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Modern Business in the Cloud

DevOps in the Cloud with Oracle
Developer Cloud Service

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Oracle Cloud Infrastructure DevOps Automation

In this lab, you'll learn how to build a Docker image for a Node.js REST service on Oracle Developer Cloud Service (DevCS), and push it to Docker registries such as Oracle Cloud Infrastructure Registry and DockerHub.

Why Oracle Developer Cloud Service?

In recent years, the world of application development has adopted new methodologies that aim to improve the quality and speed with which applications are being delivered. The introduction of innovative development approaches, such as test-driven development and Agile development, gave rise to a set of new techniques and tools that enable those methodologies. Tools such as automatic build utilities combined with continuous integration platforms, as well as enhanced collaborative tools such as wikis and code review utilities, simplify the adoption of these new methodologies.

However, for many IT shops, setting up these environments and maintaining them was difficult and cost prohibitive, so many organizations stuck to the old way of building applications. Oracle has changed this by introducing a simpler way to adopt modern development methodology and tools with a cloud-based offering known as Oracle Developer Cloud Service.

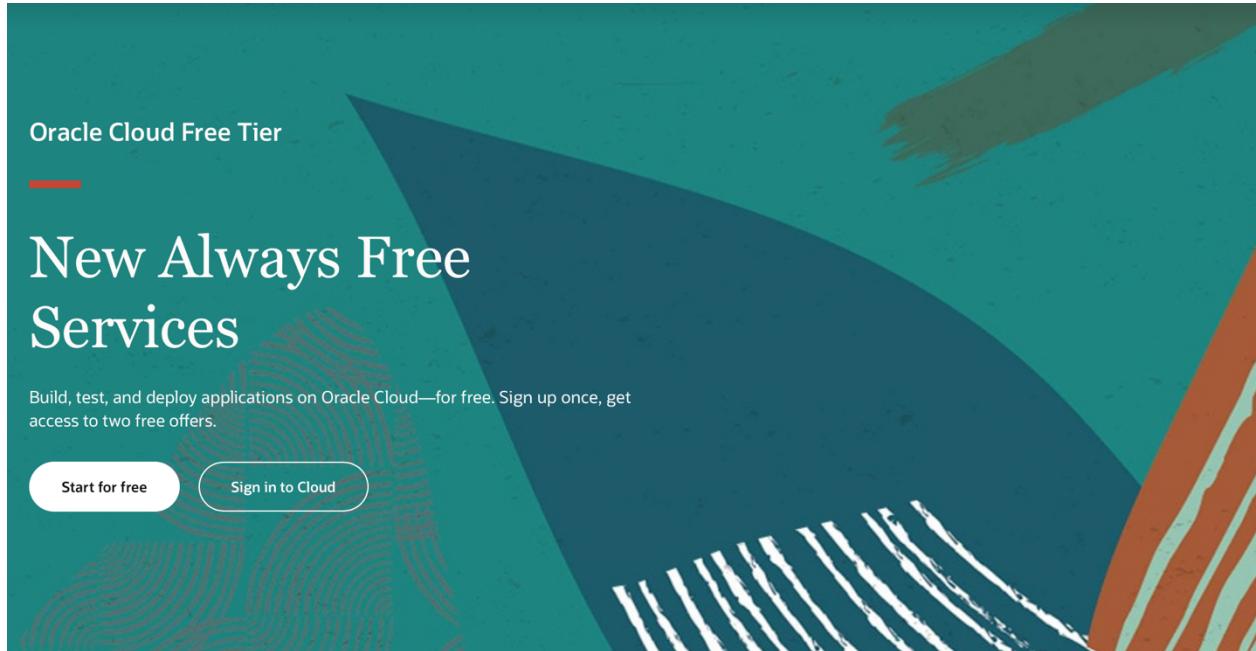
In this tutorial, you will work with DevCS and learn about some of its most important features. Specifically, you will:

- Create a DevCS *project*, which serves as the organizing principle for your software development efforts;
- Pull the code from an existing GitHub repository and use it to populate a DevCS-hosted Git repository;
- Create a task within DevCS and an Agile board to track it;
- Complete the task by branching, making changes to the code using the online editor, then merging the code;
- Build the Docker image with Continuous Integration in DevCS;
- Push the Docker image to Oracle Cloud Infrastructure Registry and DockerHub.

Getting Started

Before we start with the lab, please follow the below instructions to setup you instance:

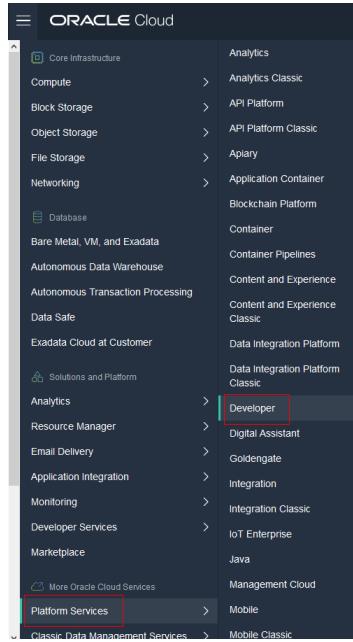
1. Request a free account



- Request a free Oracle Cloud account with credits from <https://www.oracle.com/cloud/free/> and click on the “Start for free” button.
- See the [Overview of the Free Oracle Cloud Promotion](https://www.oracle.com/webfolder/technetwork/tutorials/infographics/oracle_cloud_free_cloud_promotion_overview/index.html) infographic for more information (https://www.oracle.com/webfolder/technetwork/tutorials/infographics/oracle_cloud_free_cloud_promotion_overview/index.html)

2. Create the DevCS service instance

- When you get a *Welcome to Oracle Cloud* email, sign into your Oracle Cloud account using the details provided.
- On the Oracle Cloud page, open the navigation menu (on the left). Under **More Oracle Cloud Services**, select **Platform Services**, and then select **Developer**.



- Click **Create Instance**.
- On the Create New Instance page, enter the required details and click **Next**.
- On the Service Details page, verify the entered details and click **Next**.
- On the Confirmation page, click **Create**.

3. Set up OCI Account Compute and Storage

The OCI Compute services provide the virtual machines (VMs) on which DevCS runs its builds.

The OCI Storage services provide storage for build and Maven artifacts

Set Up the OCI Connection

Before you set up the connections, set up your OCI account to host DevCS resources. They allow DevCS to manage necessary resources, such as VMs for your builds and storage buckets for your project data.

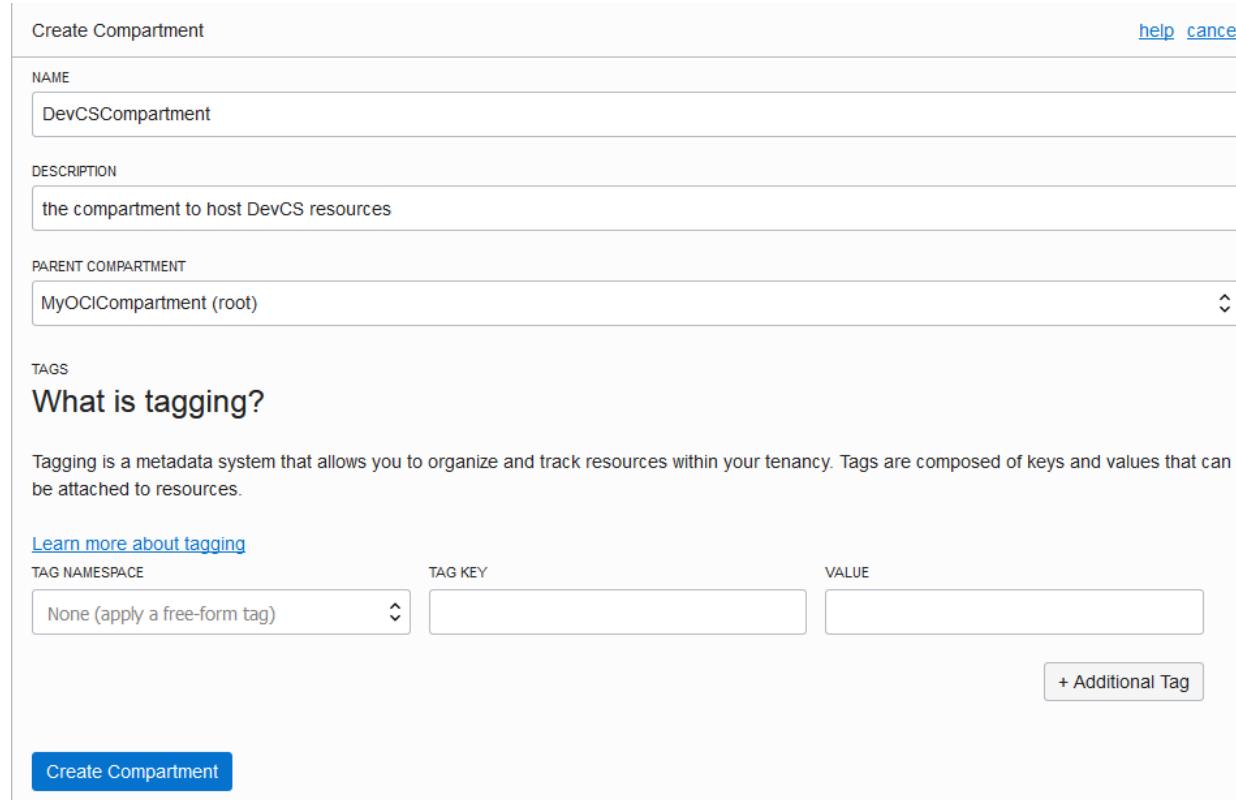
To set up the OCI account, open the OCI console and create a compartment, a group and a user to access the compartment, and a policy that defines access to the compartment. You can use the root compartment and the tenancy user that was created when the OCI account was created, but it's recommended to create a dedicated compartment to host DevCS resources. This allows you to organize DevCS resources better as they aren't mixed with the other resources of your tenancy. You can also restrict users and control read-write access to the compartment without affecting other resources. To learn more about compartments, see [Understanding Compartments](#).

After setting up your OCI account, share the compartment's and the created user's details with the DevCS Organization Administrator to set up the OCI connection in DevCS.

Set Up the OCI Account Compute

1. On the OCI Console, click  in the top-left corner.
2. Under **Governance and Administration**, select **Identity**, and then select **Compartments**.
3. On the Compartments page, create a compartment to host DevCS resources.
 - a. To create the compartment in the tenancy (root compartment), click **Create Compartment**.
 - b. In the Create Compartment dialog box, fill in the fields, and click **Create Compartment**.

Here's an example:



The screenshot shows the 'Create Compartment' dialog box. It has fields for NAME (DevCSCompartment), DESCRIPTION (the compartment to host DevCS resources), PARENT COMPARTMENT (MyOCICompartment (root)), and TAGS. A 'Learn more about tagging' link is available. The 'Create Compartment' button is at the bottom.

NAME
DevCSCompartment

DESCRIPTION
the compartment to host DevCS resources

PARENT COMPARTMENT
MyOCICompartment (root)

TAGS

[Learn more about tagging](#)

TAG NAMESPACE	TAG KEY	VALUE
None (apply a free-form tag)		

+ Additional Tag

Create Compartment

4. Create a user to access the DevCS compartment.
 - a. In the left navigation bar, under **Governance and Administration**, go to **Identity** and click **Users**.
 - b. Click **Create User**.
 - c. In the Create User dialog box, fill in the fields, and click **Create**.

