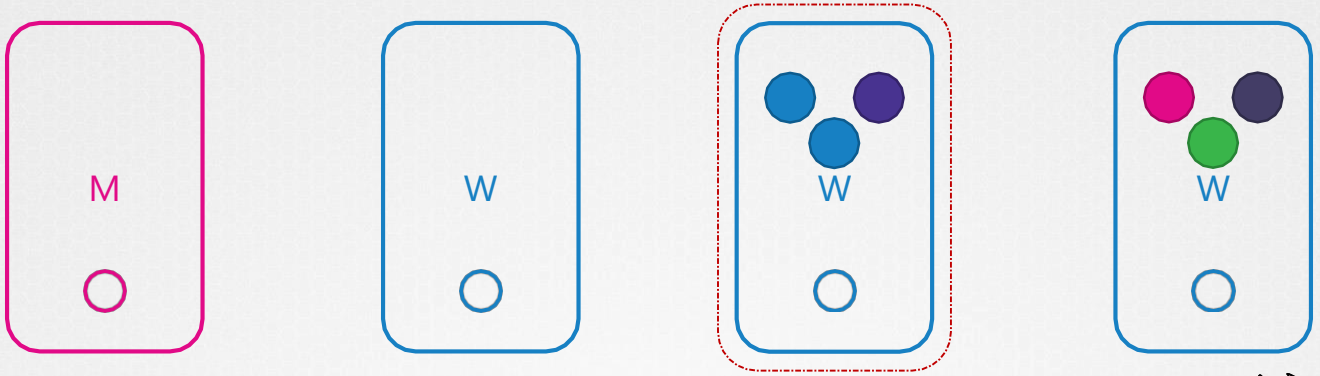
Operating System Upgrade




```
kubectl drain node-1
```

→ Evict all Pods, and mark as "unschedulable" → Set taint

node.kubernetes.io/unschedulable

```
kubectl cordon node-2
```

→ mark as "unschedulable"

```
kubectl uncordon node-1
```

→ mark as "schedulable"

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Cluster Upgrade Process

kube-apiserver

X v1.10

Controller-manager

X-1
v1.9 or v1.10

kube-scheduler

X-1
v.19 or v1.10

kubectl

X+1 > X-1

kubelet

X-2
v1.8 or v1.9 or v.110

kube-proxy

X-2
V1.8 or v1.9 or v1.10

Easiest

kubeadm

"The hard way"

standard-cluster-1

Details Storage Nodes

Cluster

Master version	1.10.12-gke.7	Upgrade available
Endpoint	35.238.15.143	Show credentials
Client certificate	Enabled	
Binary authorisation	Disabled	
Kubernetes alpha features	Disabled	
Total size	3	
Master zone	us-central1-a	
Node zones	us-central1-a	
Network	default	

```
kubeadm upgrade plan
```

```
kubeadm upgrade apply
```

→ Drain Node
→ Upgrade
→ Uncordon

kubeadm - upgrade

kubeadm upgrade plan

```
[preflight] Running pre-flight checks.
[upgrade] Making sure the cluster is healthy:
[upgrade/config] Making sure the configuration is correct:
[upgrade] Fetching available versions to upgrade to
[upgrade/versions] Cluster version: v1.11.8
[upgrade/versions] kubeadm version: v1.11.3
[upgrade/versions] Latest stable version: v1.13.4
[upgrade/versions] Latest version in the v1.11 series: v1.11.8

Components that must be upgraded manually after you have
upgraded the control plane with 'kubeadm upgrade apply':
COMPONENT CURRENT  AVAILABLE
Kubelet     3 x v1.11.3   v1.13.4

Upgrade to the latest stable version:

COMPONENT            CURRENT   AVAILABLE
API Server           v1.11.8   v1.13.4
Controller  Manager   v1.11.8   v1.13.4
Scheduler            v1.11.8   v1.13.4
Kube Proxy           v1.11.8   v1.13.4
CoreDNS              1.1.3     1.1.3
Etcd                 3.2.18    N/A

You can now apply the upgrade by executing the following command:
```

kubeadm - upgrade


```
apt-get upgrade -y kubeadm=1.12.0-00
```

```
kubeadm upgrade apply v1.12.0
```

```
…

[upgrade/successful] SUCCESS! Your cluster was upgraded to "v1.12.0". Enjoy!

[upgrade/kubelet] Now that your control plane is upgraded, please proceed with
upgrading your kubelets if you haven't already done so.
```

```
kubectl get nodes
```

```
NAME      STATUS    ROLES     AGE       VERSION
master   Ready   masternode-    1d        v1.11.3
1    Ready    <none> node-2    1d        v1.11.3
Ready   <none>                 1d        v1.11.3
```

```
apt-get upgrade -y kubelet=1.12.0-00
```

```
systemctl restart kubelet
```

