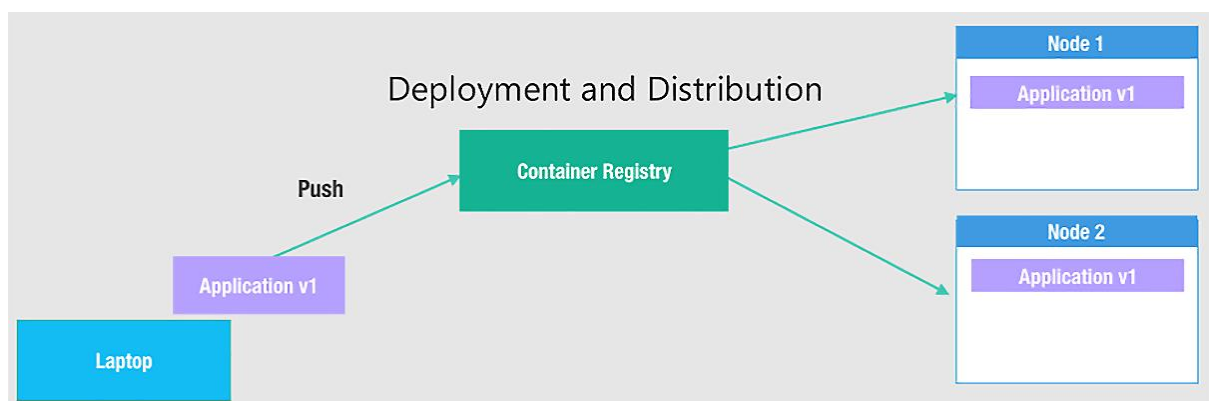
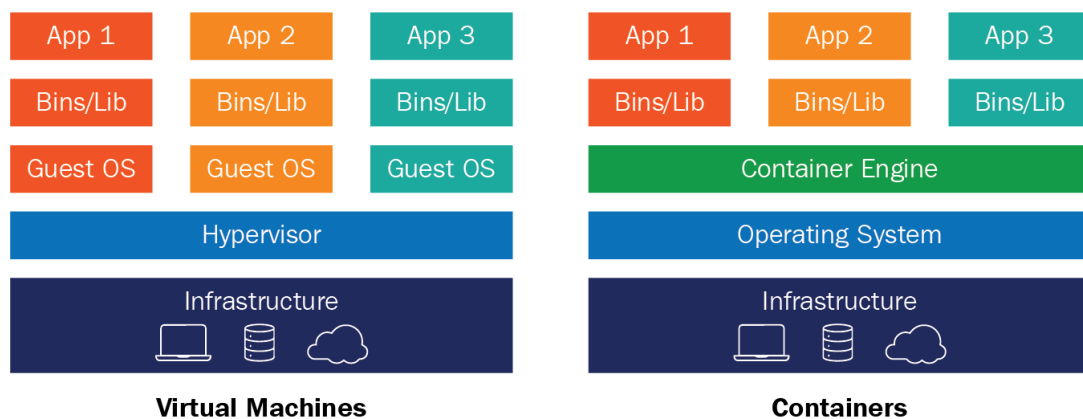
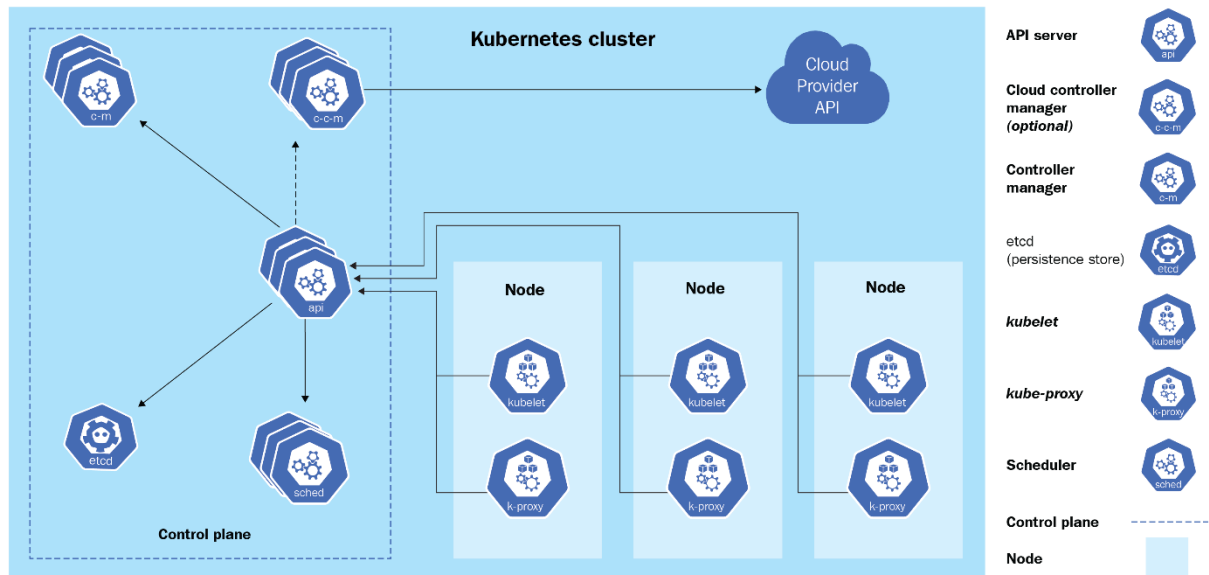
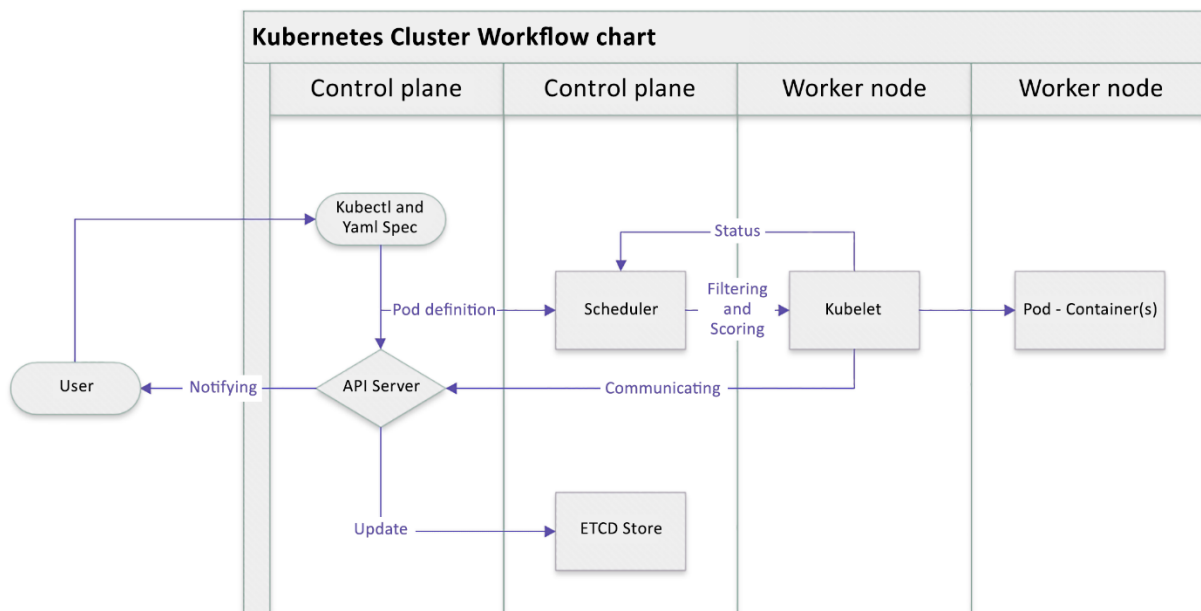