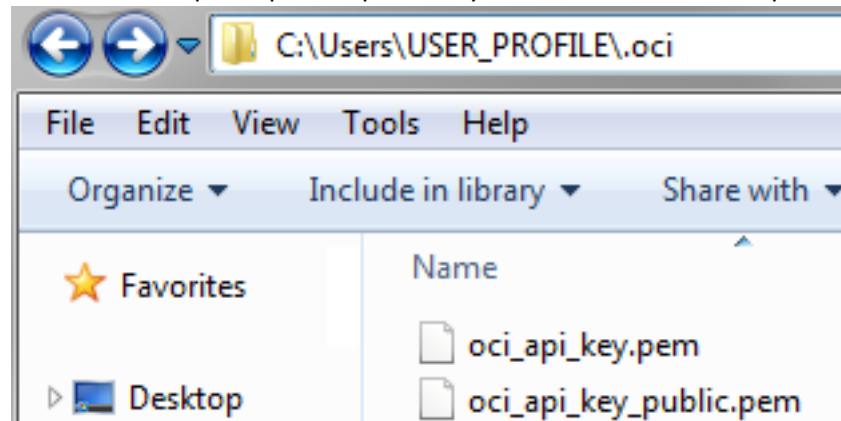
Here's an example:

Create User

[help](#) [cancel](#)

NAME	devcs.user							
No spaces. Only letters, numerals, hyphens, periods, underscores, +, and @.								
DESCRIPTION	User to access the DevCS compartment							
TAGS	<p>Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.</p> <p>Learn more about tagging</p> <table border="1"> <thead> <tr> <th>TAG NAMESPACE</th> <th>TAG KEY</th> <th>VALUE</th> </tr> </thead> <tbody> <tr> <td>None (apply a free-form tag)</td> <td></td> <td></td> </tr> </tbody> </table> <p>+ Additional Tag</p>		TAG NAMESPACE	TAG KEY	VALUE	None (apply a free-form tag)		
TAG NAMESPACE	TAG KEY	VALUE						
None (apply a free-form tag)								
<p>Create</p>								

5. On your computer, generate a private-public key pair in the PEM format.
To find out how to generate a private-public key pair in the PEM format, see [How to Generate an API Signing Key](#) (<https://docs.cloud.oracle.com/iaas/Content/API/Concepts/apisigningkey.htm#How>)
Here's an example of private-public key files on a Windows computer:



6. Upload the public key to the user's details page.
 - a. Open the public key file in a text editor and copy its contents.
 - b. In the left navigation bar of the OCI dashboard, click under **Governance and Administration**, go to **Identity** and click **Users**.
 - c. Click the user's name created in Step 3.
 - d. In the User Details page, click **Add Public Key**.
- Here's an example:

devcs.user

Description: User to access the DevCS compartment

User Information **Tags**

OCID: ...fedr5a [Show](#) [Copy](#) **Status:** Active
Created: Mon, 21 Jan 2019 05:39:53 GMT **Federated:** No

Capabilities

Local password: Yes	SMTP credentials: Yes
API keys: Yes	Customer secret keys: Yes
Auth tokens: Yes	

Resources

- API Keys (0)**
- Auth Tokens (0)
- SMTP Credentials (0)
- Customer Secret Keys (0)
- Groups (0)

API Keys

Add Public Key

There are no API Keys for this User.

Add Public Key

- e. In the Add Public Key dialog box, paste the contents of the public key file, then click **Add**.
 7. On the Groups page, create a group for the user who can access the DevCS compartment and add the user to the group.
 - a. In the left navigation bar, under **Governance and Administration**, go to **Identity** and click **Groups**.
 - b. Click **Create Group**.
 - c. In the Create Group dialog, fill in the fields and click **Submit**.
- Here's an example:

Create Group

[help](#) [cancel](#)

NAME

No spaces. Only letters, numerals, hyphens, periods, and underscores

DESCRIPTION

TAGS

Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.

[Learn more about tagging](#)

TAG NAMESPACE

TAG KEY



VALUE



[+ Additional Tag](#)

[Submit](#)

- d. On the Groups page, click the group's name.
- e. On the Group Details page, click **Add User to Group**.
- f. In the Add User to Group dialog box, select the user created in Step 3, and click **Add**.
Here's an example:

Identity » Groups » Group Details

DevCSGroup

Add User to Group

[help](#) [cancel](#)

USER

Group Information

OCID: ...d6qx4q [Show](#) [Copy](#)

Created: Mon, 21 Jan 2019 05:30:25 GMT

Add

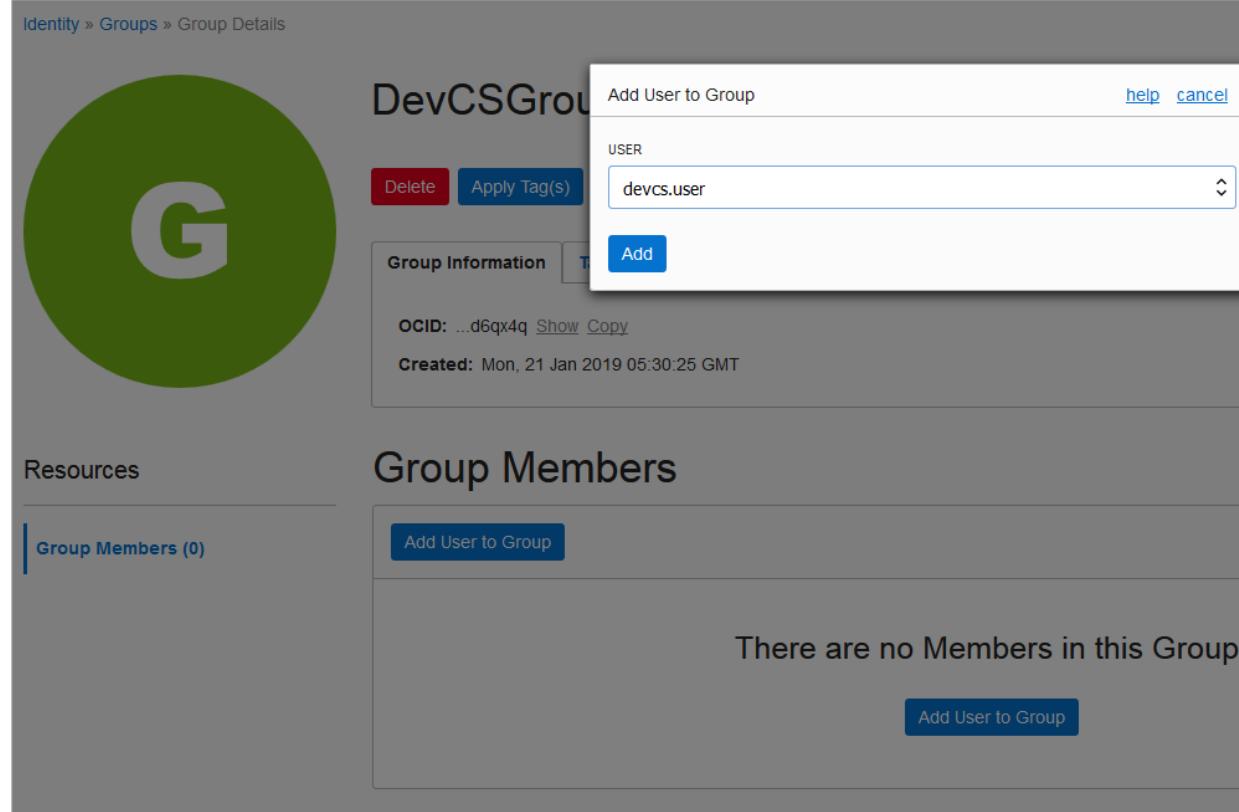
Resources

Group Members

Add User to Group

There are no Members in this Group.

Add User to Group



8. In the root compartment, not the DevCS compartment, create a policy to allow the group created in step 6 to access the DevCScompartment.
 - a. In the left navigation bar, under **Governance and Administration**, go to **Identity** and click **Policies**.
 - b. On the left side of the Policies page, from the **Compartment** list, select the root compartment.
 - c. Click **Create Policy**.
 - d. In **Name** and **Description**, enter a unique name and a description.
 - e. In **Policy Statements**, add these statements.
 - allow group <group-name> to manage all-resources in compartment <compartment-name>

This grants all permissions to the DevCS group users to manage all resources within the DevCS compartment.

- allow group <group-name> to read all-resources in tenancy

This grants read permissions to the DevCS group so that its users can read—but not use, create or modify—all resources inside and outside the DevCS compartment. The group users can't use, create, or modify the resources. This statement is optional.

- f. Here's an example:

The screenshot shows the 'Create Policy' dialog in the OCI Identity service. The 'NAME' field is set to 'DevCSPolicy'. The 'DESCRIPTION' field contains 'Policy for the DevCS group'. Under 'Policy Versioning', the 'KEEP POLICY CURRENT' radio button is selected. The 'Policy Statements' section contains two statements:

- STATEMENT 1: allow group DevCSGroup to manage all-resources in compartment DevCSCompartment
- STATEMENT 2: allow group DevCSGroup to read all-resources in tenancy

Below the statements is a 'TAGS' section with a note: 'Tagging is a metadata system that allows you to organize and track resources within your tenancy. Tags are composed of keys and values that can be attached to resources.' A link 'Learn more about tagging' is provided. At the bottom, there are fields for 'TAG NAMESPACE' (set to 'None (apply a free-form tag)'), 'TAG KEY' (empty), 'VALUE' (empty), and a 'Create' button.

- g. Click **Create**.

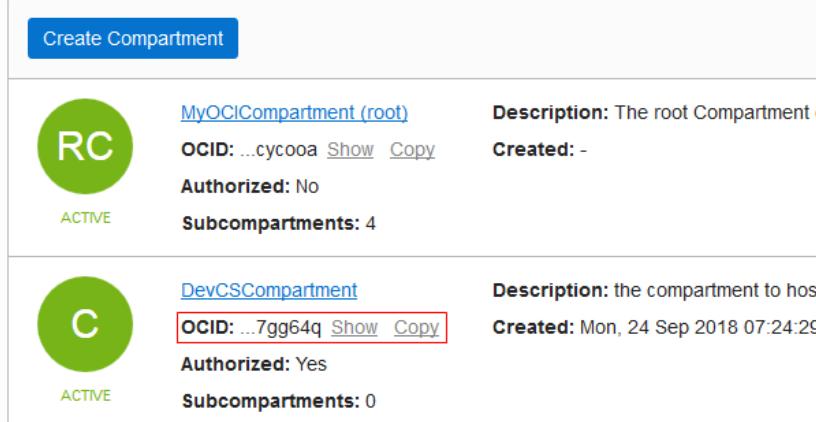
Get the Required OCI Input Values

Every Oracle Cloud Infrastructure resource has an Oracle-assigned unique ID called an Oracle Cloud Identifier (OCID). To connect to OCI, you need the account's tenancy OCID, home region, the compartment's OCID that hosts DevCS resources, and the OCID and fingerprint of the user who can access the DevCS compartment. To connect to OCI Object Storage, you need the Storage namespace. You can get these values from the OCI Console pages.

This table describes how to get the OCI input values required for the connection.

To get these values ...	Do this:
Tenancy OCID, Home Region, and Storage Namespace	<p>On the OCI console, from the left navigation bar, select Administration. The Tenancy Information tab displays the tenancy OCID in OCID, home storage namespace in Object Storage Namespace. Here's an example:</p>  <p>mytenancy</p> <p>Edit Audit Retention Policy Edit Object Storage Settings</p> <p>Tenancy Information Tags</p> <p>Tenancy Information</p> <p>OCID: ...cycooa Show Copy</p> <p>Name: mytenancy</p> <p>Object Storage Settings</p> <p>Amazon S3 Compatibility API Designated Compartment: mytenancy (root)</p> <p>Object Storage Namespace: mytenancy</p> <p>Description of the illustration oci_tenancyinformation.png</p>
User OCID and Fingerprint	<p>On the OCI console, from the left navigation bar, under Governance select Identity > Users. The User Information tab displays the user OCID in OCID. Click the Copy button to copy the OCID to your clipboard. Here's an example of devcs.user:</p>

To get these values ...	Do this:
	<p>Identity » Users » User Details</p>  <p>ACTIVE</p> <p>devcs.us</p> <p>Description: User t</p> <p>Create/Reset Pass</p> <p>User Information</p> <p>OCID: ...vxgpma</p> <p>Created: Mon, 2</p> <p>Description of the illustration oci_userinformation.png</p> <p>To get the fingerprint of the public key associated with your OCI account, go to the API Keys section and copy the fingerprint value.</p> <h2>API Keys</h2> <p>Add Public Key</p>  <p>Fingerprint: 12:34:56:78:90:ab:cd</p> <p>Description of the illustration oci_apikeys.png</p>

To get these values ...	Do this:
Compartment OCID	<p>On the OCI console, from the left navigation bar, select Identity > Compartments. The Compartments list displays the compartments with the compartment's OCID. Click the Copy link to copy it to the clipboard.</p> <p>Here's an example:</p>  <p>The screenshot shows the OCI Compartments page with a 'Create Compartment' button at the top. Below it, there are two compartments listed:</p> <ul style="list-style-type: none"> MyOCICompartment (root): Description: The root Compartment. OCID: ...cycooa. Created: -. Authorized: No. Subcompartments: 4. DevCSCompartment: Description: the compartment to host DevCS. OCID: ...7gg64q. Created: Mon, 24 Sep 2018 07:24:29. Authorized: Yes. Subcompartments: 0. <p>Description of the illustration oci_compartments.png</p>

Set Up the OCI Connection in DevCS

To connect to OCI, get the DevCS compartment's details, user details, and the required OCID values. Then, create an OCI connection from DevCS. If you're not the OCI administrator, get the details from the OCI administrator.

