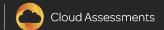


# Certified Kubernetes Administrator Prep

**API Primitives & Cluster Architecture** 

## API Primitives

- Persistent entities in the Kubernetes System.
- Uses these to represent state of the cluster.
- Describe:
  - What applications are running.
  - Which nodes those applications are running on.
  - Policies around those applications.
- Kubernetes Objects are "records of intent."





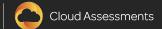
## **API Primitives**

## Object Spec:

- Provided to Kubernetes.
- Describes desired state of objects.

## Object Status:

- Provided by Kubernetes.
- Describes the actual state of the object.





## **Kubernetes Yaml**

```
apiVersion: v1
kind: Pod
metadata:
  name: busybox
spec:
  containers:
  - name: busybox
    image: busybox
    command:
      - sleep
      - "3600"
```

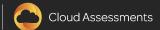






# Common Kubernetes Objects

- Nodes
- Pods
- Deployments
- Services
- ConfigMaps





### Names and UIDs

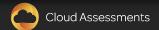
#### Names

- All objects have a unique name.
- Client provided.
- Can be reused.
- Maximum length of 253 characters.
- Lower case alphanumeric characters.
- and . allowed

#### UIDs

- All objects have a unique UID.
- Generated by Kubernetes.
- Spatially and temporally unique.

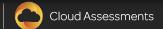






# Namespaces

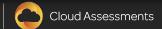
- Multiple virtual clusters back by the same virtual cluster.
- Generally for large deployments.
- Provide scope for names.
- Easy way to divide cluster resources.
- Allows for multiple teams of users.
- Allows for resource quotas.
- Special "kube-system" namespace.
  - Used to differentiate system pods from user pods.





## Nodes

- Might be a VM or physical machine.
- Services necessary to run pods.
- Managed by the master.
- Services necessary:
  - Container runtime
  - Kubelet
  - Kube-proxy
- Not inherently created by Kubernetes, but by the Cloud Provider.
- Kubernetes checks the node for validity.





# **Cloud Controller Managers**

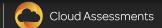
- Route controller (gce clusters only)
- Service Controller
- PersistentVolumeLabels controller





## Node Controller

- Assigns CIDR block to a newly registered node.
- Keeps track of the nodes.
- Monitors the node health.
- Evicts pods from unhealthy nodes.
- Can taint nodes based on current conditions in more recent versions.





# Conclusion

- API Primitives (Kubernetes Objects)
  - How to interact with them
  - How to describe them
  - What they are
- Cluster Architecture