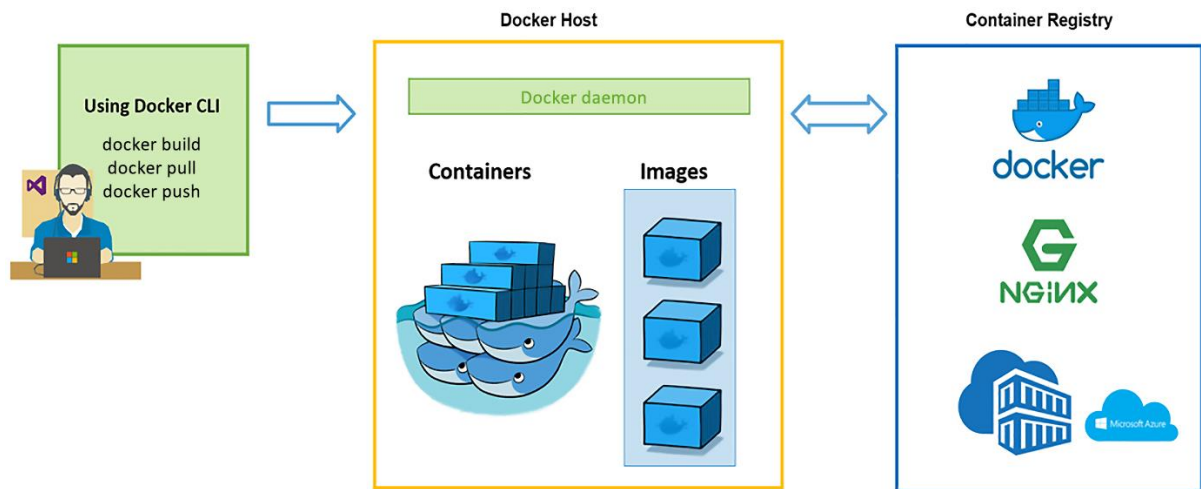
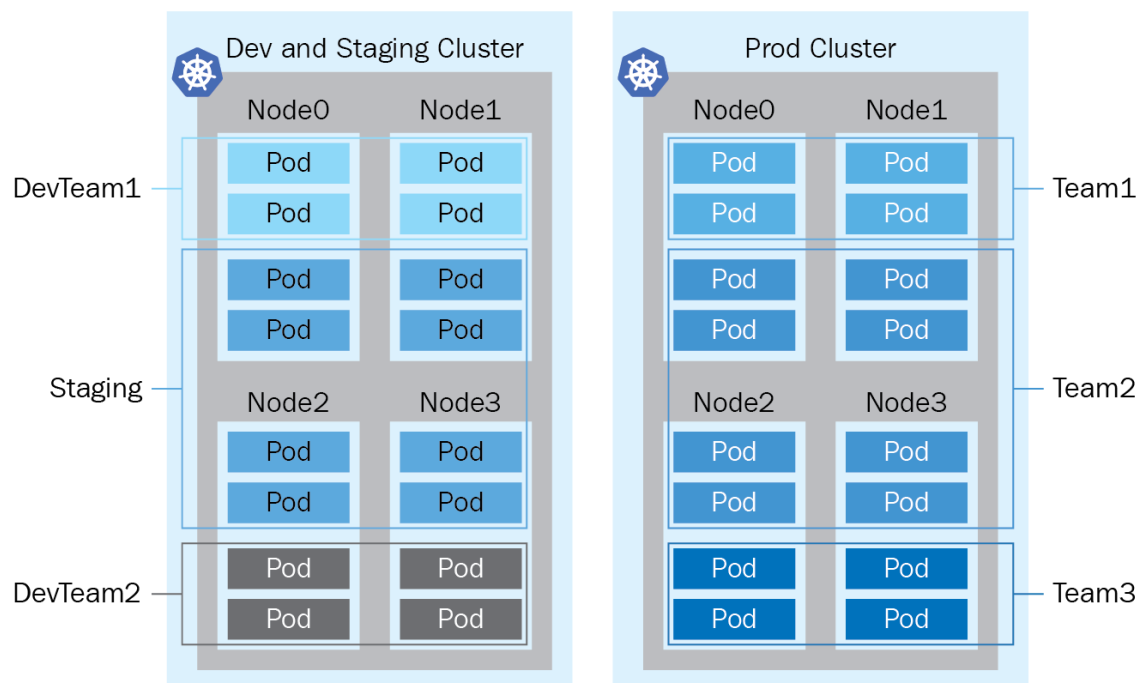
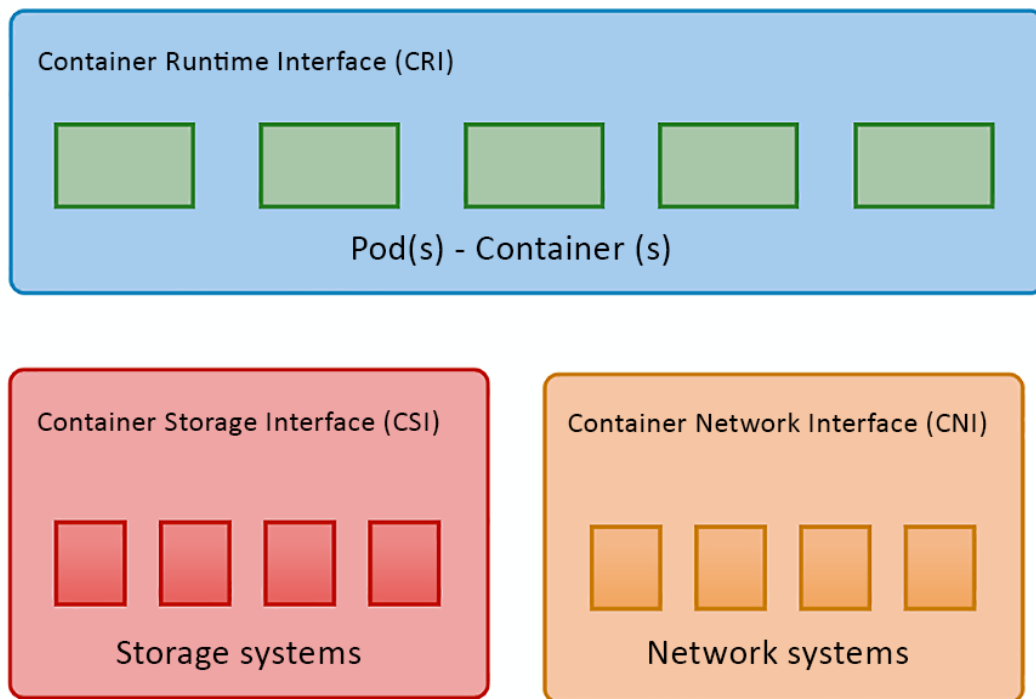