1. Go back to the browser window where you created the DevCS instance and open the service console by clicking the Actionmenu , and then selecting Access Service Instance.
2. In the navigation bar, click **Organization** .
3. Click the **OCI Account** tab.
4. Click **Connect**.

Organization

Projects OCI Account Build Virtual Machines Properties



Connect OCI Account

Your OCI account automatically contains Compute and Storage instances. Before you can use DevCS, however, you need to connect to those accounts. Let's do that now.

[Connect](#)

1. In **Account Type**, select **OCI**.
2. In **Tenancy OCID**, enter the tenancy's OCID copied from the Tenancy Details page.
3. In **User OCID**, enter the OCID of the user who can access the DevCS compartment.
4. In **Home Region**, select the home region of the OCI account.
5. In **Private Key**, enter the private key of the user who can access the DevCS compartment.
The private key file was generated and saved on your computer when you created the private-public key pair in the PEM format. See Step 4 in [Set Up the OCI Account](#).
6. In **Passphrase**, enter the passphrase used to encrypt the private key. If no passphrase was used, leave the field empty.
7. In **Fingerprint**, enter the fingerprint value of the private-public key pair.
8. In **Compartment OCID**, enter the compartment's OCID copied from the Compartments page.
9. In **Storage Namespace**, enter the storage namespace copied from the Tenancy Details page.
10. To agree to terms and conditions, select the terms and conditions check box.
11. To validate the connection details, click **Validate**.
12. After validating the connection details, click **Save**.

Here's an example of an **OCI Account** tab filed with required OCI details.

Configure OCI Account

Account Type

OCI OCI Classic

OCI Credentials

Enter your OCI credentials below. We will use this account for storing artifacts and running builds.

* Tenancy OCID	ocid1.tenancy.oc1..
* User OCID	ocid1.user.oc1..
* Home Region	US_ASHBURN_1
* Private Key	-----BEGIN RSA PRIVATE KEY----- [REDACTED]
Passphrase	[REDACTED]
* Fingerprint	[REDACTED]
* Compartment OCID	ocid1.compartment.oc1..
* Storage Namespace	devcstest
<input checked="" type="checkbox"/> * Developer Cloud Service requires these credentials to access Compute_Operations role privileges, which are extensive. By checking the box, you acknowledge that you have read and accepted the terms specified here .	

Validate



Compute Connection Successful



Storage Connection Successful

Cancel

Save

Set Up the OCI Account Storage

- On the OCI Console, click  in the top-left corner. Under **Core Infrastructure**, click **Object Storage**.
- Select the compartment you created earlier from the **Compartment** list on the left side of the page.
- Click **Create Bucket**.
- In the **Create Bucket** dialog box, specify the attributes of the bucket:
 - i. **Bucket Name:** The system generates a default bucket name that reflects the current year, month, day, and time, for example **bucket-20190306-1359**.
(Note: If you change this default to any other bucket name, use letters, numbers, dashes, underscores, and periods. Do not include any confidential information.)
 - ii. **Storage Tier: Select the Standard option.**
Note: Available tiers include:

Standard is the primary, default Object Storage tier for storing frequently accessed data that requires fast and immediate access. **Archive** is a special tier for storing infrequently accessed data that requires long retention periods. Access to data in the **Archive** tier is not immediate. You must restore archived data before it's accessible. For more information, see [Overview of Archive Storage](#).)

iii. **Object Events: Select the default option.**

Note: Select **Emit Object Events** if you want to enable the bucket to emit events for object state changes. For more information about events, see [Overview of Events](#).)

iv. **Encryption:** Buckets are encrypted with keys managed by Oracle by default, but you can optionally encrypt the data in this bucket using your own Key Management encryption key. **Select the ENCRYPT USING ORACLE MANAGED KEYS option.**

v. **Tags:** Optionally, you can apply tags. If you have permissions to create a resource, you also have permissions to apply free-form tags to that resource. To apply a defined tag, you must have permissions to use the tag namespace. For more information about tagging, see [Resource Tags](#). If you are not sure if you should apply tags, skip this option (you can apply tags later) or ask your administrator.

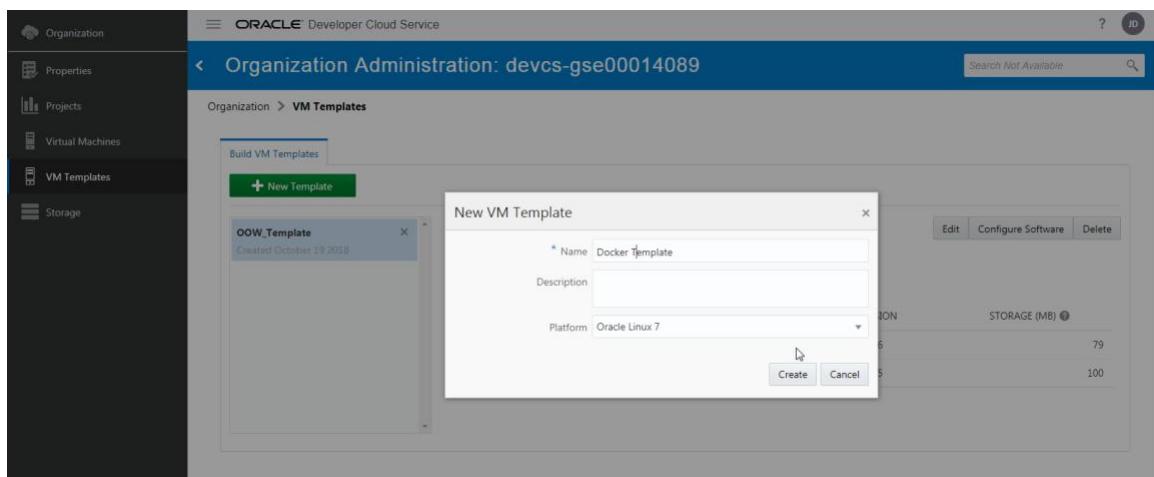
- Click **Create Bucket**.

Note: The bucket is created immediately and you can add objects to it. Objects added to archive buckets are immediately archived and must be restored before they are available for download.

4. Create Build VM Template

For the builds to work in this lab, we will also have to configure Build Template and Build VM as per the below instructions:

- Go Back to the DevCS browser window. In the Organization menu where you have configured the Storage and Compute Cloud Service Configurations. Click on the **VM Templates tab** and then on the "Create" button. In the dialog box that pops up, give a template name such as **DockerTemplate**. Select Platform as Oracle Linux 7 and click on the Create button.



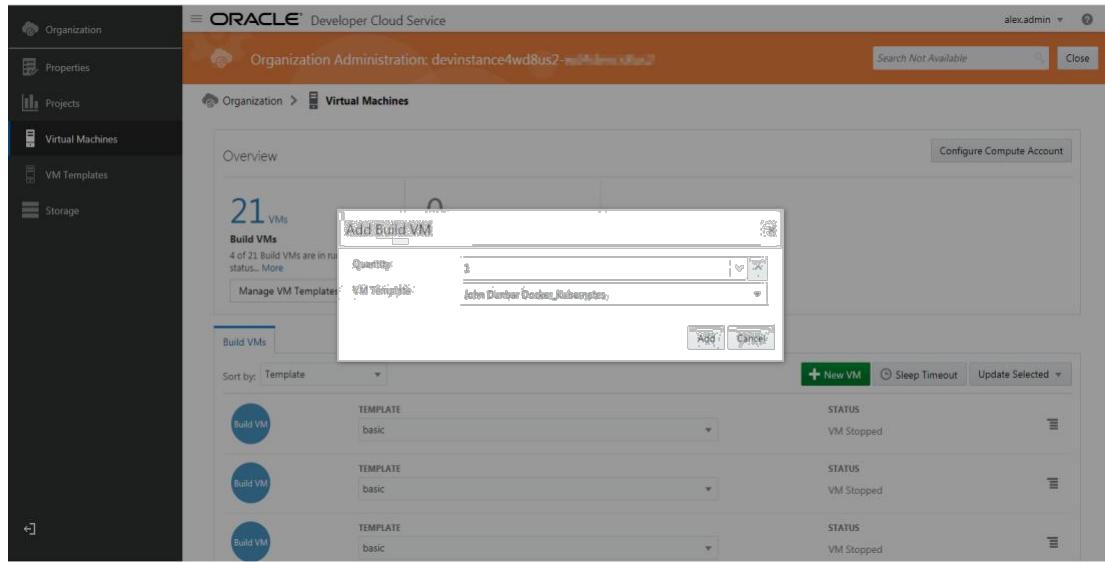
- Now on creation of the template click on “Configure Software” button.

NAME	VERSION	STORAGE (MB)
Required Build VM Components	1.6.15	100

- Select Docker from the list of software bundles available for configuration and click on the + sign for each software bundle that you intend to add to the template. Then click on “Done” button to complete the Software configuration.

NAME	VERSION	SIZE
Docker 1	1.12.6	Requires 79 MB
Gradle 3	3.5.1	Requires 82 MB
Node.js 8	8.4.0	Requires 65 MB
Node.js 0.12		
FindBugs 3	3.0.1	Requires 12 MB
Gradle 2	2.14.1	Requires 50 MB
Kubectl	1.8.4	Requires 50 MB
Node.js 4	4.8.0	Requires 45 MB
Node.js driver for Oracle Databases...		
OCICli		

- Click on the **Build Virtual Machines** tab, then click on “Create” button and in the dialog box that pops up, enter the Quantity as 1 and select Docker Template for the VM Template dropdown. Then click the Add button.

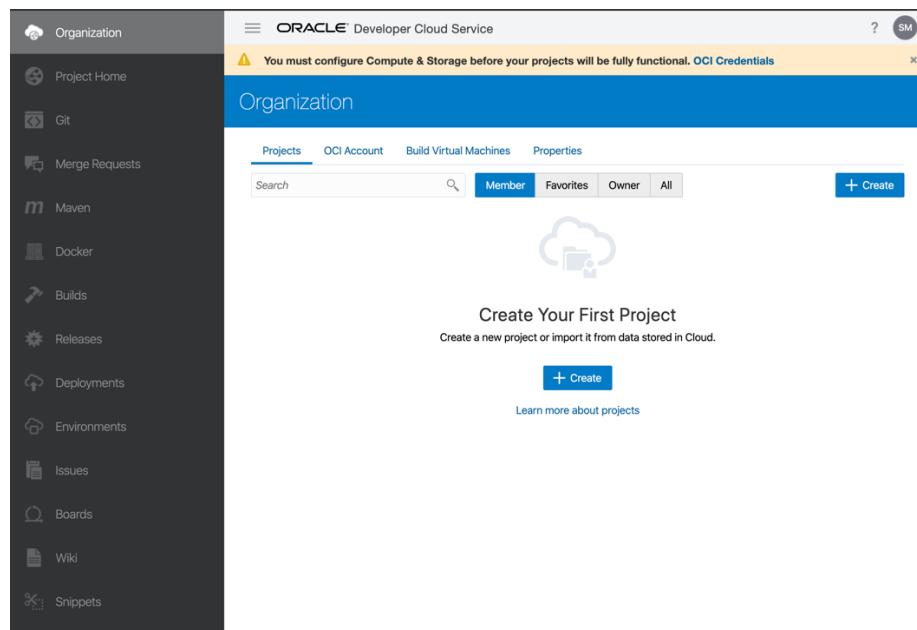


Now let's get started, with the lab!

