Red Hat Certified Specialist in OpenShift Automation and Integration exam (EX380)

Duration: 3 Hrs
Max.Mark: 300
Pass Mark: 210

INTIAL INSTRUCTION:

1. **General**
   a. In the exam they will provide you the initial credentials viz **ocpadm** for logging into cluster as will logging in to workbench VM
   b. We have to use those credentials throughout the exam session unless otherwise it is specifically mentioned to do so to change.

2. **System Information**

S.NO	*DOMAIN NAME*	*Role*	*IP ADDRESS*
1	Workbench.lab.example.com	Jump server	172.25.250.11
2	Master01.lab.example.com	Master node	172.25.250.12
3	Master02.lab.example.com	Master node	172.25.250.13
4	Master03.lab.example.com	Master node	172.25.250.14
5	worker1.lab.example.com	Worker Node	172.25.250.14
6	worker2.lab.example.com	Worker node	172.25.250.15
7	Utility.lab.example.com or registry.lab.example.com	Registry, Git server, NFS Server, Repository	172.25.250.16
8	API Server URL	API Access	https://api.ocp4.example.com:6443
9	Cluster Web Console	Console Access	https://console-openshift-console.apps.ocp4.example.com

   a. Initially log in to in to workbench VM using the provided credentials in the first setup.

b. The for logging to the cluster you will be provided with the kubeadmin user information, through a file path in the workbench machine eg. /usr/locat/etc/ocp4.config

3. **Exam References**
   a. You will be provided a registry with the name like 'registry.ocp4.example.com:8443' using which you will be able to pull the images and able to login in to using podman tool. Registry user name & password will be also provided. In Lab user is **developer**, password is also **developer**.
   b. Documentation about openshift can be accessed at the following url: ***https://access.redhat.com/documentation/en-us/openshift_container_platform/4.10/***

Question Outline

1. Configure LDAP identity provider
2. Deploy an application using ansible
3. Configure Alert-manager
4. Migrate Application
5. Configure an Cronjob
6. NTP Configuration
7. Install an Operator
8. Configure an application to use persistent storage
9. Pod scheduling
10. Install OpenShift logging

1. Configure LDAP identity provider

Configure authentication using LDAP.

Note (not for exam): **'lab auth-ldap start'** run this lab setup command on workstation for initial setup

- Create a ldap-secret that contains the LDAP bind password Redhat123@! in the bindPassword key.
- Create a ca-config-map that contains the IdM certificate in the ca.crt key. The IdM certificate is at http://idm.ocp4.example.com/ipa/config/ca.crt

- You can use the ~/DO380/labs/auth-ldap/ldap-cr.yml file as a template to add an LDAP identity provider to the OpenShift.

  Configure the LDAP identity provider to:
  - Identity Provider to be named as ldapidp
  - Bind to the LDAP identity provider as admin user
  - Use **ldaps://idm.ocp4.example.com** as the LDAP URL.
  - Use the **id** LDAP attribute as the **dn**.
  - Use the **email** LDAP attribute as the **mail**.
  - Use the **name** LDAP attribute as the **cn**.
  - Use the **preferred user name** LDAP attribute as the **uid**.
  - **bindDN:** uid=admin,cn=users,cn=accounts,dc=ocp4,dc=example,dc=com
  - Verify that you can log in as the 'openshift-user' with the 'openshift-user' password '.
  [**note:** In exam you will be provided with some real-time names viz Edwin]
  - Provide cluster admin role for 'openshift-user' user so that following api call works

curl -sk --header "Authorization: Bearer $TOKEN" -X GET
https://api.ocp4.example.com:6443/api/v1/pods/ | jq ".items[].metadata.name"

2. **Deploy an application using ansible**

Note (not for exam): Use Git for question directories: **git clone https://github.com/dumpdev/ex380.git**

Deploy the application on OpenShift using the ansible. You're provided with default content in the directory 'ansible' at /home/student/ex380/ansible

Once application deployed should be reachable at the following URL

http://game-opengame.apps.ocp4.example.com

Note: In exam playbook will have more than 10 indentation mistakes.

3. **Configure Alert-manager**

Note (not for exam): 'lab monitor-alerts start' run this lab setup command on workstation for initial setup

Configure Alertmanager to send email notifications for all warning alerts. Use the values as below. Use the template in /home/student/ex380/alerts/alertmanager.yaml

[Note: In Exam you will be provided template in certain path.]

smtp_smarthost: 192.168.50.254:25
smtp_from: alerts@ocp4.example.com
smtp_require_tls: false
receiver: email-notification
to: ocp-admins@example.com
repeat_interval: 2m (default)

You are not required to configure a secure connection from Alertmanager to the SMTP host.
The ocp-admins@example.com email alias sends messages to the lab user on utility.lab.example.com.

