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Quotas, LimitRanges, and Templates

Scenario

MitziCom is starting production, and they are very concerned that they may run out of resources. In order to address these concerns, you need to set quotas and limits on the system.

MitziCom has decided to deploy Red Hat 3scale API Management in their RHOCP environment to evaluate its performance impact on the cluster. They have asked you to create a template to deploy 3scale API Management in a repeatable manner, taking into account its resource requirements. You need to edit the template that deploys 3scale API Management in order for users to use it be able to deploy it with enough resources and appropriate limits to function properly.

Goals

- Create quotas for the cluster
- Import the 3scale AMP template to set up 3scale API Management
- Deploy the system
- Edit the template to launch 3scale properly

1. Create Quotas for Cluster

1. Switch to the **system:admin** user to set a quota on **andrew**:

oc login -u system:admin

2. Create a limited cluster resource quota that sets the following hard limits:

pods=25 requests.memory=6Gi requests.cpu=5 limits.cpu=25 limits.memory=40Gi configmaps=25 persistentvolumeclaims=25 services=25 project-annotation-selector for the andrew user 3. View the cluster resource quota: oc get clusterresourcequota Sample Output NAME LABEL SELECTOR ANNOTATION SELECTOR clusterquota-andrew map[openshift.io/requester:andrew] <none> 4. Describe the cluster resource quota. Note that you wont have any values shown yet, because the requester has no projects yet. oc describe clusterresourcequota clusterquota-andrew Sample Output clusterquota-andrew Name: 18 seconds ago Created: Labels: <none> Annotations: <none> Namespace Selector: [] Label Selector: AnnotationSelector: map[openshift.io/requester:andrew] Resource Used Hard



For some reason the oc describe command does not display the actual resources.

To see that you created the clusterresourcequota correctly use oc get clusterresourcequota clusterquota-andrew -o yaml.

2. Download 3scale Templates from Internet

1. Get the 3scale AMP template:

wget https://raw.githubusercontent.com/3scale/3scale-amp-openshifttemplates/2.1.0-GA/amp/amp.yml

3. Deploy 3scale System

3.1. Import 3scale AMP Template

1. Switch to the andrew user:

oc login -u andrew -p r3dh4t1!

2. Create a new project for 3scale API Management:

oc new-project 3scale

3. Create the 3scale AMP template and, optionally, the APIcast template:

oc create -f amp.yml
oc get template

Sample Output:

NAME DESCRIPTION PARAMETERS OBJECTS system 23 (1 blank) 49

4. Create a 3scale Admin Portal with oc new-app:

```
oc new-app --template=system --param
WILDCARD DOMAIN=apps.cluster-$GUID.$GUID.ocp4.opentlc.com
```

Sample Output

[...]
 deploymentconfig.apps.openshift.io "zync-database" created
--> Success
 Access your application via route '3scale-admin.apps.clusterede2.ede2.ocp4.opentlc.com'
 Access your application via route 'backend-3scale.apps.clusterede2.ede2.ocp4.opentlc.com'
 Access your application via route '3scale.apps.clusterede2.ede2.ocp4.opentlc.com'
 Access your application via route 'api-3scale-apicaststaging.apps.cluster-ede2.ede2.ocp4.opentlc.com'
 Access your application via route 'api-3scale-apicastproduction.apps.cluster-ede2.ede2.ocp4.opentlc.com'
 Access your application via route 'api-ascale-apicastproduction.apps.cluster-ede2.ede2.ocp4.opentlc.com'
 Access your application via route 'apicast-wildcard.apps.cluster-

Run 'oc status' to view your app.

5. Verify that no pods were launched:

ede2.ede2.ocp4.opentlc.com'

oc get pods -n 3scale

Sample Output

No resources found.

6. Find out why:

oc get events | grep clusterquota

Sample Output

10s Warning FailedCreate DeploymentConfig Error cr
1s Warning FailedCreate DeploymentConfig Error cr
[...]



failed quota: ... must specify limits.etc, etc. means that we forgot to deploy a LimitRange. Try again by redeploying, this time setting the LimitRange.

4. Redeploy 3scale With a Limit Range

1. Delete the 3scale project to easily start over

```
oc delete project 3scale
```

2. Create the Project Again

```
oc new-project 3scale
```

- 3. Create a file called | limits.yaml | with a LimitRange
- 4. Deploy a limit range to specify limits on all objects in the 3scale project.

```
oc login -u system:admin oc create -f ./limits.yaml
```

5. Create the template and deploy the template again:

```
oc login -u andrew -p r3dh4t1!
oc create -f ./amp.yml
oc new-app --template=system --param
WILDCARD_DOMAIN=apps.cluster-$GUID.$GUID.ocp4.opentlc.com
```



Now you will encounter a new error. The Quota will not complain about "no limits set". Rather, deploying a template with ten deployments of one pod exceeds your pod quota. Why?

1. Have a look at the ClusterResourceQuotas that are applied in the current context

oc describe AppliedClusterResourceQuota

Sample Output

Name: clusterquota-andrew

Created: 4 minutes ago

Labels: <none>
Annotations: <none>

Namespace Selector: ["3scale"]

Label Selector:

AnnotationSelector: map[openshift.io/requester:andrew]

Used Resource Hard ----configmaps 2 25 limits.cpu 1250m 25 limits.memory 2500Mi 40Gi persistentvolumeclaims 4 25 pods 25 25 requests.cpu 1250m 5 requests.memory 2500Mi 6Gi services 25 10

2. Find out why all 10 pods aren't deploying correctly:

oc get events

Sample Output

[]				
2m33s	Warning	FailedCreate	ReplicationController	Error
2m33s	Warning	FailedCreate	ReplicationController	Error
2m33s	Warning	FailedCreate	ReplicationController	Error
[]				



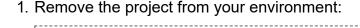
Examine resource utilization of all the pods with oc adm top pod. Note however that this command currently does not work in OpenShift 4 (0.13).

3. Edit the container requests and limits in your template to restrict CPU and RAM for the system-app pod and the other containers in the template so they start reliably.



You can experiment with settings by using oc edit dc for the various deploymentconfigs for pods that are failing to deploy. Note also the livenessProbe and readinessProbe timeouts, you may need to extend them.

5. Clean Up Environment



```
oc login -u system:admin oc delete project 3scale
```

2. Confirm that you still have cluster quotas in your system:

oc get clusterresourcequota

3. Optionally, remove the cluster quota:

oc delete clusterresourcequota clusterquota-andrew

This completes the 3scale API Management lab.

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