Milestone 1: Create a project environment for your team

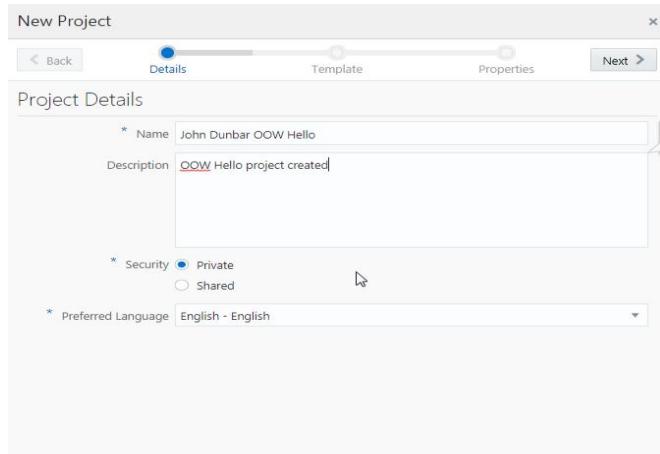
In this section, you'll provision a complete development platform for your team by leveraging DevCS's web interface.

1. Click on the Projects Tab of the Organization page in DevCS.
2. On the Welcome page, click **Create**

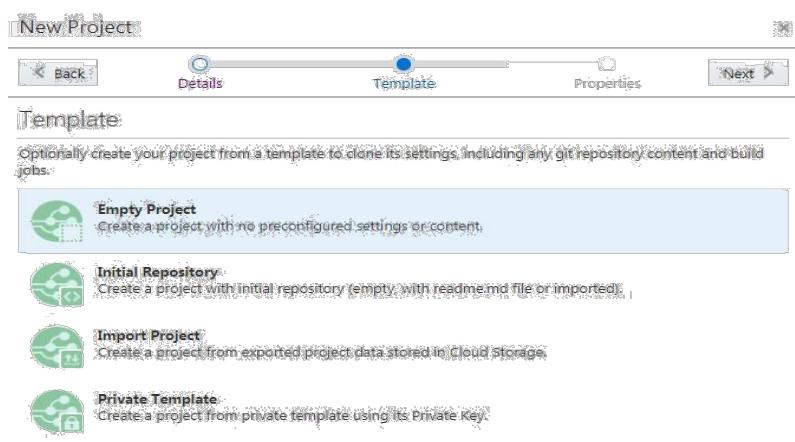


3. Give your project a name that begins with your own name, such as John Dunbar OOW Hello, to make your project unique. Then:

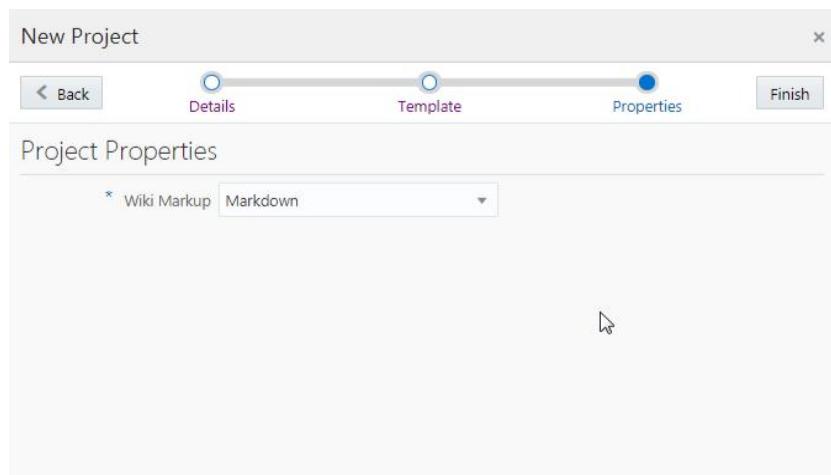
- Enter a **Description**, such as OOW Hello project.
- Leave the Security setting specified as **Private**.
- Click **Next**.



4. Click **Empty Project**, then click **Next**



5. Select your preferred wiki markup language, then click **Finish**.



- Wait while the project modules are provisioned, which can take a minute or two. You can see the indicators turn green as the associated modules are provisioned.



- When everything is provisioned, the project Home page opens, which contains details about your newly created project:

John Dunbar OOW Hello | Summary

ENVIRONMENTS

Create Your First Environment

RECENT ACTIVITIES - TODAY

- Alex Admin deleted hosted repository Test1.git Just now
- Alex Admin deleted hosted repository NodeJS Docker.git Just now
- Alex Admin deleted hosted repository Kubernetes.git Just now
- Alex Admin created hosted repository Test2.git Just now
- Alex Admin created new branch feature in NodeJS Docker.git with commit 30e5174e Update Main.js Today at 12:08 AM +0530

YESTERDAY

- Alex Admin created Task 1: Change the message in Main.js Yesterday at 11:04 PM +0530

REPOSITORIES

New Developer Cloud Service Discussion Forum

The Oracle Developer Cloud Service forum is now part of the Cloud Customer Connect Platform

REPOSITORIES

Filter Git Repositories

All Favorites

No git repositories to display
No git repositories exist in this project.

Maven

HTTP <https://devinstance4id8u2-wd4devcs8u2.uscom-central.oci.oraclecloud.com>

Docker

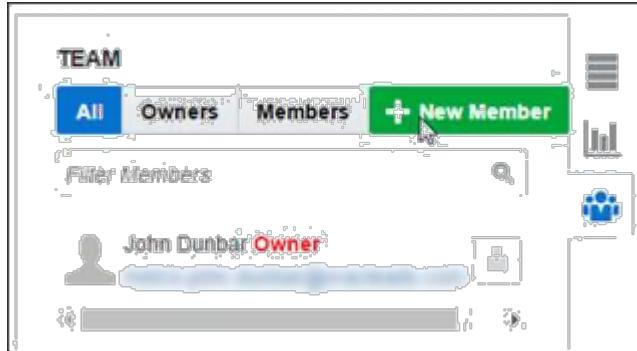
No external docker registries linked to this project.

Let's take a look at this page (you may need to scroll to see the whole thing):

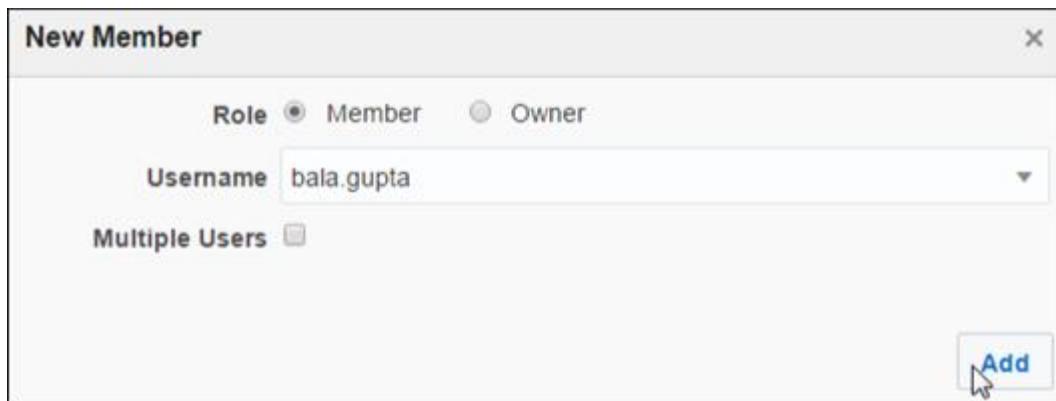
- On the left side is an activity feed.
- Tabs on the right side show you where the Git source code and Maven repositories are located.
- Also on the right you can see project statistics, as well as the UI where you can manage team members. Let's take a look at that UI now.

***** need to configure access for other user to DevCS if you want to run the following 3 steps

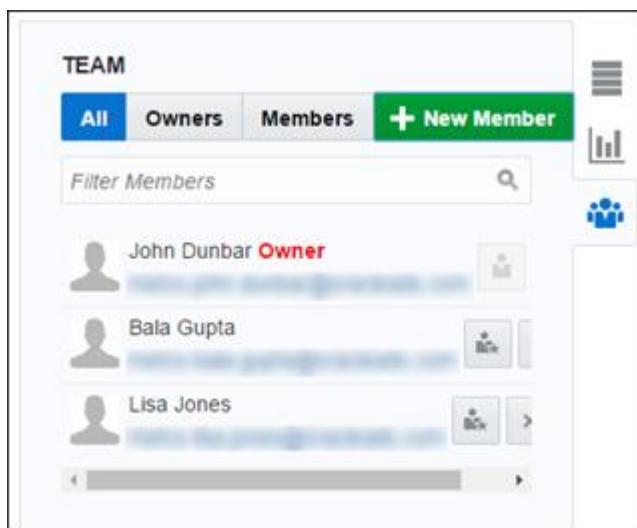
8. Scroll to the right and click the **Team tab**, then click **+Add Member**.



9. Select another team member from the drop-down list and click **Add**.



10. Repeat steps 8 and 9 again so that your project team contains two other members besides yourself.



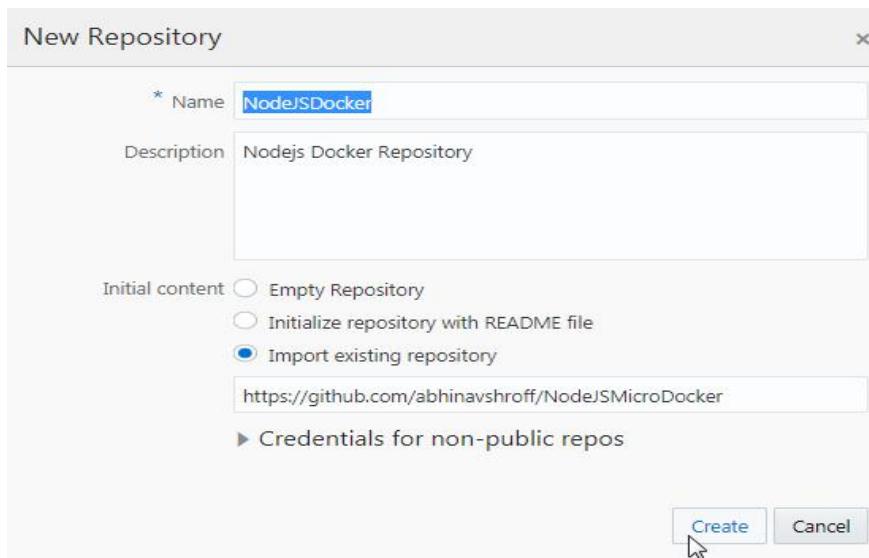
Each team member can now log in to the environment and start collaborating on project development.

End of optional skip *****

Milestone 2: Fetch and review code from the Git repository

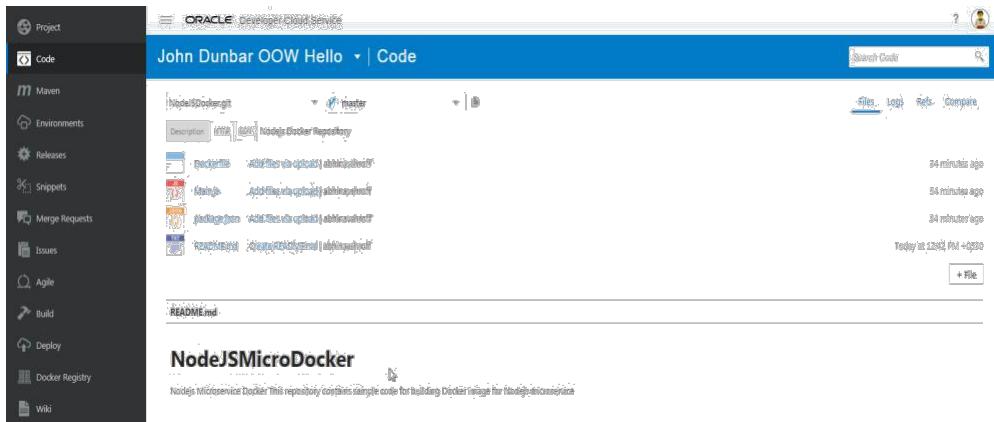
1. On the right side of the home page, click **Repositories Tab** and then the **Create** button

2. In the New Repository dialog, enter these details:
 - a. NodeJSDocker in the **Name** field
 - b. Nodejs Docker Repository in the **Description** field
 - c. Import Existing Repository under **Initial content**
 - d. <https://github.com/StephaneMoriceau/NodeJSMicroDocker> in the text box:

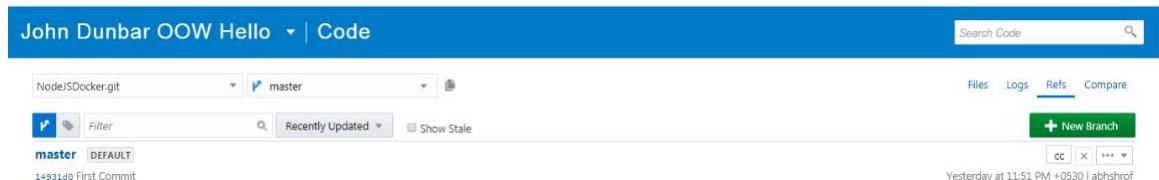


3. Click **Create**.

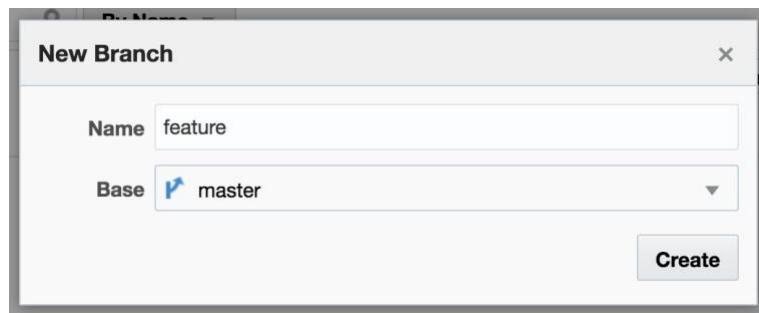
4. You should now be on the Code tab, which shows that you have a new DevCS git repository, NodeJSDocker.git. This new repository contains imported code from the GitHub repository you specified.



