TEL4VN

Managing the k8s cluster

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- OS upgrades within a cluster
- Backing up and restoring a cluster

Upgrading the k8s cluster

Upgrading kubeadm-based Clusters

- Only upgrade minor versions.
- Cannot support minor + 2 version upgrade.

Upgrading kubeadm-based Clusters

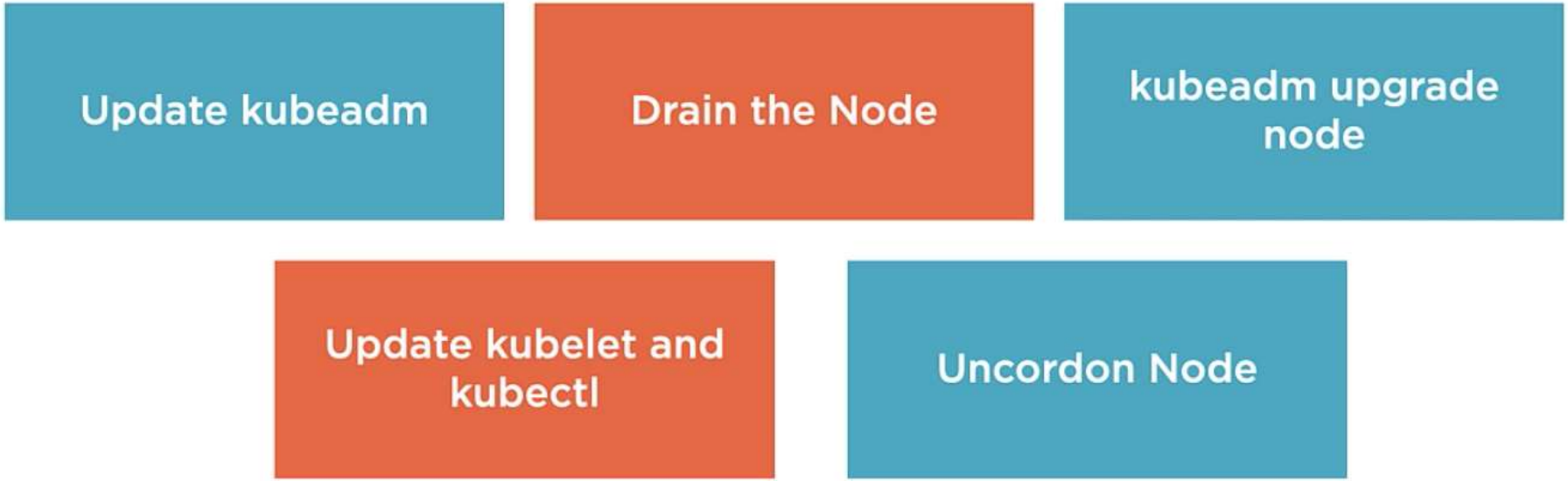
- Checking the release notes
  https://github.com/kubernetes/kubernetes/releases

Bug or Regression

- Azure: set dest prefix and port for IPv6 inbound security rule (#91831, @aramase) [SIG Cloud Provider]
- Fix public IP not shown issues after assigning public IP to Azure VMs (#90886, @feiskyer) [SIG Cloud Provider]
- Fixed a regression preventing garbage collection of RBAC role and binding objects (#90534, @apelisse) [SIG Auth]
- Fixes regression in CPUManager that caused freeing of exclusive CPUs at incorrect times (#90377, @cbf123) [SIG Cloud Provider and Node]
- Fixes regression in CPUManager that had the (rare) possibility to release exclusive CPUs in app containers inherited from init containers. (#90419, @klueska) [SIG Node]
- Pod Finalizers and Conditions updates are skipped for re-scheduling attempts (#91298, @alculquicondor) [SIG Scheduling]
- Resolve regression in metadata.managedFields handling in create/update/patch requests not using server-side apply (#91791, @apelisse) [SIG API Machinery and Testing]
- Resolves an issue using `kubectl certificate approve/deny` against a server serving the v1 CSR API (#91691, @liggitt) [SIG Auth and CLI]