# Chapter 1: Kubernetes Overview





# Kubernetes



## Chapter 2: Installing and Configuring Kubernetes Clusters

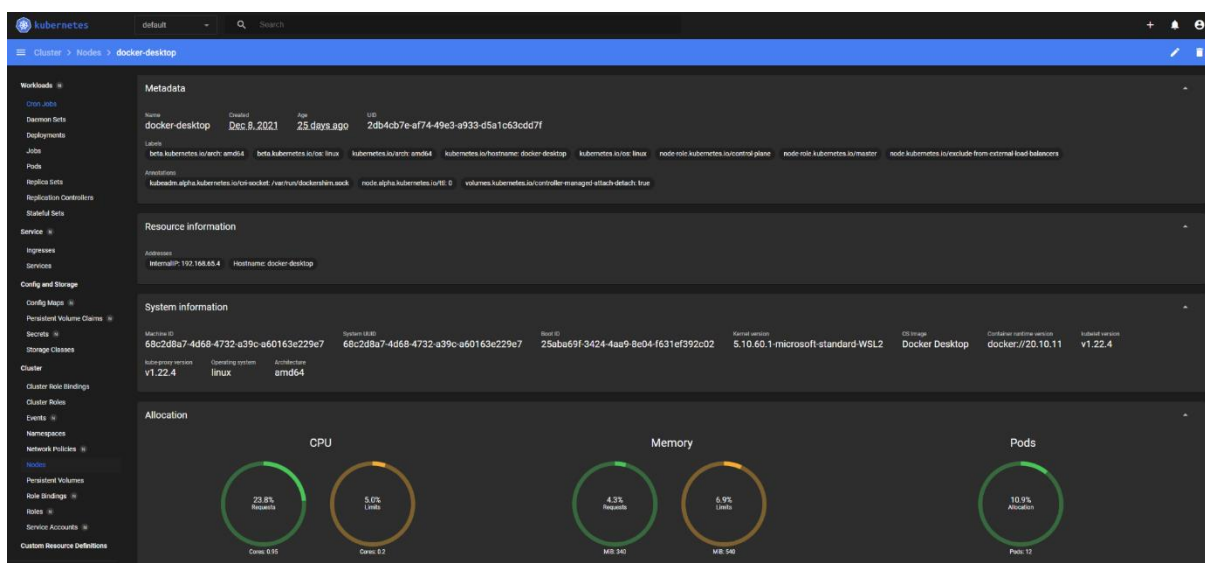
```
cloudmelon@cloudmelonsrv:~$ kubectl version --client
Client Version: version.Info{Major:"1", Minor:"23", GitVersion:"v1.23.1", GitCommit:"86ec240af8c1b60bcc4c03c20da9b98085b92e", GitTreeState:"clean", BuildDate:"2021-12-16T11:41:01Z", GoVersion:"go1.17.5", Compiler:"gc", Platform:"linux/amd64"}
```

```
cloudmelon@cloudmelonsrv:~$ sudo docker ps
[sudo] password for cloudmelon:
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS
c97ee8393f30   gcr.io/k8s-minikube/kicbase:v0.0.28  "/usr/local/bin/entr..." 25 minutes ago Up 25 minutes 127.0.0.1:49157->22/tcp, 127.0.0.1:49156->2376/tcp, 127.0.0.1:49155->5000/tcp, 127.0.0.1:49154->8443/tcp, 127.0.0.1:49153->32443/tcp  minikube
```

```
cloudmelon@cloudmelonsrv:~$ helm version
version.BuildInfo{Version:"v3.7.2", GitCommit:"663a896f4a815053445eec4153677ddc24a0a361", GitTreeState:"clean", GoVersion:"go1.16.10"}
```

```
cloudmelon@cloudmelonsrv:~$ kompose convert
INFO Kubernetes file "frontend-tcp-service.yaml" created
INFO Kubernetes file "redis-master-service.yaml" created
INFO Kubernetes file "redis-slave-service.yaml" created
INFO Kubernetes file "frontend-deployment.yaml" created
INFO Kubernetes file "redis-master-deployment.yaml" created
INFO Kubernetes file "redis-slave-deployment.yaml" created
```

```
cloudmelon@cloudmelonsrv:~$ kubectl get po -w
NAME                                READY   STATUS    RESTARTS   AGE
frontend-68b574b85d-5czxb          1/1     Running   0           17m
redis-master-d9788d6d9-sk448       1/1     Running   0           17m
redis-slave-64f6b5454f-tkvx5       1/1     Running   0           17m
```





```
cloudmelon@cm-master-vm:~$ sudo docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
--------------	-------	---------	---------	--------	-------	-------

```
containerd.sock containerd.sock.ttrpc io.containerd.runtime.v1.linux io.containerd.runtime.v2.task
```