- Click the **Refs** tab to view the current list of branches. At this point there's only one, the master branch:

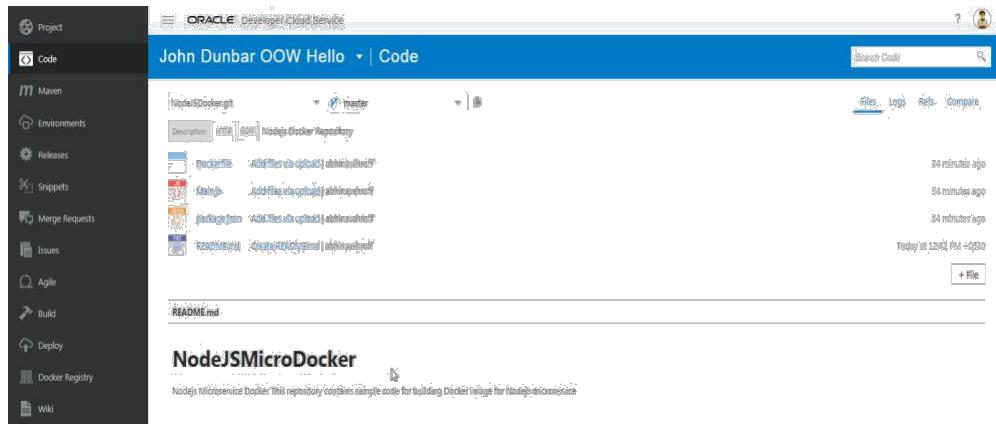


- Click **New Branch**, and create a new branch called `feature`, based on the master branch.



- Click **Files** in the upper right.

When you create a new branch, four files are automatically created: Main.js, Dockerfile, package.json, and Readme.md, which describes the repository.



7. Take a look at what's in each file by clicking each file name successively. In particular, notice that:

- Main.js contains the Node.js REST API code
- Dockerfile contains the commands to build a Docker image
- package.json defines the dependencies for the Node.js code

8. Let's go back to Main.js, and on the right notice that there are five methods for viewing a file on the Code tab:

- File
- Blame
- Logs
- Refs
- Compare

9. Click **Blame** tab to view the code and the file's commit history:

```

NodeJSMicroDocker.git master
Main.js

alex.admin Friday at 8:54 PM +0530 Update Main.js
14931d8 » abhshrof 2018-9-26
First Commit
1 var express = require("express");
2 var bodyParser = require("body-parser");
3 var app = express();
4 app.use(bodyParser.urlencoded());
5 app.use(bodyParser.json());
6 var router = express.Router();
7
8 router.get('/message',function(req,res){
9   res.json({"error": false, "message": "Hello OOW!"}); // Change OOW to your name here...
10 });
11
12 router.post('/add',function(req,res){
13   res.json({"error": false, "message": "success", "data": req.body.num1 + req.body.num2});
14 });
15
16 app.use('/',router);
17
18 app.listen(80,function(){
19   console.log("Listening at PORT 80");
20 });

```

10. Next, click **Logs**, where you can see the list of the commits for this branch, as well as the code that was pushed with each commit:

File Blame Logs Refs Compare

/ Main.js

master X

ON FRIDAY

HEAD (master) Update Main.js
alex.admin Friday at 8:54 PM +0530

+2-2 Main.js

SEPTEMBER 26 2018

A First Commit
abnshrof September 26, 2018 11:51 PM +0530

30e5174 Code

Hide Details ▾

14931d0 Code

Show Details ▾

11. Click **Files**, then click **Dockerfile**. We'll use this file a bit later, when we build the Docker image.

Code

Maven Environments Releases Snippets Merge Requests Issues Agile

John Dunbar OOW Hello | Code

NodeSDocker.git master

/ Dockerfile

ab...

```
1 FROM node:6
2
3 ADD Main.js /
4 ADD package.json /
5
6 RUN npm install
7
8 EXPOSE 80
9
10 CMD [ "npm", "start" ]
```

File Blame Logs Refs Compare

12. Click the forward slash next to the Dockerfile name, then click **package.json** to review the Node.js code dependencies.

Code

Maven Environments Releases Snippets Merge Requests Issues Agile

John Dunbar OOW Hello | Code

NodeSDocker.git master

/ package.json

ab...

```
1 {
2   "name": "NodejsMicro",
3   "version": "0.0.1",
4   "scripts": {
5     "start": "node Main.js"
6   },
7   "dependencies": {
8     "body-parser": "^1.13.2",
9     "express": "^4.13.1"
10 }
11 }
```

File Blame Logs Refs Compare

Milestone 3: Track issues for your project

In this section, we'll start tracking tasks (issues) that our team needs to take care of. We'll then organize these tasks into a sprint.

1. In the left nav bar click **Issues**, then click **New Issue**:

The screenshot shows the 'Track Issues' interface. On the left, there are sections for 'Advanced Searches', 'Standard Searches', and 'My Searches'. Under 'Standard Searches', there are links for 'All Issues', 'Assigned to me', 'Open issues', 'Recently changed', and 'Related to me'. The main area displays a table titled 'Recently changed' with columns: ID, Summary, Component, Status, Owner, Created, and Changed. A message 'No data to display.' is shown above the table. At the bottom, there is a navigation bar with 'Page 1 (0 of 0 items)' and a search input field.

2. For your first issue:

- Type Change the message in Main.js in the **Summary** field
- Type Change OOW in message to my name in Main.js in the **Description** field
- Select **Task** in the **Type** drop-down list.

The screenshot shows the 'New Issue' creation form. On the left sidebar, there are links for 'Maven', 'Environments', 'Releases', 'Snippets', 'Merge Requests', 'Issues' (which is selected), 'Agile', and 'Build'. The main form has a title 'Issues > New Issue'. It contains fields for 'Summary' (containing 'Change the message in Main.js') and 'Description' (containing 'Change OOW in message to my name in Main.js'). At the top right, there are 'Create Issue' and 'Cancel' buttons.

- Scroll down, and from the **Status** drop-down list, select **Assigned**.
- From the **Owner** drop-down list, select **kevinevans** (your user).
- In the **Story Points** field, enter 3.

The screenshot shows the 'New Issue' creation form with more detailed fields filled in. The 'Details' section includes fields for Type (Task), Severity (Normal), Priority (Normal), Product (Default), Component (Default), Found In (empty), Status (Assigned), Release (empty), Owner (Alex Admin), and CC (empty). The 'Time' section includes fields for Due Date (mm/dd/yy) and Estimated days. The 'Agile' section includes a Story Points field set to 3. The entire form is scrollable.

- Click **Create Issue**.
- Click the **Issues** tab to see the new issue:

The screenshot shows the 'All issues' search results. There is one item listed:

Type	ID	Summary	Component	Status	Owner	Created	Changed
Change	1	Change the message in Mail	Default	Assigned	Alex Admin	10/3/2018	10/3/2018

Search filters and buttons at the top include: Advanced Searches, Standard Searches (with 'All issues' selected), My Searches, Shared Searches, Global Searches, Clear Selection, Select All, Update Selected, and New Issue.

Task 4: Create an Agile board and a sprint to track issues

In this section, we explore the DevCS features that help you manage your agile development process.

1. In the left nav bar, click **Board**, then click **New Board / Create**.

The screenshot shows the 'Find Board' page. The 'All Board Types' tab is selected. Other tabs include 'Owned' (selected), 'Favorites', and 'Scrum'. A 'New Board' button is visible. A search bar at the bottom is labeled 'Filter Boards'.

2. In the New Board dialog box:
 - a. Type Hello Board in the **Name** field
 - b. Select **Story Points** from the **Estimation** drop-down list
 - c. Click **Create**.

The screenshot shows the 'New Board' dialog box. The 'Scrum' tab is selected under 'Type'. The form fields are:

- * Name: Hello Board
- * Search: All issues
- * Estimation: Story Points

At the bottom are 'Create' and 'Cancel' buttons.

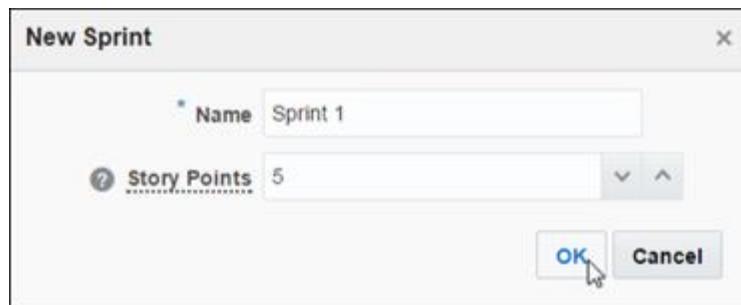
You can see the issue you created earlier in Backlog. Let's add it to a sprint.

3. Click **New Sprint / Add Sprint**.



The screenshot shows the Jira Backlog interface. At the top, there are navigation tabs: 'Backlog', 'Active Sprints', 'Reports', and 'Board'. Below the tabs, a 'Hello Board' dropdown is open. A green 'New Sprint' button is prominently displayed. The main area shows a backlog with one item: 'Task 1' with the description 'Change the message in Main.js'. There are icons for priority, status, and task type. A user 'Alex Admin' is listed on the right. A 'New Issue' button is at the bottom left.

4. Let's call our new sprint **Sprint 1**. In the **Story Points** field enter 5, then click **OK**.



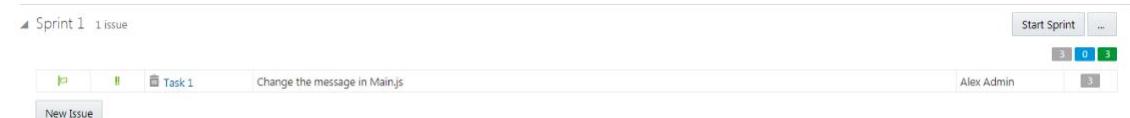
You can now see the new sprint, along with instructions on how to add issues to it.

5. Drag and drop Task 1 to Sprint 1, taking care to drop it right on top of the instructions.



The screenshot shows the Jira Backlog interface after creating Sprint 1. The top navigation bar includes 'Backlog', 'Active Sprints', 'Reports', and 'Board'. A 'Start Sprint' button is visible. The main area shows a sprint summary for 'Sprint 1' with '0 issues'. Below it, the backlog shows 'Task 1' with the instruction 'Change the message in Main.js'. A 'New Issue' button is at the bottom left.

6. Click **Start Sprint** to make the sprint active.



The screenshot shows the Jira Backlog interface after starting Sprint 1. The top navigation bar includes 'Backlog', 'Active Sprints', 'Reports', and 'Board'. A 'Start Sprint' button is visible. The main area shows a sprint summary for 'Sprint 1' with '1 issue'. Below it, the backlog shows 'Task 1' with the instruction 'Change the message in Main.js'. A 'New Issue' button is at the bottom left.

