OCI Registry Service

Level 100

Jamal Arif
Oracle Cloud Infrastructure
November, 2019
Safe harbor statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions.

The development, release, timing, and pricing of any features or functionality described for Oracle’s products may change and remains at the sole discretion of Oracle Corporation.
Objectives

After completing this lesson, you should be able to:

• Use the OCI Registry Service
• Create Policy Requirements for OCIR
• Manage Repos using OCIR
• Pull an image from OCIR with OKE
• Set Global image retention policies
Introducing Oracle Cloud Infrastructure Registry - OCIR

What is It?
- A high availability Docker v2 container registry service
- Stores Docker Images in Private or Public Repositories.
- Runs as a fully managed service on Oracle Cloud Infrastructure.

What Problems Does it Solve?
- Without a registry it is hard for Development teams to maintain a consistent set of Docker images for their containerized applications
- Without a managed registry it is hard to enforce access rights and security policies for images
- It is hard to find right images and have them available in the region of deployment

Key Benefits
- Full integration with Container Engine for Kubernetes (OKE)
- Registries are private by default, but can be made public by an admin
- Co-located regionally with Container Engine for low latency Docker image deploys
- Leverages OCI for high performance, low latency and high availability
Working with OKE and OCIR on OCI

- OCI Registry (OCIR)
  - In-flight and at rest data encryption

- OCI Container Engine for Kubernetes (OKE)
  - Cluster Management
  - HA - 3 Masters/etcd across 3 ADs
  - Container Engine Dashboard

- Customer's OCI Account/Tenancy
  - VM based Clusters and Nodes
  - Bare Metal Clusters and Nodes

Oracle Cloud Infrastructure

Oracle Managed

Customer Managed
OKE/OCIR Pricing and Packaging

- **OCI Registry**: Free
  - In-flight and at rest data encryption
- **OCI Container Engine for Kubernetes**: Free
  - Cluster Management
  - HA - 3 Masters/etcd across 3 ADs
  - Container Engine Dashboard
- **Customer's OCI Account/Tenancy**: Pay only for the OCI resources used to run your K8s clusters (VM’s, storage, LB, etc.) and store your images

Oracle Cloud Infrastructure

- Oracle Managed
- Customer Managed
Pre-requisites for OCIR

• To use registry service, user is either a part of the admin group or part of a group to which a policy grants the appropriate permissions

  allow group acme-viewers to inspect repos in tenancy  –  Ability to see a list of all repositories in Oracle Cloud Infrastructure Registry belonging to the tenancy

  allow group acme-managers to manage repos in tenancy  –  Ability to perform any operation on any repository in Oracle Cloud Infrastructure Registry that belongs to the tenancy (Pull an image, push an image, create/delete repos etc.)

  Note: repos are tenancy-level resources, policies controlling access to them need to go into the root compartment (i.e., the tenancy).

• User needs to have an OCI username and auth token before being able to push/pull an image.
OCIR Repositories

- Repositories can be private or public.
- Any user with internet access and knowledge of the appropriate URL can pull images from a public repository in Oracle Cloud Infrastructure Registry.
- To Create a Repository via Console
  
  Containers → Registry → Create Repository
  Repository Name
  Public or Private

![Create Repository Console](image)
Push/Pull images from OCIR

- You use Docker CLI to push/pull images to repos in OCI
- Create a Auth Token for User and copy it
- Login into OCIR
  ```
docker login <region-code>.ocir.io
  <tenancy_namespace>/<username>
  Auth-token
  ```

What is Tenancy namespace

- Find images in your local repository to be pushed to OCIR and tag in the format
  ```
  <region-code>.ocir.io/<tenancy-namespace>/<repos-name>/<image-name>:<tag>
  ```
  ```
docker tag 9f1191b287da iad.ocir.io/jamalarif/testing/tomcat:1.2
  ```
- Push your tagged image to OCIR
  ```
docker push iad.ocir.io/jamalarif/testing/tomcat
  ```
- Similarly images can be pulled using docker pull
  ```
docker pull <region-code>.ocir.io/<tenancy-namespace>/<repos-name>/<image-name>:<tag>
  ```
  ```
docker pull iad.ocir.io/jamalarif/testing/tomcat:1.2
  ```