```
cloudmelon@cloudmelonplaysrv:~$ cat <<EOF | sudo tee /etc/modules-load.d/k8s.conf
br_netfilter
EOF
```

```
cat <<EOF | sudo tee /etc/sysctl.d/k8s.conf
net.bridge.bridge-nf-call-ip6tables = 1
net.bridge.bridge-nf-call-iptables = 1
EOF
sudo sysctl --system
br_netfilter
net.bridge.bridge-nf-call-ip6tables = 1
net.bridge.bridge-nf-call-iptables = 1
* Applying /etc/sysctl.d/10-console-messages.conf ...
kernel.printk = 4 4 1 7
* Applying /etc/sysctl.d/10-ipv6-privacy.conf ...
net.ipv6.conf.all.use_tempaddr = 2
net.ipv6.conf.default.use_tempaddr = 2
* Applying /etc/sysctl.d/10-kernel-hardening.conf ...
kernel.kptr_restrict = 1
* Applying /etc/sysctl.d/10-magic-sysrq.conf ...
kernel.sysrq = 176
* Applying /etc/sysctl.d/10-network-security.conf ...
net.ipv4.conf.default.rp_filter = 2
net.ipv4.conf.all.rp_filter = 2
* Applying /etc/sysctl.d/10-ptrace.conf ...
kernel.yama.ptrace_scope = 1
* Applying /etc/sysctl.d/10-zero-page.conf ...
vm.mmap_min_addr = 32768
* Applying /usr/lib/sysctl.d/50-default.conf ...
kernel.sysrq = 16
kernel.core_uses_pid = 1
net.ipv4.conf.default.rp_filter = 2
sysctl: setting key "net.ipv4.conf.all.rp_filter": Invalid argument
net.ipv4.conf.default.accept_source_route = 0
sysctl: setting key "net.ipv4.conf.all.accept_source_route": Invalid argument
net.ipv4.conf.default.promote_secondaries = 1
sysctl: setting key "net.ipv4.conf.all.promote_secondaries": Invalid argument
net.ipv4.ping_group_range = 0 2147483647
net.core.default_qdisc = fq_codel
fs.protected_hardlinks = 1
fs.protected_symlinks = 1
fs.protected_regular = 1
fs.protected_fifos = 1
* Applying /usr/lib/sysctl.d/50-pid-max.conf ...
kernel.pid_max = 4194304
* Applying /etc/sysctl.d/99-sysctl.conf ...
* Applying /etc/sysctl.d/k8s.conf ...
net.bridge.bridge-nf-call-ip6tables = 1
net.bridge.bridge-nf-call-iptables = 1
* Applying /etc/sysctl.conf ...
```

```
cloudmelon@cm-master-vm:~$ kubectl version --client
Client Version: version.Info{Major:"1", Minor:"23", GitVersion:"v1.23.2", GitCommit:"9d424434e3f351620bfee9399e64c681af4d", GitTreeState:"clean", BuildDate:"2022-01-19T17:35:46Z", GoVersion:"go1.17.5", Compiler:"gc", Platform:"linux/amd64"}
```

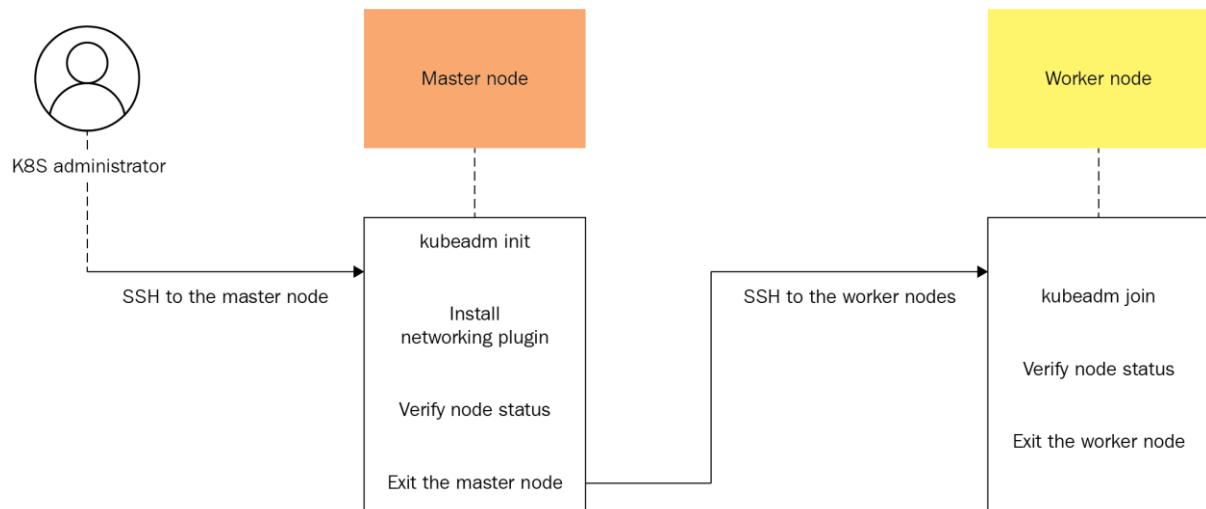
```