Note: In exam you need check to email reception in workbench

4. **Migrate Application**

   Migrate the Kubernetes workloads to OpenShift.
   You're provided with default content in the directory 'kubemigrate' at /home/student/ex380/kubemigrate.

   ▪ Use the image archive landing.tar for application build, tag it with redhat-landing version latest. [in exam it will be available]
   (**Note:** During practice run 'sh land.sh' to simulate landing.tar)
   ▪ Migration Emphasizes availability over consistency.
   ▪ The future changes in remote images should trigger the rebuild of the application.
   ▪ Service uses port 8080
   ▪ Once migrated application should be reachable from OpenShift, through the following URL
   http://landing.apps.ocp4.example.com

5. **Configure an Cronjob**

Deploy a cronjob

   ▪ Cronjob should be part of maxim project
   ▪ Cronjob takes name as the application image.

- Use the image quay.io/redhattraining/scaling
- The Job should be executed at 4.05 every 2nd day of the month.
- Use Service account called magnum
- Successful Job Limit should be 5.

6. NTP Configuration

You must set the time server and related settings used by the chrony time service (chronyd) by the contents of the chrony.conf file and passing those contents to your nodes as a machine config.

You're provided with default configuration content in the directory 'machine' at /home/student/ex380/machine

- Use the '**chrony.conf**' file for NTP time configuration
- Create custom Machine Configs for **worker nodes**.
- Use the name as '**77-worker-chrony**'
- Don't Change the worker node labels.

[**Note:** In exam they may ask you to implement machineConfig for master nodes also.]

7. Install an Operator

- Install File Integrity operator in the **openshift-file-integrity** project.
- Operator should have **release-0.1** channel.
- **Cluster Monitoring** should be enabled for the operator's project.
- Operator should **automatically** update itself through OLM.

8. Configure an application to use persistent storage

Create a **PV** for the application
- Storage instance should be named '**lamda-pv**'
- PV should be of size **2Gi**
- **Reclaim policy** should align with NFS storage-class
- Claim mode should be '**ReadWriteMany**'
- **NFS Server:** 192.168.50.254
- **NFS path:** /exports-ocp4
  - **Note:** In exam NFS Details should be retrieved from storageclass
  - **Use oc command:** 'oc get storageclass <name> -o yaml'

Create a **PVC** for the application

- Create a PVC named '**lamdapvc**' for galaxy project
- PVC should of size **2Gi**
- Claim mode should be '**ReadWriteMany**'
- PVC should bind to **'lamda-pv'**

Deploy Application in the project

- Create app named for the application '**lamda**'
- No. of Replicas is **2**
- Application should be on project **galaxy**
- Application uses the image- **quay.io/redhattraining/hello-world-nginx**
- Provision storage for the file system **/srv**
- Application should be reachable at the following URL
  https://lamda.apps.ocp4.example.com

9. Pod scheduling

Recover the failed node

Note (not for exam): **'lab workers-degrade start'** run this lab setup command on workstation for initial setup

- Make sure worker01 persist to join cluster after reboot.
- Deploy the application in catalog project to always run on worker01.

  (During practice use git path on local system '~/ex380/schedule' directory for app deploy use 'oc create -f genapp.yaml')

10. Install OpenShift Logging:

Note (not for exam): 'lab logging-deploy start' run this lab setup command on workstation for initial setup

Deploying Cluster Logging:

- Install Red Hat OpenShift Logging.
- For **elastic-search operator** use the namespace 'openshift-operators-redhat'
- For **cluster-logging operator** use the namespace 'openshift-logging'
- Necessary templates are provided at /home/student/ex380/logging
- Create EventRouter instance in openshift-logging namespace.

- For **Event-router** use the use template at /home/student/ex380/logging, use the customized image parameter as

registry.ocp4.example.com:8443/openshift-logging/eventrouter-rhel8:v0.3.0-212

- Add the Event Router to openshift-logging project.
- OpenShift Logging instance uses **redundancyPolicy: "MultipleRedundancy"**. Use cl-minimal.yml file.
- Create the app and infra index pattern with timestamp filter.