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Backup and Restore

Backup Candidates

Resource Configuration

ETCD Cluster

Persistent Volumes

Backup – Resource Configs

kube-apiserver

Resource Configuration

```
kubectl get all --all-namespaces -o yaml > all-deploy-services.yaml
```

Formerly called ARK by HeptIO

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Backup - ETCD

ETCD Cluster

etcd.service

```
ExecStart=/usr/local/bin/etcd \\
  --name ${ETCD_NAME} \\
  --cert-file=/etc/etcd/kubernetes.pem \\
  --key-file=/etc/etcd/kubernetes-key.pem \\
  --peer-cert-file=/etc/etcd/kubernetes.pem \\
  --peer-key-file=/etc/etcd/kubernetes-key.pem \\
  --trusted-ca-file=/etc/etcd/ca.pem \\
  --peer-trusted-ca-file=/etc/etcd/ca.pem \\
  --peer-client-cert-auth \\
  --client-cert-auth \\
  --initial-advertise-peer-urls https://${INTERNAL_IP}:
  --listen-peer-urls https://${INTERNAL_IP}:2380 \\
  --listen-client-urls https://${INTERNAL_IP}:2379,http
  --advertise-client-urls https://${INTERNAL_IP}:2379 \
  --initial-cluster-token etcd-cluster-0 \\
  --initial-cluster controller-0=https://${CONTROLLER0_
  --initial-cluster-state new \\
  --data-dir=/var/lib/etcd
```

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Backup - ETCD

ETCD Cluster


```
ETCDCTL_API=3 etcdctl \
    snapshot save snapshot.db
```

```
ls
snapshot.db
```

```
ETCDCTL_API=3 etcdctl \
    snapshot status snapshot.db
+----------+----------+------------+------------+
|   HASH   | REVISION | TOTAL KEYS | TOTAL SIZE |
+----------+----------+------------+------------+
| e63b3fc5 |   473353 |        875 |     4.1 MB |
+----------+----------+------------+------------+
```

Restore - ETCD

ETCD Cluster

```
ETCDCTL_API=3 etcdctl \
    snapshot save snapshot.db
```

```
ls
snapshot.db
```

```
service kube-apiserver stop
Service kube-apiserver stopped
```

```
ETCDCTL_API=3 etcdctl \
   snapshot restore snapshot.db \
   --data-dir /var/lib/etcd-from-backup \
   --initial-cluster master-
1=https://192.168.5.11:2380,master-
2=https://192.168.5.12:2380 \
   --initial-cluster-token etcd-cluster-1 \
   --initial-advertise-peer-urls
https://${INTERNAL_IP}:2380
```

```
I | mvcc: restore compact to 475629
I | etcdserver/membership: added member 5e89ccdfe3
[https://192.168.5.12:2380] to cluster 894c7131f5165a78
I | etcdserver/membership: added member c8246cee7c
[https://192.168.5.11:2380] to cluster 894c7131f5165a78
```

```
systemctl daemon-reload
```

```
service etcd restart
Service etcd restarted
```

After restore update /etc/systemd/system/etcd.service

etcd.service

```
ExecStart=/usr/local/bin/etcd \\
  --name ${ETCD_NAME} \\
  --cert-file=/etc/etcd/kubernetes.pem \\
  --key-file=/etc/etcd/kubernetes-key.pem \\
  --peer-cert-file=/etc/etcd/kubernetes.pem \\
  --peer-key-file=/etc/etcd/kubernetes-key.pem \\
  --trusted-ca-file=/etc/etcd/ca.pem \\
  --peer-trusted-ca-file=/etc/etcd/ca.pem \\
  --peer-client-cert-auth \\
  --client-cert-auth \\
  --initial-advertise-peer-urls https://${INTERNAL_
  --listen-peer-urls https://${INTERNAL_IP}:2380 \\
  --listen-client-urls https://${INTERNAL_IP}:2379,
  --advertise-client-urls https://${INTERNAL_IP}:23
  --initial-cluster-token etcd-cluster-1    \
  --initial-cluster controller-0=https://${CONTROLL
  --initial-cluster-state new \\
  --data-dir=/var/lib/etcd-from-backup
```