OpenShift Quota

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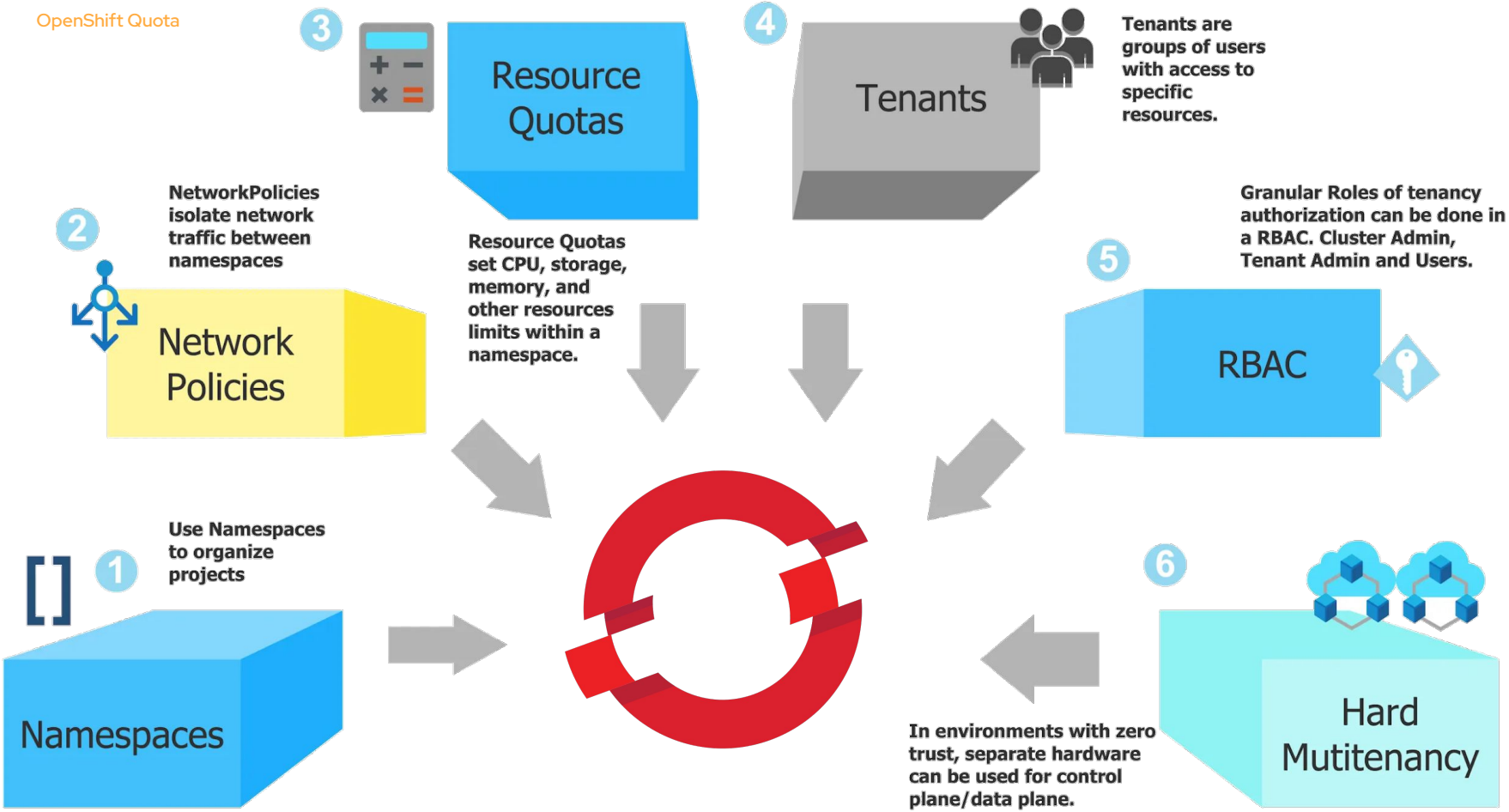
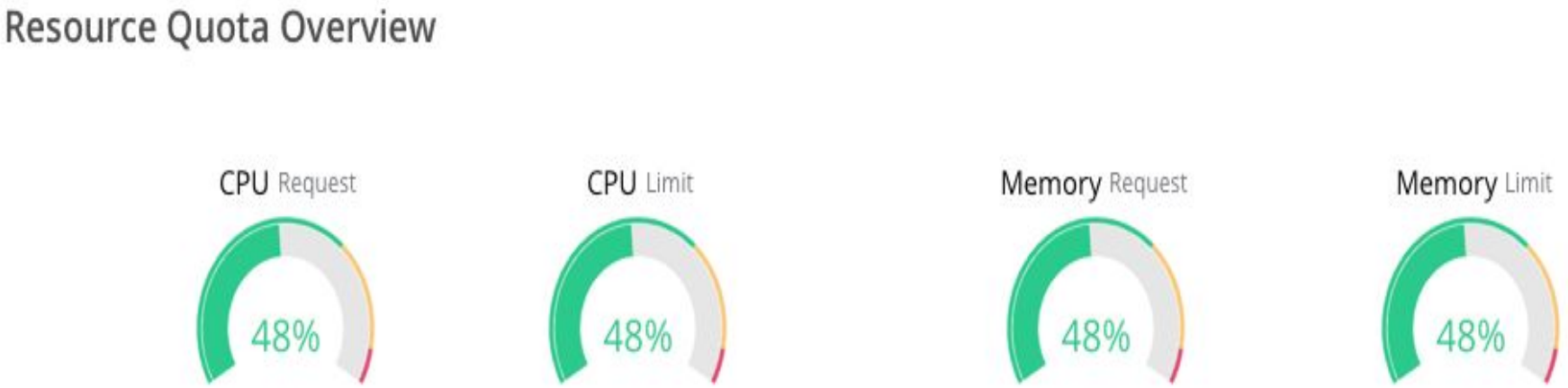

