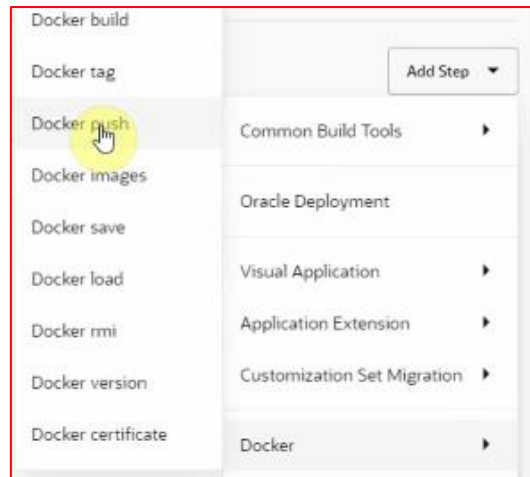
Source

☒ Context Root in Workspace

☐ Dockerfile Text

☐ Remote Context Root

28. Finally add a Docker Push step to push your image to OCIR.



... Docker push ?

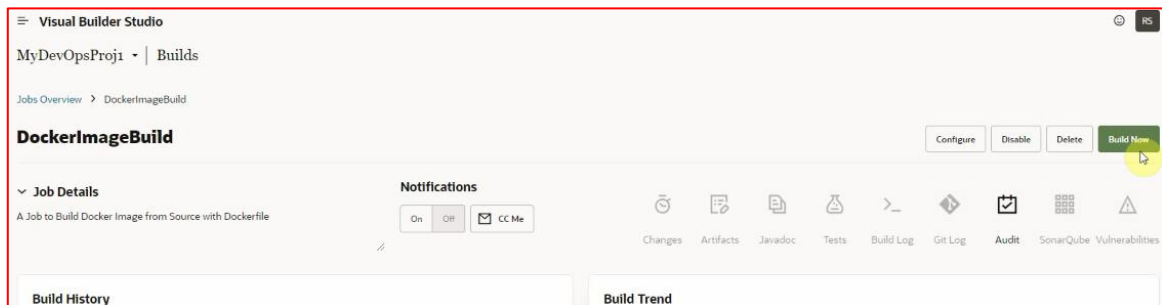
Options

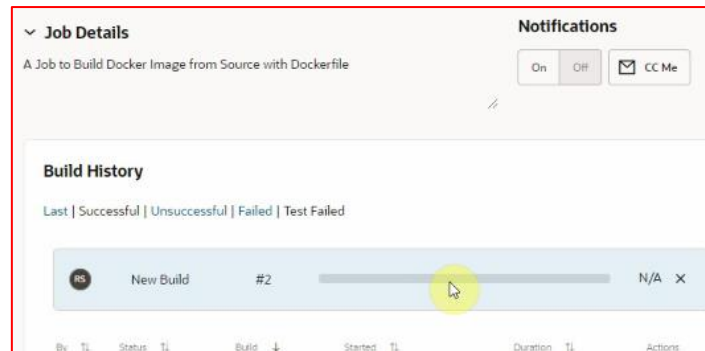
Registry Host  
https://iad.ocir.io

Image Name \*  
idaffnzvmy7k/tspreo1/buletinboard

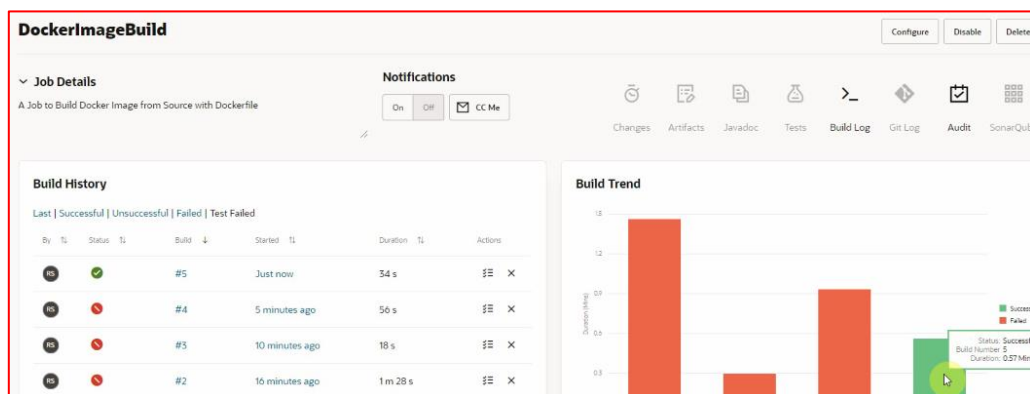
Version Tag  
latest

29. Build your image by clicking on “Build Now” Button as given in following screen shot.

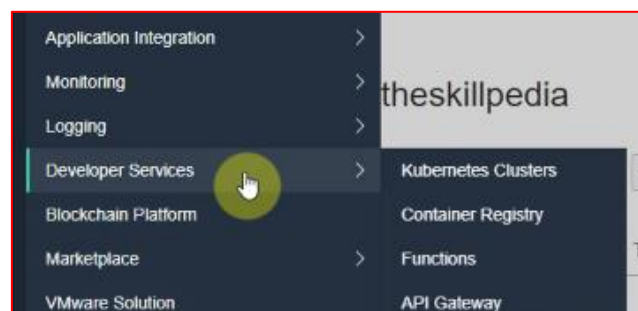




30. Congratulations. Your Build is successful and pushed to OCIR



31. From your OCI web console, visit the OCIR page



32. Verify the images in the OCIR

Registry in theskillpedia (root) Compartment

Create Repository

theskillpedia (root)