Cluster Upgrade Process – Master Nodes

Cluster Upgrade Process - Worker Nodes



Command Reference

```
# get the version of the api server
kubectl version --short

# view the version of kubelet
kubectl describe nodes

# view the version of controller-manager pod
kubectl get po [controller_pod_name] -o yaml -n kube-system

# release the hold on versions of kubeadm and kubelet
sudo apt-mark unhold kubeadm kubelet

# install version 1.16.6 of kubeadm
sudo apt install -y kubeadm=1.16.6-00

# hold the version of kubeadm at 1.16.6
sudo apt-mark hold kubeadm
```

Control node upgrade

```
# verify the version of
kubeadm version

# plan the upgrade of all the controller components
sudo kubeadm upgrade plan

# upgrade the controller components
sudo kubeadm upgrade apply v1.16.6

# release the hold on the version of kubectl
sudo apt-mark unhold kubectl

# upgrade kubectl
sudo apt-install -y kubectl=1.16.6-00

# hold the version of kubectl at 1.16.6
sudo apt-mark hold kubectl

# Upgrade kubelet to 1.16.6
sudo apt install -y kubelet=1.16.6-00

# hold the version of kubelet at 1.16.6
```

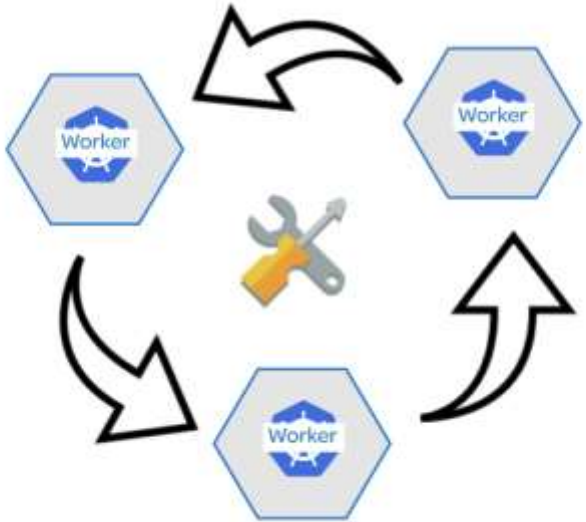
Worker upgrade

```
# verify the version of
kubeadm version

# plan the upgrade of all the controller components
sudo kubeadm upgrade node

# release the hold on the version of kubectl
sudo apt-mark unhold kubectl

# upgrade kubectl
sudo apt-install -y kubectl=1.16.6-00

# hold the version of kubectl at 1.16.6
sudo apt-mark hold kubectl

# Upgrade kubelet to 1.16.6
sudo apt install -y kubelet=1.16.6-00

# hold the version of kubelet at 1.16.6
sudo apt-mark hold kubelet
```

OS upgrades within a cluster

Node Maintenance

Due to the pod eviction timeout set by the controller manager, pods are terminated after five minutes by default, unless you are using ReplicaSets.



Command Reference

```
# Evict the pods on node
kubectl drain [node_name] --ignore-daemonsets

# Schedule pods on node
kubectl uncordon [node_name]

# List the current tokens for add new node on cluster
kubeadm token list

# Get new token to join
kubeadm token generate

# Print the kubeadm join command
kubeadm token create <token_name> --ttl 23h --print-join-command
```

Backup the cluster

- Backup the resource config

```
Kubectl get all --all-namespace -o yaml > all-deploy-services.yaml
```

- Backup the ETCD service

```
etcdctl --endpoints=https://127.0.0.1:2379 --cacert=/etc/kubernetes/pki/etcd/ca.crt --cert=/etc/kubernetes/pki/etcd/server.crt
--key=/etc/kubernetes/pki/etcd/server.key snapshot save /tmp/snapshot-pre-boot.db
```

Restore the cluster

- Restore the ETCD service:

```
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
```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