7. In the Start Sprint dialog box, accept the default start and end dates and click **Start**.

By default, a sprint lasts two weeks. You can now see the default dates above the issue list for Sprint 1.

The screenshot shows a 'Start Sprint' dialog box. It has fields for 'Name' (Sprint 1), 'Start Date' (10/03/18 23:15), 'End Date' (10/17/18 23:15), and 'Story Points' (5). There are also 'Start' and 'Cancel' buttons.

- Click **Active Sprints** to view the progress of the sprint. You can see at a glance all the tasks considered To Do, In Progress, or Completed.

The screenshot shows the DevCS interface with the 'Hello Board' selected. The 'Active Sprints' tab is active. The board has three columns: 'To Do (0)', 'In Progress (1)', and 'Completed (0)'. A single task titled 'Task 1: Change the message in Main.js' is in the 'In Progress' column, assigned to 'alex.admin'.

Milestone 5: Edit your code and commit it to the working branch

In this section, we'll see how DevCS helps you edit your code and commit it to the working branch.

- Click **Git** in the left nav, then select the NodejsDocker.git repository and the feature branch, as shown here:

The screenshot shows a Git commit history for a repository named 'NodeJSMicroDocker'. The commits are as follows:

- Today at 1:54 PM +0530: Add Dockerfile and Dockerfile
- Today at 1:54 PM +0530: Add Dockerfile and Dockerfile
- Today at 1:54 PM +0530: Add Dockerfile and Dockerfile
- Today at 1:54 PM +0530: Add Dockerfile and Dockerfile
- Today at 1:54 PM +0530: Add Dockerfile and Dockerfile

2. Click **Main.js**, then click the pencil icon to edit the file.

The screenshot shows the 'Main.js' file in a code editor. The code is as follows:

```
1 var express = require("express");
2 var bodyParser = require("body-parser");
3 var app = express();
4 app.use(bodyParser.urlencoded());
5 app.use(bodyParser.json());
6 var router = express.Router();
7
8 router.get('/message',function(req,res){
9   res.json({error : false, "message" : "Hello OOW!"}); // Change OOW to your name here...
10 });
11
12 router.post('/add',function(req,res){
13   res.json({error : false, "message" : "success", "data" : req.body.num1 + req.body.num2});
14 });
15
16 app.use('/',router);
17
18 app.listen(80,function(){
19   console.log("Listening at PORT 80");
20 })
```

3. Find where it says “Hello OOW!” and change “OOW” to your own name.

The screenshot shows the 'Main.js' file in a code editor with the line 'res.json({error : false, "message" : "Hello OOW!"});' highlighted. The 'Commit' button is visible at the bottom right of the editor.

4. Click **Commit**.

5. In the **Commit changes** dialog, click **Commit** to commit these changes to the NodeJSDocker.git's feature branch:



Milestone 6: Configure the Docker build job

In this section, we'll see how to use DevCS to build the Docker image for the Node.js REST application. We'll actually configure two build jobs, one for NodeJSDockerOCIR and one for NodeJSDockerHub.

Let's start with the NodeJSDockerOCIR build job.

Generate an Authentication Token to allow DevCS to access OCIR (OCI Registry) and store the docker image

- From the OCI console navigate to **Governance & Administration-> Identity -> Users**
- Select your user managed by Oracle Identity Cloud Service (i.e. oracleidentitycloudservice/myname@oracle.com where myname@oracle.com is your username)
- user you created earlier
- Click **Auth Tokens** under the Resources list on the bottom left of the page.
- Click **Generate Token**
- Provide a description
- **Copy this token for you records, It will not be showed again.**

1. Click **Build** in the left nav bar, then click **New / Create Job**.

The screenshot shows the Oracle Developer Cloud Service interface. The left sidebar has a dark theme with various project management icons: Project, Code, Maven, Environments, Releases, Snippets, Merge Requests, Issues, Agile, Build (which is highlighted in blue), and Deploy. The main content area is titled "John Dunbar OOW Hello | Build". It displays a "Build Queue" section with the message "No build in progress". Below this is a "Job Statistics" section with the message "No data available". At the bottom, there's a navigation bar with tabs for "Jobs" (which is active and highlighted in blue) and "Pipelines". Underneath these tabs are buttons for "All Jobs", "Successful Jobs", "Failed Jobs", and "Test Failed Jobs". A prominent green button labeled "New job" with the sub-label "Create a new job" is centered at the bottom of the main content area, with a mouse cursor hovering over it.

2. In the New Job dialog:
 - a. Type **NodeJS Docker OCIR** in the **Job Name** field

a. Type **NodeJS Docker OCIR** in the **Job Name** field

- b. Type Build and push Docker image to OCIR in the **Description** field
- c. Select **DockerTemplate** from the **Software Template** drop-down
- d. Click **Create Job**.

New Job

* Job Name: NodeJSDockerOCIR

Description: Build and Push Docker image to OCIR

Use for Merge Request

Create New Copy existing job

* Software Template: OOB_Template

Create Job **Cancel**

- 3. From the **Add Git** dropdown, select Git.

John Dunbar OOW Hello | Build

Jobs Overview > NodeJSDockerOCIR > Configure

Job Configuration

Source Control Build Parameters Build Environment Builders Post Build

Configure Source Control

Add Source Control ▾

Git

Save Cancel

- 4. Select NodeJSDocker.git from the **Repository** drop-down.
- 5. Select master from the **Branch** drop-down.
- 6. Click the **Automatically perform build on SCM commit** check box.

John Dunbar OOW Hello | Build

Jobs Overview > NodeJS Docker OCIR > Configure

Job Configuration

Source Control Build Parameters Build Environment Builders Post Build

Configure Source Control

Git

Repository: NodeJSdockergit

Branch: master

Automatically perform build on SCM commit

Add Source Control

Save Cancel

7. Click the **Steps** tab.
8. From the **Add Step** drop-down, select **Docker->Docker login**.

- a. Type <your home region code>.ocir.io in the **Registry Host** field (home code region example: **iad** for Ashburn; **phx** for Phoenix; **syd** for Sydney)
- b. Type <your tenancy name>/oracleidentitycloudservice/<your user name> in the **Username** field
- c. Type <the value of token you created and copied just above> in the **Password** field.

John Dunbar OOW Hello | Build

Jobs Overview > NodeJS Docker OCIR > Configure

Job Configuration

Source Control Build Parameters Build Environment **Builders** Post Build

Configure Builders

Docker login

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

Registry Host: e.g. 'quay.io', for Docker Hub leave empty

* Username: e.g. 'johndoe'

* Password: Password

Link External Registry

Save Cancel

9. From the **Add Step** drop-down, select **Docker -> Docker build**.

- a. Type <your home region code>.ocir.io in the **Registry Host** field (home code region example: **iad** for Ashburn; **phx** for Phoenix; **syd** for Sydney)
- b.

- c. Type <your tenancy name>/devcshol/nodejsmicro**jodu** in the **Image Name** field. Replace **jodu** with the first two letters of your first and last name, respectively.
- d. In the **Source** radio buttons, click **Context root in Workspace**.

10. From the **Add Step** drop-down, select **Docker ->Docker push**.

- Type iad.ocir.io in the **Registry Host** field
- Type `<your tenancy name>/devcshol/nodejsmicrojodu` in the **Image Name** field. Replace **jodu** with the first two letters of your first and last name, respectively.

The screenshot shows two configuration panels side-by-side. The left panel is titled "Docker build" and the right panel is titled "Docker push". Both panels have fields for Registry Host (set to "iad.ocir.io"), Image Name (set to "`john-doe/my-hello-world`"), and Version Tag (set to "1.7.0"). The "Docker build" panel also includes fields for Full Image Name ("options"), Options (empty), Source (set to "Context Root in Workspace"), Context Root in Workspace ("target"), and Dockerfile ("build_1_7/Dockerfile2"). The "Docker push" panel includes fields for Options (empty), Registry Host (empty), Image Name (empty), Version Tag (empty), and Full Image Name (empty).

11. Click **Save**.

The screenshot shows the "Job Configuration" screen for a job named "John Dunbar OOW Hello". The "Builders" tab is selected. Under "Configure Builders", there is a "Docker login" section. It contains fields for Registry Host (empty), Username ("john doe"), and Password ("password"). There is also a "Link External Registry" button. At the top right of the configuration screen, there are "Save" and "Cancel" buttons.

You've finished configuring the first build job, so now let's move on to the NodeJSDockerHub build.

- Click **Build** in the left nav bar.
- Click **Create Job**.

The screenshot shows the CircleCI web interface under the 'Build' tab for the user 'John Dunbar OOW Hello'. On the left, the 'Build Queue' section displays a message: 'No build in progress.' In the center, there's a table titled 'Jobs' with one row: 'NodeJS DockerHub' (Status: N/A, Last Success: N/A, Duration: < 1 Sec). On the right, the 'Job Statistics' section shows 'No data available'. At the bottom, there are tabs for 'All Jobs', 'Successful Jobs', 'Failed Jobs', and 'Test Failed Jobs', along with a search bar and a magnifying glass icon.

3. In the New Job dialog:

- a. Type **NodeJS DockerHub** in the **Job Name** field
- b. Type **Build** and push Docker image to DockerHub in the **Description** field
- c. Select **DockerTemplate** from the **Software Template** drop-down

The screenshot shows the 'New Job' dialog box. It has fields for 'Job Name' (NodeJS DockerHub), 'Description' (Build and Push Docker Image to DockerHub), and 'Software Template' (OOW_Template). There are checkboxes for 'Use for Merge Request' and radio buttons for 'Create New' (selected) and 'Copy existing job'. At the bottom are 'Create Job' and 'Cancel' buttons.

* Job Name	NodeJS DockerHub
Description	Build and Push Docker Image to DockerHub
<input type="checkbox"/> Use for Merge Request	
<input checked="" type="radio"/> Create New <input type="radio"/> Copy existing job	
* Software Template	OOW_Template
<input type="button" value="Create Job"/> <input type="button" value="Cancel"/>	

4. Click **Create Job**.
5. From the **Add Git** drop-down, select **Git**.

The screenshot shows the Jenkins 'Job Configuration' screen for a job named 'NodeJSHello'. The 'Source Control' tab is active. A dropdown menu labeled 'Add Source Control' is open, and the option 'Git' is selected.

6. Select **NodeJSDocker.git** in the **Repository** drop-down.
7. Select **master** from the **Branch** drop-down.

The screenshot shows the Jenkins 'Job Configuration' screen with the 'Source Control' tab selected. A 'Git' configuration dialog is open. The 'Repository' field contains 'NodeJSDocker.git' and the 'Branch' field contains 'master'. There is also an unchecked checkbox for 'Automatically perform build on SCM commit'.

8. Click the **Steps** tab.
9. From the **Add Step** drop-down, select **Docker -> Docker login**.
 - a. Type **odcsrepo** in the **Username** field
 - b. Type **odcsrepo** in the **Password** field.

10. From the **Add Step** drop-down, select **Docker ->Docker build**.

- Type **odcsrepo/nodejsmicrojodu** in the **Image Name** field. Replace **jodu** with the first two letters of your first and last name, respectively.
- In the **Source** radio buttons, click **Context root in Workspace**.

11. From the **Add Step** drop-down, select **Docker ->Docker Push**.

- Type **odcsrepo/nodejsmicrojodu** in the **Image Name** field. Replace **jodu** with the first two letters of your first and last name, respectively.

Docker build

* Registry Host:

* Image Name:

Version Tag:

Full Image Name:

Options:

* Source: Context Root in Workspace
 Dockerfile Text:
 Remote Context Root:

Context Root in Workspace:

Dockerfile:

Docker push

Options:

* Registry Host:

* Image Name:

Version Tag:

Full Image Name:

12. Click **Save**.

Milestone 7: Create and execute the build pipeline

In this section, we'll create a pipeline to run the two build jobs we just created.

1. Click **Build** in the left nav, then click the **Pipelines** tab:

The screenshot shows the 'Pipelines' tab selected in the navigation bar. The 'Build Queue' section indicates 'No build in progress'. The 'Job Statistics' section shows a green circle with '100%' and a 'Success' status. A 'New Pipeline' button is visible at the bottom.