3
Resource Quotas
4
Tenants
Tenants are groups of users with access to specific resources.
2
NetworkPolicies isolate network traffic between namespaces
Network Policies
Resource Quotas set CPU, storage, memory, and other resources limits within a namespace.
5
Granular Roles of tenancy authorization can be done in a RBAC. Cluster Admin, Tenant Admin and Users.
RBAC
1
Use Namespaces to organize projects
Namespaces
6
Hard Mutitenancy
In environments with zero trust, separate hardware can be used for control plane/data plane.

Definitions of quota

A *resource quota*, defined by a ResourceQuota object, provides constraints that limit aggregate resource consumption per project

Quota In OpenShift



How does Quota Helps

2 Types of Quota

Resource quotas per project

Resource quotas across multiple projects

Resources managed by quotas

CPU/request.cpu	The sum of CPU requests across all pods in a non-terminal state cannot exceed this value. cpu and requests.cpu are the same value and can be used interchangeably.
memory/request.memory	The sum of memory requests across all pods in a non-terminal state cannot exceed this value. memory and requests.memory are the same value and can be used interchangeably.
ephemeral storage/request.ephemeral storage	The sum of local ephemeral storage requests across all pods in a non-terminal state cannot exceed this value. ephemeral-storage and requests.ephemeral-storage are the same value and can be used interchangeably. This resource is available only if you enabled the ephemeral storage technology preview. This feature is disabled by default.

Resources managed by quotas..continue

limits.cpu	The sum of CPU limits across all pods in a non-terminal state cannot exceed this value.
limits.memory	The sum of memory limits across all pods in a non-terminal state cannot exceed this value.
limits.ephemeral storage	The sum of ephemeral storage limits across all pods in a non-terminal state cannot exceed this value. This resource is available only if you enabled the ephemeral storage technology preview. This feature is disabled by default.

Storage resources managed by quota

Resource Name	Description
requests.storage	The sum of storage requests across all persistent volume claims in any state cannot exceed this value.
persistentvolumeclaims	The total number of persistent volume claims that can exist in the project.
<storage-class-name>.storageclass.storage.k8s.io/requests.storage	The sum of storage requests across all persistent volume claims in any state that have a matching storage class, cannot exceed this value.
<storage-class-name>.storageclass.storage.k8s.io/persistentvolumeclaims	The total number of persistent volume claims with a matching storage class that can exist in the project.

Object counts managed by quota

Resource Name	Description
pods	The total number of pods in a non-terminal state that can exist in the project.
replicationcontrollers	The total number of ReplicationControllers that can exist in the project.
resourcequotas	The total number of resource quotas that can exist in the project.
services	The total number of services that can exist in the project.
services.loadbalancers	The total number of services of type LoadBalancer that can exist in the project.
services.nodeports	The total number of services of type NodePort that can exist in the project.
secrets	The total number of secrets that can exist in the project.
configmaps	The total number of ConfigMap objects that can exist in the project.
persistentvolumeclaims	The total number of persistent volume claims that can exist in the project.
openshift.io/imagestreams	The total number of imagestreams that can exist in the project.

Sample Quota

```
apiVersion: v1
kind: ResourceQuota
metadata:
  name: core-object-counts
spec:
  hard:
    memory: "1Gi"
    cpu: "20"
    pods: "10"
    persistentvolumeclaims: "4"
    replicationcontrollers: "20"
    secrets: "10"
    services: "10"
```

View Quotas

```
$ oc get quota
NAME                 AGE
core-object-counts   29m
memory-quotas        29m
```

Restrict resource consumption with limit ranges

A limit range, defined by a LimitRange object, restricts resource consumption in a project. In the project you can set specific resource limits for a pod, container, image, image stream, or persistent volume claim (PVC).

Requests and Limits

```yaml
apiVersion: v1
kind: Pod
spec:
  containers:
  - image: nginx
    name: nginx
    resources:
      requests:
        cpu: 100m (1)
        memory: 200Mi (2)
      limits:
        cpu: 200m (3)
        memory: 400Mi (4)
```

(1) The container requests 100m cpu.

(2) The container requests 200Mi memory.

(3) The container limits 200m cpu.

(4) The container limits 400Mi memory.

Quota summary

Setting Quotas: https://docs.openshift.com/container-platform/4.6/applications/quotas/quotas-setting-per-project.html

Setting Multi-Project Quotas: https://docs.openshift.com/container-platform/4.6/applications/quotas/quotas-setting-across-multiple-projects.html

Setting Limit Ranges: https://docs.openshift.com/container-platform/4.6/nodes/clusters/nodes-cluster-limit-ranges.html

Begin Exercise 4