<table>
<thead>
<tr>
<th>Region Code</th>
<th>Region Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>phx</td>
<td>Phoenix</td>
</tr>
<tr>
<td>iad</td>
<td>Ashburn</td>
</tr>
<tr>
<td>fra</td>
<td>Frankfurt</td>
</tr>
<tr>
<td>lhr</td>
<td>London</td>
</tr>
<tr>
<td>icn</td>
<td>Seoul</td>
</tr>
<tr>
<td>nrt</td>
<td>Tokyo</td>
</tr>
<tr>
<td>yyz</td>
<td>Toronto</td>
</tr>
</tbody>
</table>
## OCIR Image Layers

### Registry

<table>
<thead>
<tr>
<th>Layers</th>
<th>Associated Tags</th>
<th>Size</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>43.22 MB</td>
<td>Fri, 18 May 2018 06:54:46 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>10.27 MB</td>
<td>Fri, 18 May 2018 06:52:57 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>4.14 MB</td>
<td>Fri, 18 May 2018 06:52:36 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>833.1 KB</td>
<td>Fri, 18 May 2018 06:52:05 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>247 B</td>
<td>Fri, 18 May 2018 06:51:56 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>130 B</td>
<td>Fri, 18 May 2018 06:51:56 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>118.48 MB</td>
<td>Fri, 18 May 2018 06:56:20 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>263.74 KB</td>
<td>Fri, 18 May 2018 06:51:54 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>150 B</td>
<td>Fri, 18 May 2018 06:51:53 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>518.32 KB</td>
<td>Fri, 18 May 2018 06:51:55 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>11.21 MB</td>
<td>Fri, 18 May 2018 06:52:29 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>131 B</td>
<td>Fri, 18 May 2018 06:51:53 GMT</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>15.97 KB</td>
<td>Fri, 18 May 2018 06:56:23 GMT</td>
</tr>
</tbody>
</table>

**Full Path:** jamjar1/testing/tomcat:1.2  
**Pushed by:** user@email.address.com  
**Date:** 20 minutes ago  
**Size:** 185.91 MB
Pulling images from Registry for Kubernetes Deployments

Step 1: Create an Auth Token
Pulling images from Registry for Kubernetes Deployments

Step 2: Create docker registry secret and use Auth Token

- Create a Docker registry secret, containing the Oracle Cloud Infrastructure credentials to use when pulling the image.

```bash
kubectl create secret docker-registry <secret-name> --docker-server=<region-code>.ocir.io --docker-username='<tenancy-namespace>/<oci-username>' --docker-password='<oci-auth-token>' --docker-email='<email-address>'
```
Pulling images from Registry for Kubernetes Deployments (2)

- Specify the image to pull from Oracle Cloud Infrastructure Registry, including the repository location and the Docker registry secret to use, in the application's manifest file.

```yaml
apiVersion: v1
deployment:
  metadata:
    name: nginx-image
  spec:
    containers:
      - name: nginx
        image: iad.ocir.io/jamalarif/testing/nginx:1.1
        imagePullPolicy: Always
        ports:
          - name: nginx
            containerPort: 8080
            protocol: TCP
        imagePullSecrets:
          - name: ocirsecret
```
OCIR Image Retention Policies

• Set up image retention policies to automatically delete images that meet particular selection criteria. Following rules can be applied:
  - images that have not been pulled for a certain number of days
  - images that have not been tagged for a certain number of days
  - images that have not been given particular Docker tags specified as exempt from automatic deletion
• **Hourly process** checks images against the selection criteria and deletes images accordingly.
• A global Image retention policy pre-exists with default selection criteria to retain all images.
• Users can edit global image retention policy or create their own custom policy.
• Policies are regional and applied on repository level.
• Repos can only be part of one image retention policy at a time.
• Once the policy is created, first time it can take several hours to take effect known as cooling period to avoid unintentional deletion of images.
OCIR Image Retention Policies (2)

- On OCIR Home page, Click **Settings**, and then select **Image retention policies**.

Edit the Global Image Retention Policy

Create a new custom image retention policy
OCIR Image Retention Policies (3)

- Select the criteria and number of days for each policy
- Provide image tag to prevent images from being deleted
- Once the policy is created, add repositories by clicking on + Add repository
- Remove the repos from the policy by removing them
Demo

Summary

• Use the OCI Registry Service
• Create Policy Requirements for OCIR
• Manage Repos using OCIR
• Pull an image from OCIR with OKE
• Set Global image retention policies
Oracle Cloud always free tier: oracle.com/cloud/free/


OCI hands-on labs: ocitraining.qloudable.com/provider/oracle

Oracle learning library videos on YouTube: youtube.com/user/OracleLearning