2. Click **Create Pipeline**.
3. Let's use **DockerPipeline** as the name.
4. Select both check boxes, as shown here:

Create Pipeline

Name: **DockerPipeline**

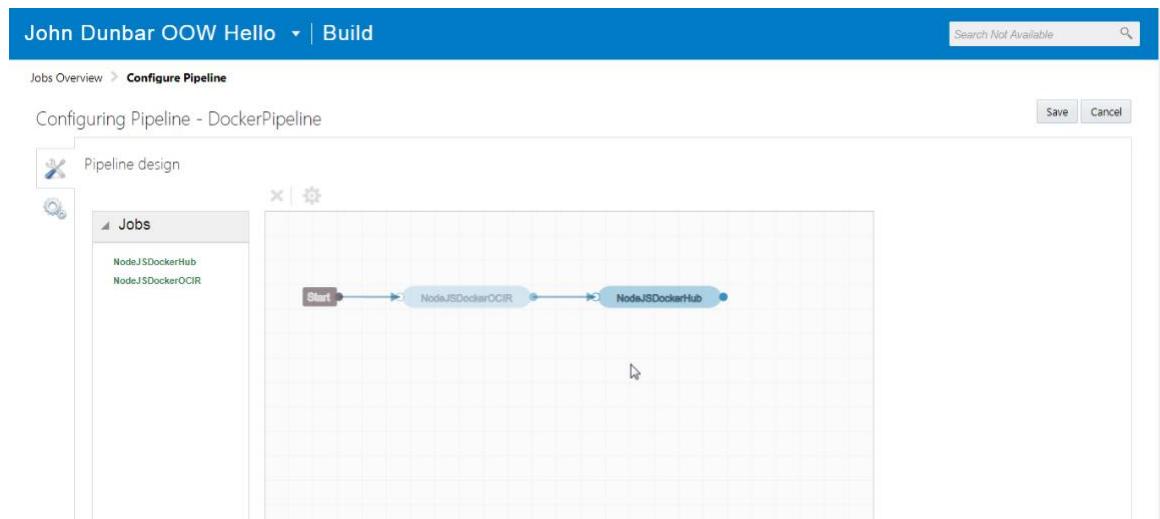
Description:

Auto start when pipeline jobs are built externally

Disallow pipeline jobs to build externally when the pipeline is building

Create **Cancel**

5. Click **Create**.
6. Drag NodeJSDockerOCIR to the gridded area, and drop it right after the **Start** bubble.
7. Drag NodeJSDockerHub and drop it right after NodeJSDockerOCIR.
8. User the cursor to draw arrows between them, as shown here:

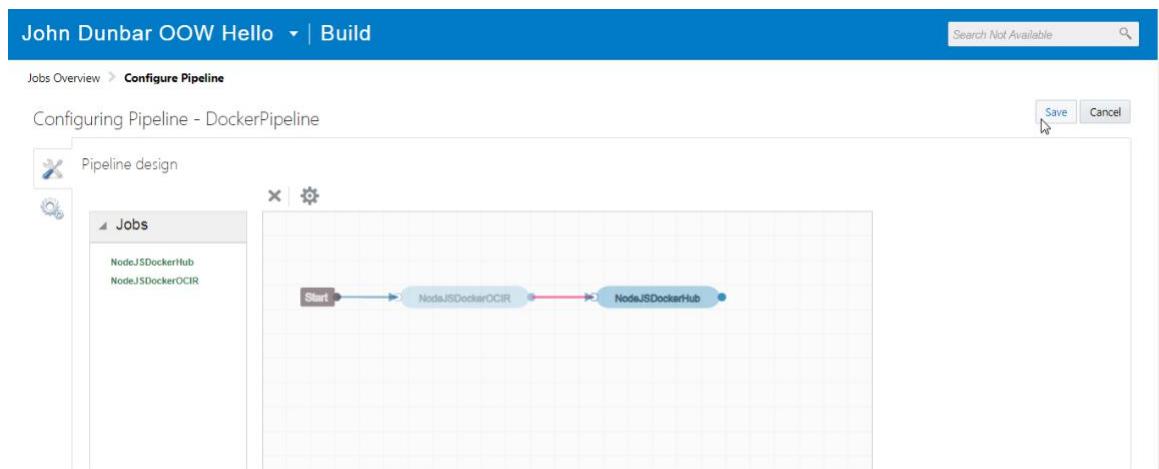


9. Double-click the line connecting the two build jobs.
10. In the editor, select Successful from the **Result Condition** drop-down:



11. Click **Apply**.

12. Click **Save**:



Milestone 8: Merge your feature branch with the master branch of the NodeJS Docker.git repository

In this section, we explore how to review and merge code in DevCS.

1. Click **Merge Requests** in the left nav bar:

```
1 var express = require('express');
2 var bodyParser = require('body-parser');
3 var app = express();
4 app.use(bodyParser.urlencoded());
5 app.use(bodyParser.json());
6 var Router = express.Router();
7
8 router.get('/message', function(req,res){
9   res.send("Hello World");
10 });
11
12 module.exports = router;
```

2. Click **Create Merge Request**:

Merge Request	Repository	Status	Changed
No data to display.			

3. In the New Merge Request dialog:

- Select NodeJsDocker.git from the **Repository** drop-down
- Select master as the **Target Branch**
- Select feature as the **Review Branch**
- Click the commit that appears for the review branch
- Click **Next**.

New Merge Request

Branch

Details

Description

* Repository NodeJS Docker.git

* Target Branch master

* Review Branch feature

alexadmin Today
8def1a5 Update Main.js

Back Next >

Create Cancel

4. On the Details page:

- a. Select yourself as the reviewer under **Reviewers**
- b. In the **Linked Issues** field, type Task until you see the task you created earlier.
- c. Click the task description
- d. Click **Next**.

New Merge Request

Back Branch Details Description Next >

Linked Issues: Task

Task 1: Change the message in Main.js

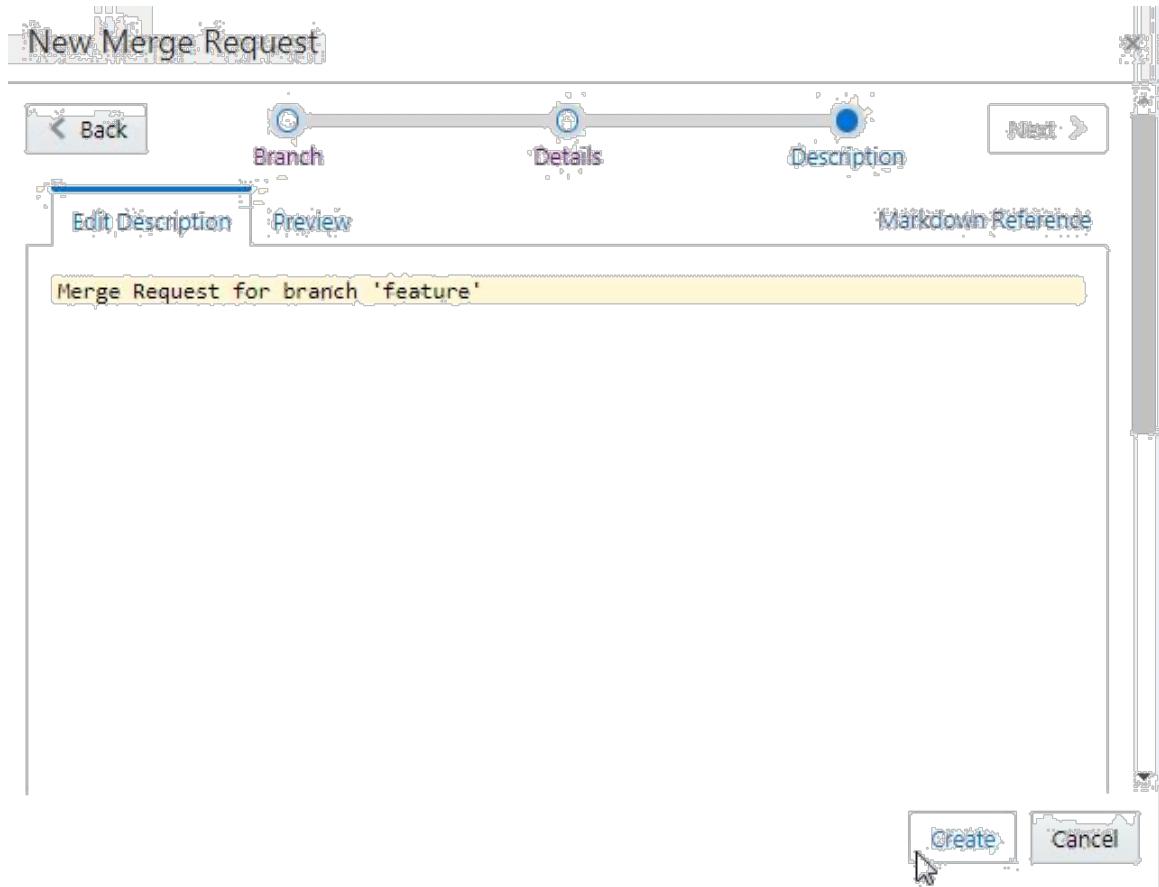
Tags: Select Tags

Summary: Merge Request for branch 'feature'

* Reviewers: Alex Admin X

Create Cancel

5. Review the description and click **Create**:



6. Click the **Changed Files** tab and review the changes:

File	Changes
Main.js	+2 -2

```

diff --git a/Main.js b/Main.js
index 867..0000000 100644
--- a/Main.js
+++ b/Main.js
@@ -9,7 +9,7 @@ router.get('/message',function(req,res){
   res.json({"error": false, "message": "Hello OO!"}); // Change OO to your name here...
   res.json({"error": false, "message": "Hello Abhinav!"); // Change OO to your name here...
 });
@@ -12,7 +12,7 @@ router.post('/add',function(req,res){
   app.listen(80,function(){
     console.log("Listening at PORT 80");
   })
}

```

7. If the changes look correct, click **Approve**:

John Dunbar OOW Hello | Merge Requests

Merge Requests > 2 · Task 1 · Change the message in Main.js

OPEN Alex Admin wants to merge 1+ commits to **master** from **feature** in **NodeJSDocker.git**

Conversation **Commits (1+)** **Changed Files (1)** **Unified Diff (1)** **Unmerged (0)** **1** **2** **3** **4** **5** **6** **7** **8** **9** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31** **32** **33** **34** **35** **36** **37** **38** **39** **40** **41** **42** **43** **44** **45** **46** **47** **48** **49** **50** **51** **52** **53** **54** **55** **56** **57** **58** **59** **60** **61** **62** **63** **64** **65** **66** **67** **68** **69** **70** **71** **72** **73** **74** **75** **76** **77** **78** **79** **80** **81** **82** **83** **84** **85** **86** **87** **88** **89** **90** **91** **92** **93** **94** **95** **96** **97** **98** **99** **100** **101** **102** **103** **104** **105** **106** **107** **108** **109** **110** **111** **112** **113** **114** **115** **116** **117** **118** **119** **120** **121** **122** **123** **124** **125** **126** **127** **128** **129** **130** **131** **132** **133** **134** **135** **136** **137** **138** **139** **140** **141** **142** **143** **144** **145** **146** **147** **148** **149** **150** **151** **152** **153** **154** **155** **156** **157** **158** **159** **160** **161** **162** **163** **164** **165** **166** **167** **168** **169** **170** **171** **172** **173** **174** **175** **176** **177** **178** **179** **180** **181** **182** **183** **184** **185** **186** **187** **188** **189** **190** **191** **192** **193** **194** **195** **196** **197** **198** **199** **200** **201** **202** **203** **204** **205** **206** **207** **208** **209** **210** **211** **212** **213** **214** **215** **216** **217** **218** **219** **220** **221** **222** **223** **224** **225** **226** **227** **228** **229** **230** **231** **232** **233** **234** **235** **236** **237** **238** **239** **240** **241** **242** **243** **244** **245** **246** **247** **248** **249** **250** **251** **252** 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John Dunbar OOW Hello ➔ | Merge Requests

Merge Requests > 2 Task 1 - Change the message in Main.js

OPEN  Alex Admin wants to merge 1 commits to master from feature in NodeJS Docker.git

Conversation Community (1+) Changed Files (1) Listed Issues (0) Listed Pulls (0)