- tsprepo1
- tsprepo1/bulelinboard
- latest

**latest**

Full Path: [theskillpedia/7vtsprepo1/bulelinboard/latest](#)

Pushed by: [oracleidentitycloudservice/msangwan@gmail.com](#)

Digest: [...75bc2bf187113fc](#) Show Copy

Repository: [tsprepo1/bulelinboard](#)

Date Created: a minute ago

Size: 62.83 MB

Total Pulls: 0

Last Pull: N/A

Digest	Size	Date
<a href="#">...53607126a16dc0</a> Show Copy	21.48 MB	Tue, 23 Feb 2021 16:45:58 GMT
<a href="#">...5a163f9865abe6</a> Show Copy	4.05 KB	Tue, 23 Feb 2021 16:45:53 GMT
<a href="#">...1a9fd6d412295d7</a> Show Copy	32.78 MB	Tue, 23 Feb 2021 16:46:01 GMT

33. Add Developer and EPEL repository to your existing oracle linux repository

```
# vi /etc/yum.repos.d/oracle-linux-ol7.repo
```

```
[ol7_developer]
```

```
name=Oracle Linux $releasever Development Packages ($basearch)
```

```
baseurl=https://yum.oracle.com/repo/OracleLinux/OL7/developer/$basearch/  
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle  
gpgcheck=1  
enabled=1
```

```
[ol7_developer_EPEL]  
name=Oracle Linux $releasever Development Packages ($basearch)  
baseurl=https://yum.oracle.com/repo/OracleLinux/OL7/developer_EPEL/$basearch/  
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle  
gpgcheck=1  
enabled=1
```

```
[ol7_developer]  
name=Oracle Linux $releasever Development Packages ($basearch)  
baseurl=https://yum.oracle.com/repo/OracleLinux/OL7/developer/$basearch/  
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle  
gpgcheck=1  
enabled=1  
  
[ol7_developer_EPEL]  
name=Oracle Linux $releasever Development Packages ($basearch)  
baseurl=https://yum.oracle.com/repo/OracleLinux/OL7/developer_EPEL/$basearch/  
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-oracle  
gpgcheck=1  
enabled=1
```

#### 34. Install Docker on your local VM

```
# yum install docker -y
```

```
[root@server ~]# yum install docker  
Loaded plugins: langpacks, ulninfo  
Resolving Dependencies  
--> Running transaction check  
--> Package docker-engine.x86_64 0:18.09.1.ol-1.8  
--> Processing Dependency: container-selinux >= 2:  
--> Processing Dependency: containerd for package:  
--> Processing Dependency: runc for package: docke  
--> Processing Dependency: docker-cli for package:  
--> Running transaction check
```

#### 35. Start Docker daemon and enable it to run at restart.

```
# systemctl enable --now docker
```

```
[root@server ~]# systemctl enable --now docker  
Created symlink from /etc/systemd/system/multi-u
```

#### 36. Login to OCIR

Username : <Object Storage NS>/<Full User Name>

Password : <Auth Token>

```
[root@server ~]# docker login iad.ocir.io  
Username: idaffnzwm7k/oracleidentitycloudservice/rnsangwan@gmail.com  
Password:  
WARNING! Your password will be stored unencrypted in /root/.docker/cont  
Configure a credential helper to remove this warning. See  
https://docs.docker.com/engine/reference/commandline/login/#credential  
Login Succeeded
```

#### 37. Pull the Docker Image from OCIR

```
[root@server ~]# docker pull iad.ocir.io/idaaffnzwm7k/tsprepo1/buletinboard:latest
Trying to pull repository iad.ocir.io/idaaffnzwm7k/tsprepo1/buletinboard ...
latest: Pulling from iad.ocir.io/idaaffnzwm7k/tsprepo1/buletinboard
cae7303ade7f: Pull complete
8dd505804d99: Pull complete
512e79453ef6: Pull complete
512787aab62c: Pull complete
084cff3b1e06: Pull complete
1da74df5cade: Pull complete
5b2191a42322: Pull complete
9ebf4d6f86af: Pull complete
32b524fc8137: Pull complete
Digest: sha256:82f23bf60608bdalfafa4340e3bd605f4d1bf30ead2b5545d75bc2bf187113fc
Status: Downloaded newer image for iad.ocir.io/idaaffnzwm7k/tsprepo1/buletinboard:latest
[root@server ~]# docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED
iad.ocir.io/idaaffnzwm7k/tsprepo1/buletinboard	latest	5c3960a36af8	14 hours ago

38. Verify the Docker image and Run it in detached mode.

```
[root@server ~]# docker images
REPOSITORY                                TAG
iad.ocir.io/idaaffnzwm7k/tsprepo1/buletinboard  latest
[root@server ~]# docker run --publish 8000:8080 --detach --name bb i
12be0c6a57817b8c2cd091b54db949607db81b687130fafdc39a77aa76b019b2
[root@server ~]#
```

39. Open the Browser in your host machine and visit <http://10.10.0.100:8000>. Your Bulletin Board Website running in container will open

