



Exercise 4.3: Resource Limits for a Namespace

The previous steps set limits for that particular deployment. You can also set limits on an entire namespace. We will create a new namespace and configure another `hog` deployment to run within. When set `hog` should not be able to use the previous amount of resources.

1. Begin by creating a new namespace called `low-usage-limit` and verify it exists.

```
student@cp:~$ kubectl create namespace low-usage-limit
```

```
1 namespace/low-usage-limit created
```

```
student@cp:~$ kubectl get namespace
```

```
1 NAME                STATUS    AGE
2 default              Active    1h
3 kube-node-lease      Active    1h
4 kube-public          Active    1h
5 kube-system          Active    1h
6 low-usage-limit      Active    42s
```

2. Create a YAML file which limits CPU and memory usage. The kind to use is `LimitRange`. Remember the file may be found in the example tarball.

```
student@cp:~$ vim low-resource-range.yaml
```

YAML

low-resource-range.yaml

```
1 apiVersion: v1
2 kind: LimitRange
3 metadata:
4   name: low-resource-range
5 spec:
6   limits:
7   - default:
8       cpu: 1
9       memory: 500Mi
10  defaultRequest:
11    cpu: 0.5
12    memory: 100Mi
13  type: Container
```

3. Create the `LimitRange` object and assign it to the newly created namespace `low-usage-limit`. You can use `--namespace` or `-n` to declare the namespace.

```
student@cp:~$ kubectl --namespace=low-usage-limit \
  create -f low-resource-range.yaml
```

```
1 limitrange/low-resource-range created
```

4. Verify it works. Remember that every command needs a namespace and context to work. Defaults are used if not provided.

```
student@cp:~$ kubectl get LimitRange
```

```
1 No resources found in default namespace.
```

```
student@cp:~$ kubectl get LimitRange --all-namespaces
```

```
1 NAMESPACE      NAME                CREATED AT
2 low-usage-limit low-resource-range  2019-01-08T17:54:22
```

5. Create a new deployment in the namespace.

```
student@cp:~$ kubectl -n low-usage-limit \
  create deployment limited-hog --image vish/stress
```

```
1 deployment.apps/limited-hog created
```

6. List the current deployments. Note `hog` continues to run in the default namespace. If you chose to use the **Calico** network policy you may see a couple more than what is listed below.

```
student@cp:~$ kubectl get deployments --all-namespaces
```

```
1 NAMESPACE      NAME                READY  UP-TO-DATE  AVAILABLE  AGE
2 default        hog                 1/1    1           1          7m57s
3 kube-system    calico-kube-controllers 1/1    1           1          2d10h
4 kube-system    coredns             2/2    2           2          2d10h
5 low-usage-limit limited-hog          0/1    0           0          9s
```

7. View all pods within the namespace. Remember you can use the **tab** key to complete the namespace. You may want to type the namespace first so that tab-completion is appropriate to that namespace instead of the default namespace.

```
student@cp:~$ kubectl -n low-usage-limit get pods
```

```
1 NAME                                READY  STATUS   RESTARTS  AGE
2 limited-hog-2556092078-wnpnv        1/1    Running  0          2m11s
```

8. Look at the details of the pod. You will note it has the settings inherited from the entire namespace. The use of shell completion should work if you declare the namespace first.

```
student@lfs459-node-1a0a:~$ kubectl -n low-usage-limit \
  get pod limited-hog-2556092078-wnpnv -o yaml
```

```
1 <output_omitted>
2 spec:
3   containers:
4   - image: vish/stress
5     imagePullPolicy: Always
6     name: stress
7     resources:
8       limits:
9         cpu: "1"
10        memory: 500Mi
11       requests:
12         cpu: 500m
13         memory: 100Mi
14     terminationMessagePath: /dev/termination-log
15 <output_omitted>
```

9. Copy and edit the config file for the original `hog` file. Add the namespace: line so that a new deployment would be in the `low-usage-limit` namespace. Delete the `selflink` line.

```
student@cp:~$ cp hog.yaml hog2.yaml
```

```
student@cp:~$ vim hog2.yaml
```



hog2.yaml

```

1 ....
2   labels:
3     app: hog
4     name: hog
5     namespace: low-usage-limit      #<<--- Add this line, delete following
6     selfLink: /apis/apps/v1/namespaces/default/deployments/hog
7   spec:
8     ....

```

10. Open up extra terminal sessions so you can have **top** running in each. When the new deployment is created it will probably be scheduled on the node not yet under any stress.

Create the deployment.

```
student@cp:~$ kubectl create -f hog2.yaml
```

```
1 deployment.apps/hog created
```

11. View the deployments. Note there are two with the same name, **hog** but in different namespaces. You may also find the **calico-typha** deployment has no pods, nor has any requested. Our small cluster does not need to add **Calico** pods via this autoscaler.

```
student@cp:~$ kubectl get deployments --all-namespaces
```

1	NAMESPACE	NAME	READY	UP-TO-DATE	AVAILABLE	AGE
2	default	hog	1/1	1	1	24m
3	kube-system	calico-kube-controllers	1/1	0	0	4h
4	kube-system	coredns	2/2	2	2	4h
5	low-usage-limit	hog	1/1	1	1	26s
6	low-usage-limit	limited-hog	1/1	1	1	5m11s

12. Look at the **top** output running in other terminals. You should find that both **hog** deployments are using about the same amount of resources, once the memory is fully allocated. Per-deployment settings override the global namespace settings. You should see something like the following lines one from each node, which indicates use of one processor and about 12 percent of your memory, were you on a system with 8G total.

```

1 25128 root    20   0 958532 954672   3180 R 100.0 11.7   0:52.27 stress
2 24875 root    20   0 958532 954800   3180 R 100.3 11.7  41:04.97 stress

```

13. Delete the **hog** deployments to recover system resources.

```
student@cp:~$ kubectl -n low-usage-limit delete deployment hog
```

```
1 deployment.apps "hog" deleted
```

```
student@cp:~$ kubectl delete deployment hog
```

```
1 deployment.apps "hog" deleted
```