Main.js ↗ 2:2

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 79 80 81 82 83 84 85 86 87 88 89 89 90 91 92 93 94 95 96 97 98 99 99 100 101 102 103 104 105 106 107 108 109 109 110 111 112 113 114 115 116 117 118 119 119 120 121 122 123 124 125 126 127 128 129 129 130 131 132 133 134 135 136 137 138 139 139 140 141 142 143 144 145 146 147 148 149 149 150 151 152 153 154 155 156 157 158 159 159 160 161 162 163 164 165 166 167 168 169 169 170 171 172 173 174 175 176 177 178 179 179 180 181 182 183 184 185 186 187 188 189 189 190 191 192 193 194 195 196 197 198 199 199 200 200 201 202 203 204 205 206 207 208 209 209 210 211 212 213 214 215 216 217 218 219 219 220 221 222 223 224 225 226 227 228 229 229 230 231 232 233 234 235 236 237 238 239 239 240 241 242 243 244 245 246 247 248 249 249 250 251 252 253 254 255 256 257 258 259 259 260 261 262 263 264 265 266 267 268 269 269 270 271 272 273 274 275 275 276 277 278 279 279 280 281 282 283 284 285 285 286 287 288 289 289 290 291 292 293 294 295 295 296 297 298 299 299 300 300 301 302 303 304 305 306 307 308 309 309 310 311 312 313 314 315 316 317 317 318 319 319 320 321 322 323 324 325 325 326 327 328 329 329 330 331 332 333 334 335 335 336 337 338 339 339 340 341 342 343 344 345 345 346 347 348 349 349 350 351 352 353 354 355 355 356 357 358 359 359 360 361 362 363 364 365 365 366 367 368 369 369 370 371 372 373 374 375 375 376 377 378 379 379 380 381 382 383 384 385 385 386 387 388 389 389 390 391 392 393 394 394 395 396 397 398 398 399 399 400 400 401 402 403 404 404 405 406 407 408 408 409 410 411 412 412 413 414 415 416 416 417 418 419 419 419 420 421 422 422 423 424 425 425 426 427 428 428 429 429 430 431 432 432 433 434 435 435 436 437 438 438 439 439 440 441 442 442 443 444 445 445 446 447 448 448 449 449 450 451 452 452 453 454 455 455 456 457 458 458 459 459 460 461 462 462 463 464 465 465 466 467 468 468 469 469 470 471 472 472 473 474 475 475 476 477 478 478 479 479 480 481 482 482 483 484 485 485 486 487 488 488 489 489 490 491 492 492 493 494 495 495 496 497 498 498 499 499 500 500 501 502 503 503 504 505 506 506 507 508 509 509 509 509 510 511 512 512 513 514 515 515 516 517 518 518 519 519 520 521 522 522 523 524 525 525 526 527 528 528 529 529 530 531 532 532 533 534 535 535 536 537 538 538 539 539 540 541 542 542 543 544 545 545 546 547 548 548 549 549 550 551 552 552 553 554 555 555 556 557 558 558 559 559 560 561 562 562 563 564 565 565 566 567 568 568 569 569 570 571 572 572 573 574 575 575 576 577 578 578 579 579 580 581 582 582 583 584 585 585 586 587 588 588 589 589 590 591 592 592 593 594 595 595 596 597 598 598 599 599 600 600 601 602 603 603 604 605 606 606 607 608 609 609 609 609 610 611 612 612 613 614 615 615 616 617 618 618 619 619 620 621 622 622 623 624 625 625 626 627 628 628 629 629 630 631 632 632 633 634 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1988 1989 1989 1990 1991 1992 1992 1993 1994 1995 1995 1996 1997 1998 1998 1999 1999 2000 2001 2002 2002 2003 2004 2005 2005 2006 2007 2008 2008 2009 2009 2010 2011 2012 2012 2013 2014 2015 2015 2016 2017 2018 2018 2019 2019 2020 2

10. Keep the defaults, then click **Create a Merge Commit**.

Merge

Remember my choice

Create a Merge Commit

i The 1 commits from branch 'feature' will be added to the branch 'master' via a merge commit
Merge commit with two parents will be created (non-fast-forward)

Merge Request 2 from 'feature' into 'master'

Resolved issues:
1) Task 1 - Change the message in Main.js.

Post Merge Actions

Delete branch

Resolve linked issues

Task 1 - Change the message in Main.js

You should now see the Review Status as Approve, with a green tick.

This merge will trigger the execution of the **NodeJSDockerOCIR** build job, which in turn will trigger the execution of the **DockerPipeline**.

The screenshot shows a 'Merge Requests' page with a single merged pull request. The pull request details are as follows:

- Merge Requests: 2 Task 1 - Change the message in Main.js
- MERGED acc52a3 · Alex Admin merged 1+ commits to master from feature in NodeJSDecker/git
- Conversation (1+), Commits (1+), Changed Files (0), Linked Issues (0), United Builds (0)
- Review Status: APPROVE by Alex Admin

The conversation log includes the following entries:

- Alex Admin applied 1 commits 48 minutes ago: Update Main.js
- Alex Admin approved Task 1 - Change the message in Main.js: ok
- Alex Admin merged branch 'feature' into 'master' just now: acc52a3 Merge Request 2 from 'feature' into 'master'

11. Click **Build** in the left nav bar.

12. Click **Jobs**:

The 'Build' page displays the 'Job Queue' section with the following information:

- Job: NodeJSDeckerOCIR
- Build: #6
- Scheduled: Just now
- Progress: Waiting for Executor

On the right, the 'Job Statistics' section shows a green circle indicating 100% success.

The main table lists the following build jobs:

Jobs	Pipelines	All Jobs	Successful Jobs	Failed Jobs	Test Failed Jobs
Status Weather Job	Last Success	Last Unsuccess	Duration	Actions	
✓ ☀ NodeJSDeckerHub	#3 10 min	13 hrs	30 secs		
✓ ☁ NodeJSDeckerOCIR	#5 11 min	37 min	1 mins 33 secs		

You should see your two build jobs, waiting to be built.

13. Click the **NodeJSDeckerOCIR** build job.

14. Click **Build Log**, as shown here:

John Dunbar OOW Hello | Build

Jobs Overview > NodeJS Docker OCIR

Job Details

Build and Push Docker Image to OCIR

Notifications: On (CC Me)

Build History

By	Status	Build	Started	Duration	Actions
	Success	#41	12 minutes ago	1m 38s	View Details
	Success	#42	14 minutes ago	18s	View Details

Build Trend

Build Number	Duration
4	~1m 38s
5	~1m 38s
6	~1m 38s

15. Take a look at the log for the NodeJS DockerOCIR build job.

```

----> 404cf4a823ae
Successfully built 404cf4a823ae
Using docker://bin/docker
/bin/docker push iad.ocir.io/devcstest/oowhol/nodejsmicrojobu
The push refers to a repository [iad.ocir.io/devcstest/oowhol/nodejsmicrojobu]
db41ee45fcfb9: Preparing
74371bfbfe3e: Preparing
2343c7967ba4: Preparing
6c9a1bc6b767: Preparing
f059848e1802: Preparing
2793dc0607dd: Preparing
74800c25aa8c: Preparing
ba504a540674: Preparing
ba504a540674: Preparing
81101ce649d5: Preparing
daf45b2cad9a: Preparing
8c466bf4ca6f: Preparing
2793dc0607dd: Waiting
74800c25aa8c: Waiting
ba504a540674: Waiting
81101ce649d5: Waiting
daf45b2cad9a: Waiting
8c466bf4ca6f: Waiting
74371bfbfe3e: Layer already exists
f059848e1802: Layer already exists
db41ee45fcfb9: Layer already exists
6c9a1bc6b767: Layer already exists
2793dc0607dd: Layer already exists
ba504a540674: Layer already exists
74800c25aa8c: Layer already exists
81101ce649d5: Layer already exists
daf45b2cad9a: Layer already exists
8c466bf4ca6f: Layer already exists
2343c7967ba4: Layer already exists
latest digest: sha256:31b304cc366a64f48032282918dc7c9e5a8b670db18463cbea2b8d46860447dd size: 2632
/bin/docker logout iad.ocir.io
Remove login credentials for iad.ocir.io
Slave log size 2.1 KB (2,141)

Build completed.
Status: DONE Result: SUCCESSFUL Duration: 26 sec

```

16. Click the NodeJS DockerHub build job and take a look at its build log too:

Job Details

Build and Push Docker Image to DockerHub

Notifications: On

Build History

By	Status	Build	Started	Duration	Actions
John Dunbar	Success	#1	49 minutes ago	50 s	View Log Delete
John Dunbar	Success	#2	29 minutes ago	24 s	View Log Delete
John Dunbar	Success	#3	29 minutes ago	24 s	View Log Delete
John Dunbar	Success	#4	49 minutes ago	44 s	View Log Delete

Build Trend

Duration (s)

Build Number

Legend: Canceled (red), Failed (orange), Test Failed (yellow), Success (green)

17. Inspect the build job:

John Dunbar OOW Hello | Build

Jobs Overview > NodeJS DockerHub > #4 > Log

Build Log

Download Log

```

Build scheduled. Build started by pipeline DockerPipeline [Upstream Job: NodeJS DockerOCIR Build: #6]
Build task id: 129ee178-8255-4128-8023-f5abd512de95
Build execution started.
Building on slave OOW_Template
Git: Checkout directory is the workspace root.
Git: Fetching from remote repository https://devinstance4wd8us2-wd4devcs8us2.uscom-central-1.oraclecloud.com/devinstance4wd8us2-wd4devcs8us2/s/devinstance4wd8us2-wd4devcs8us2_john-dunbar-oow-
hello_52638cm/NodeJS Docker.git
Git: Checking out branch master
Git: Done
Using docker /bin/docker
/bin/docker login -u odcsexpo -p **** https://index.docker.io/v1/
Flag --email has been deprecated, will be removed in 1.13.
Login Succeeded
Using docker /bin/docker
/bin/docker build -t odcsexpo/nodejsmicrojodu .
Sending build context to Docker daemon 74.24 kB

Step 1 : FROM node:6
--> f64a15ead359
Step 2 : ADD Main.js .
--> Using cache
--> 004b36f9e212
Step 3 : ADD package.json .
--> Using cache
--> 97af4b87d5d3
Step 4 : RUN npm install
--> Using cache

```

18. Open Google Chrome and go

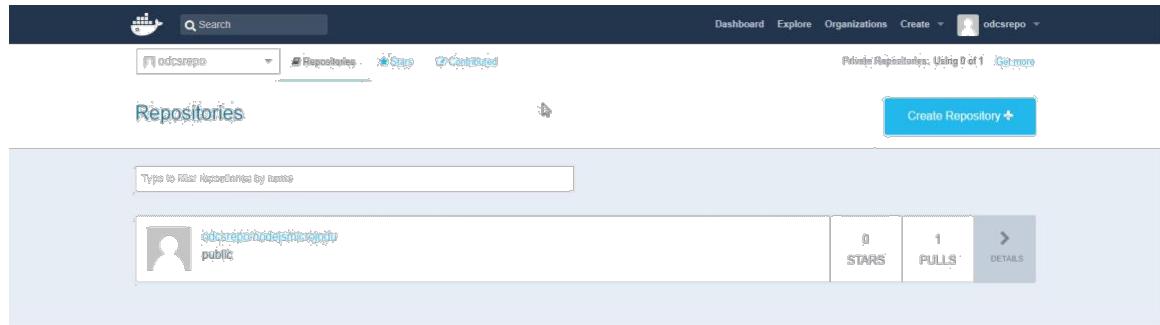
to: <https://hub.docker.com>

19. Sign in using these credentials:

Username: odcsexpo

Password: odcsexpo

You should see your Docker image in the repository!



Summary

Now that you've finished this lab, you should know how to build a pipeline to build and push a Docker image to Oracle Cloud Infrastructure Registry and DockerHub registry using Developer Cloud. Specifically, you learned how to:

- Work with Oracle Developer Cloud Service and its most important features
- Create a project and pull the code from an existing GitHub repository to a DevCS-hosted Git repository
- Create a task within DevCS and an Agile board to track it
- Complete the task by branching the code, editing it using the online editor, and merging the code
- Build the Docker image with Continuous Integration in DevCS
- Push the Docker image to the Oracle Cloud Infrastructure Registry and DockerHub.