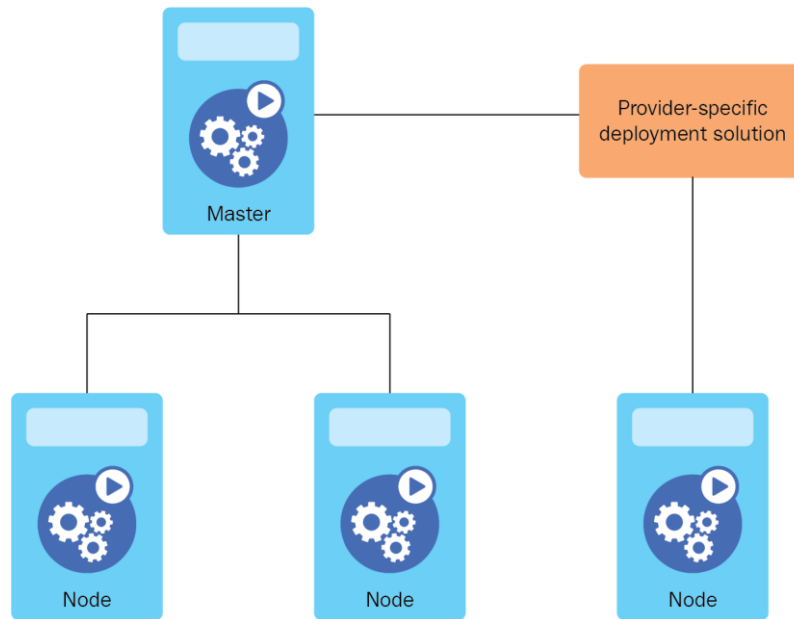
🐙 minikube v1.24.0 on Ubuntu 18.04
🔧 Using the docker driver based on user configuration
🔥 Starting control plane node minikube in cluster minikube
📡 Pulling base image ...
📦 Downloading Kubernetes v1.22.3 preload ...
> preloaded-images-k8s-v13-v1...: 501.73 MiB / 501.73 MiB 100.00% 72.40 Mi
> gcr.io/k8s-minikube/kicbase: 355.77 MiB / 355.78 MiB 100.00% 32.75 MiB p
🔥 Creating docker container (CPUs=2, Memory=2200MB) ...
📡 Preparing Kubernetes v1.22.3 on Docker 20.10.8 ...
  ▪ Generating certificates and keys ...
  ▪ Booting up control plane ...
  ▪ Configuring RBAC rules ...
📡 Verifying Kubernetes components...
  ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🔧 Enabled addons: storage-provisioner, default-storageclass
🎉 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default

```

```
cloudmelon@cloudmelonsrv:~$ kubectl get no
```

NAME	STATUS	ROLES	AGE	VERSION
minikube	Ready	control-plane,master	38s	v1.22.3





```
[cloudmelon@cloudmelonplaysrv:~]$ sudo apt-mark hold kubelet kubeadm kubectl
kubelet set on hold.
kubeadm set on hold.
kubectl set on hold.
```

```
[cloudmelon@cm-master-vm:~]$ kubeadm
```

```
KUBEADM
Easily bootstrap a secure Kubernetes cluster

Please give us feedback at:
https://github.com/kubernetes/kubeadm/issues
```

#### Example usage:

```
Create a two-machine cluster with one control-plane node
(which controls the cluster), and one worker node
(where your workloads, like Pods and Deployments run).
```

```
On the first machine:
control-plane# kubeadm init
```

```
On the second machine:
worker# kubeadm join <arguments-returned-from-init>
```

You can then repeat the second step on as many other machines as you like.

```
Usage:
kubeadm [command]
```

```
Available Commands:
certs      Commands related to handling kubernetes certificates
completion Output shell completion code for the specified shell (bash or zsh)
config     Manage configuration for a kubeadm cluster persisted in a ConfigMap in the cluster
help       Help about any command
init       Run this command in order to set up the Kubernetes control plane
join       Run this on any machine you wish to join an existing cluster
kubeconfig Kubeconfig file utilities
reset      Performs a best effort revert of changes made to this host by 'kubeadm init' or 'kubeadm join'
token      Manage bootstrap tokens
upgrade    Upgrade your cluster smoothly to a newer version with this command
version    Print the version of kubeadm
```

```
Flags:
--add-dir-header      If true, adds the file directory to the header of the log messages
-h, --help            help for kubeadm
--log-file string      If non-empty, use this log file
--log-file-max-size uint Defines the maximum size a log file can grow to. Unit is megabytes. If the value is 0, the maximum file size is unlimited. (default 1800)
--one-output           If true, only write logs to their native severity level (vs also writing to each lower severity level)
--rootfs string        [EXPERIMENTAL] The path to the 'real' host root filesystem.
--skip-headers         If true, avoid header prefixes in the log messages
--skip-log-headers     If true, avoid headers when opening log files
-v, --v Level          number for the log level verbosity
```

```
Additional help topics:
kubeadm alpha      Kubeadm experimental sub-commands
```

Use "kubeadm [command] --help" for more information about a command.

```
[cloudmelon@cm-master-vm:~$ which kubelet
/usr/bin/kubelet
```

```
[cloudmelon@cm-master-vm:~$ sudo kubeadm config images pull
[config/images] Pulled k8s.gcr.io/kube-apiserver:v1.23.2
[config/images] Pulled k8s.gcr.io/kube-controller-manager:v1.23.2
[config/images] Pulled k8s.gcr.io/kube-scheduler:v1.23.2
[config/images] Pulled k8s.gcr.io/kube-proxy:v1.23.2
[config/images] Pulled k8s.gcr.io/pause:3.6
[config/images] Pulled k8s.gcr.io/etcd:3.5.1-0
[config/images] Pulled k8s.gcr.io/coredns/coredns:v1.8.6
```

Your Kubernetes control-plane has initialized successfully!

To start using your cluster, you need to run the following as a regular user:

```
mkdir -p $HOME/.kube
sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
sudo chown $(id -u):$(id -g) $HOME/.kube/config
```

Alternatively, if you are the root user, you can run:

```
export KUBECONFIG=/etc/kubernetes/admin.conf
```

You should now deploy a pod network to the cluster.

Run "kubectl apply -f [podnetwork].yaml" with one of the options listed at:  
<https://kubernetes.io/docs/concepts/cluster-administration/addons/>

Then you can join any number of worker nodes by running the following on each as root:

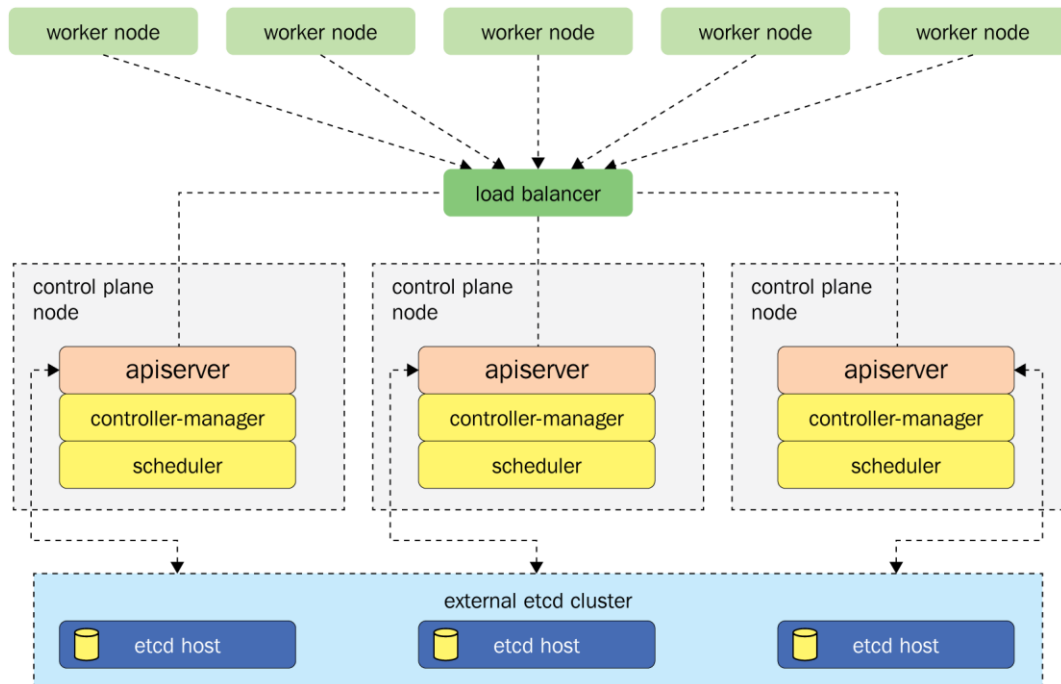
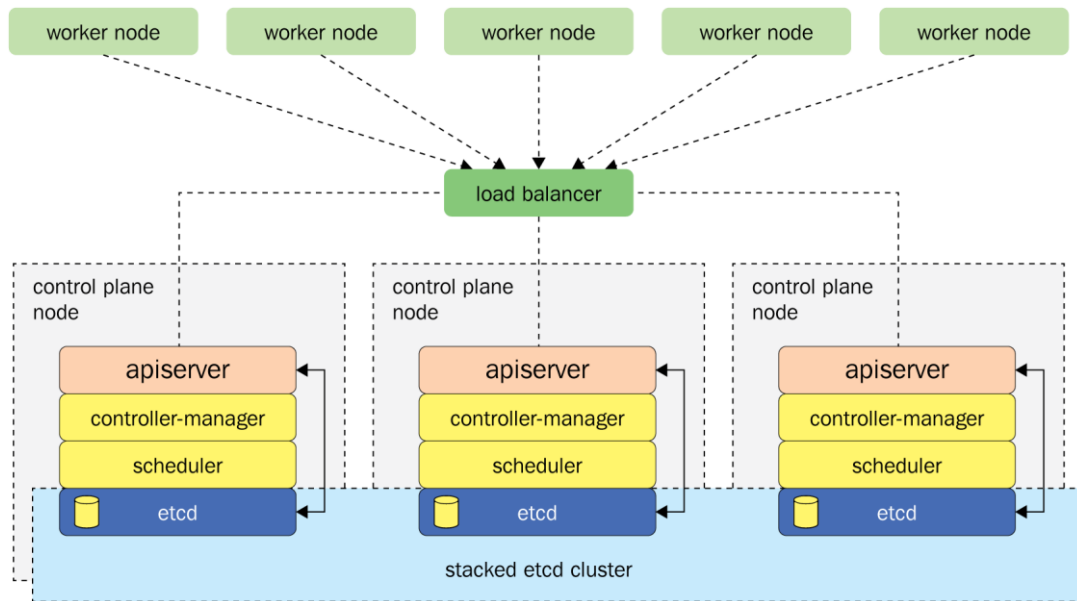
```
kubeadm join 172.16.16.129:6443 --token k626hm.oqwyac35h43x80mg \
--discovery-token-ca-cert-hash sha256:889983a6b87643e598b88533dbe3a68643a623b9a0ed9380561c6a7dbb93b3f0
```

Every 2.0s: kubectl get pods -n calico-system

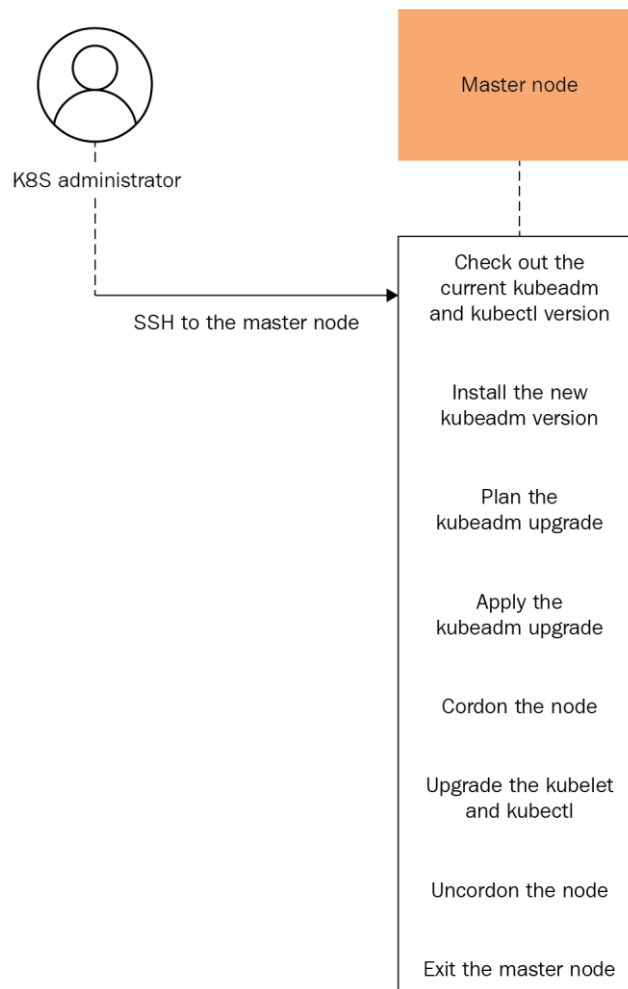
NAME	READY	STATUS	RESTARTS	AGE
calico-kube-controllers-7dddffd6c9-tpxv2	1/1	Running	0	51s
calico-node-f5cnd	1/1	Running	0	51s
calico-typha-84bf84b9b7-tmk5x	1/1	Running	0	51s

```
[cloudmelon@cloudmelonplaysrv:~$ kubectl taint nodes --all node-role.kubernetes.io/master-
node/cloudmelonplaysrv untainted
```

```
cloudmelon@cloudmelonplaysrv:~$ kubectl get nodes -o wide
NAME                STATUS    ROLES                  AGE   VERSION   INTERNAL-IP   EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION   CONTAINER-RUNTIME
cloudmelonplaysrv   Ready     control-plane,master   28h   v1.23.2   172.16.16.129 <none>        Ubuntu 21.10   5.13.0-23-generic   docker://20.10.12
```



## Chapter 3: Maintaining Kubernetes Clusters



```
cloudmelon@cloudmelonplaysrv:~$ apt-cache madison kubeadm
kubeadm | 1.23.3-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.23.2-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.23.1-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.23.0-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.22.6-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.22.5-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.22.4-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.22.3-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.22.2-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.22.1-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
kubeadm | 1.22.0-00 | https://apt.kubernetes.io | kubernetes-xenial/main | arm64 | Packages
```

```
Components that must be upgraded manually after you have upgraded the control plane with 'kubeadm upgrade apply':  
COMPONENT    CURRENT    TARGET  
kubelet       1 x v1.23.2  v1.23.3
```

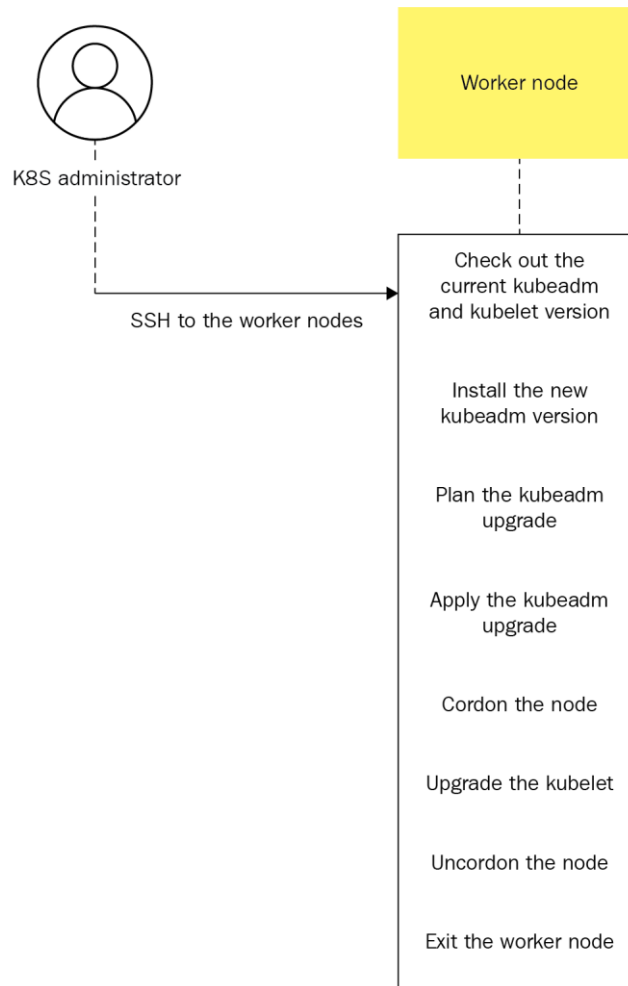
Upgrade to the latest version in the v1.23 series:

COMPONENT	CURRENT	TARGET
kube-apiserver	v1.23.2	v1.23.3
kube-controller-manager	v1.23.2	v1.23.3
kube-scheduler	v1.23.2	v1.23.3
kube-proxy	v1.23.2	v1.23.3
CoreDNS	v1.8.6	v1.8.6
etcd	3.5.1-0	3.5.1-0

```
upgrade/successful] SUCCESS! Your cluster was upgraded to "v1.23.3". Enjoy!
```

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

```
node/cloudmelonplaysrv cordoned  
WARNING: ignoring DaemonSet-managed Pods: calico-system/calico-node-xpvkh, kube-system/kube-proxy-75zqj  
evicting pod tigera-operator/tigera-operator-768d489967-5xbth  
evicting pod calico-system/calico-kube-controllers-7ddd6c9-sjdkf  
evicting pod calico-apiserver/calico-apiserver-64cd47df68-hx2w7  
evicting pod calico-apiserver/calico-apiserver-64cd47df68-j77cg  
evicting pod kube-system/coredns-64897985d-57s4s  
evicting pod calico-system/calico-typha-69f76d55b8-6xtwk  
evicting pod kube-system/coredns-64897985d-7l2zx  
pod/calico-typha-69f76d55b8-6xtwk evicted  
pod/calico-kube-controllers-7ddd6c9-sjdkf evicted  
pod/calico-apiserver-64cd47df68-j77cg evicted  
pod/calico-apiserver-64cd47df68-hx2w7 evicted  
pod/tigera-operator-768d489967-5xbth evicted  
pod/coredns-64897985d-7l2zx evicted  
pod/coredns-64897985d-57s4s evicted  
node/cloudmelonplaysrv drained
```



```
[cloudmelon@cloudmelonplaysrv:~]$ kubectl get po -n kube-system
```

NAME	READY	STATUS	RESTARTS	AGE
coredns-64897985d-57s4s	1/1	Running	0	14d
coredns-64897985d-712zx	1/1	Running	0	14d
etcd-cloudmelonplaysrv	1/1	Running	1	14d
kube-apiserver-cloudmelonplaysrv	1/1	Running	4 (8d ago)	14d
kube-controller-manager-cloudmelonplaysrv	1/1	Running	4 (8d ago)	14d
kube-proxy-vjzv7	1/1	Running	0	14d
kube-scheduler-cloudmelonplaysrv	1/1	Running	4 (8d ago)	14d



```

cloudmelon@cloudmelonplaysrv:~$ kubectl describe po etcd-cloudmelonplaysrv -n kube-system
Name:          etcd-cloudmelonplaysrv
Namespace:     kube-system
Priority:       2000001000
Priority Class Name: system-node-critical
Node:          cloudmelonplaysrv/172.16.16.129
Start Time:    Tue, 25 Jan 2022 05:53:42 +0000
Labels:        component=etcd
               tier=control-plane
Annotations:   kubeadm.kubernetes.io/etcd.advertise-client-urls: https://172.16.16.129:2379
               kubernetes.io/config.hash: 449e5dd74342c261a2886f93dcda3eda
               kubernetes.io/config.mirror: 449e5dd74342c261a2886f93dcda3eda
               kubernetes.io/config.seen: 2022-01-25T05:53:41.313526413Z
               kubernetes.io/config.source: file
               seccomp.security.alpha.kubernetes.io/pod: runtime/default
Status:        Running
IP:            172.16.16.129
IPs:
  IP:          172.16.16.129
Controlled By: Node/cloudmelonplaysrv
Containers:
  etcd:
    Container ID:  docker://84601b9c4fe85d81e0e861bc66bb6a3202a1ec1c8c450e939d221d0570db90bb
    Image:          k8s.gcr.io/etcd:3.5.1-0
    Image ID:       docker-pullable://k8s.gcr.io/etcd@sha256:64b9ea357325d5db9f8a723dcf503b5a449177b17ac87d69481e126bb724c263
    Port:           <none>
    Host Port:      <none>
    Command:
      etcd
      --advertise-client-urls=https://172.16.16.129:2379
      --cert-file=/etc/kubernetes/pki/etcd/server.crt
      --client-cert-auth=true
      --data-dir=/var/lib/etcd
      --initial-advertise-peer-urls=https://172.16.16.129:2380
      --initial-cluster=cloudmelonplaysrv=https://172.16.16.129:2380
      --key-file=/etc/kubernetes/pki/etcd/server.key
      --listen-client-urls=https://127.0.0.1:2379,https://172.16.16.129:2379
      --listen-metrics-urls=http://127.0.0.1:2381
      --listen-peer-urls=https://172.16.16.129:2380
      --name=cloudmelonplaysrv
      --peer-cert-file=/etc/kubernetes/pki/etcd/peer.crt
      --peer-client-cert-auth=true
      --peer-key-file=/etc/kubernetes/pki/etcd/peer.key
      --peer-trusted-ca-file=/etc/kubernetes/pki/etcd/ca.crt
      --snapshot-count=10000
      --trusted-ca-file=/etc/kubernetes/pki/etcd/ca.crt
    State:          Running
      Started:      Tue, 25 Jan 2022 05:53:36 +0000
    Ready:          True
    Restart Count:  1
    Requests:
      cpu:          100m
      memory:       100Mi
    Liveness:       http-get http://127.0.0.1:2381/health delay=10s timeout=15s period=10s #success=1 #failure=8
    Startup:        http-get http://127.0.0.1:2381/health delay=10s timeout=15s period=10s #success=1 #failure=24
    Environment:    <none>
    Mounts:
      /etc/kubernetes/pki/etcd from etcd-certs (rw)
      /var/lib/etcd from etcd-data (rw)
Conditions:
  Type            Status
  Initialized      True
  Ready            True
  ContainersReady  True
  PodScheduled     True
Volumes:
  etcd-certs:
    Type:          HostPath (bare host directory volume)
    Path:           /etc/kubernetes/pki/etcd
    HostPathType:   DirectoryOrCreate
  etcd-data:
    Type:          HostPath (bare host directory volume)
    Path:           /var/lib/etcd
    HostPathType:   DirectoryOrCreate
QoS Class:        Burstable
Node-Selectors:    <none>
Tolerations:       :NoExecute op=Exists
Events:            <none>

```

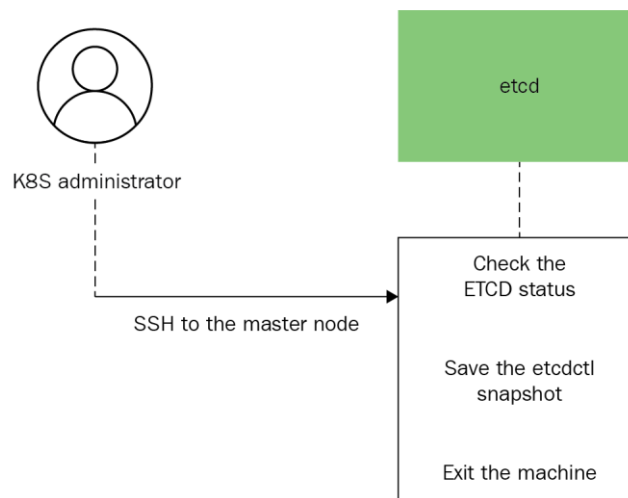
ID	STATUS	NAME	PEER ADDRS	CLIENT ADDRS	IS LEARNER
8d1f17827821818f	started	cloudmelonplaysrv	https://172.16.16.129:2380	https://172.16.16.129:2379	false

ENDPOINT	ID	VERSION	DB SIZE	IS LEADER	IS LEARNER	RAFT TERM	RAFT INDEX	RAFT APPLIED INDEX	ERRORS
https://172.16.16.129:2379	8d1f17827821818f	3.5.1	5.1 MB	true	false	2	2403920	2403920	

ENDPOINT	ID	VERSION	DB SIZE	IS LEADER	IS LEARNER	RAFT TERM	RAFT INDEX	RAFT APPLIED INDEX	ERRORS
https://127.0.0.1:2379	8d1f17827821818f	3.5.1	5.1 MB	true	false	2	2404458	2404458	

```
cloudmelon@cloudmelonplaysrv:~$ etcdctl version
etcdctl version: 3.5.0
API version: 3.5
```

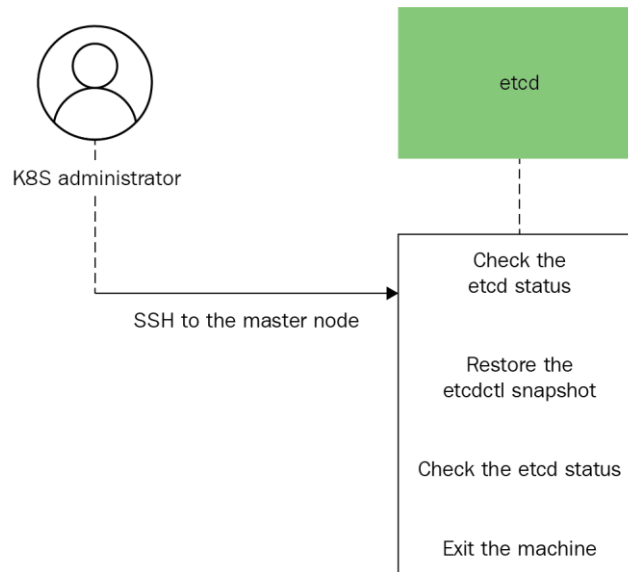
```
cloudmelon@cloudmelonplaysrv:~$ kubectl exec etcd-cloudmelonplaysrv -n kube-system -- sh -c "etcdctl version"
etcdctl version: 3.5.1
API version: 3.5
```



ENDPOINT	ID	VERSION	DB SIZE	IS LEADER	IS LEARNER	RAFT TERM	RAFT INDEX	RAFT APPLIED INDEX	ERRORS
https://172.16.16.129:2379	8d1f17827821818f	3.5.1	5.1 MB	true	false	2	2452141	2452141	

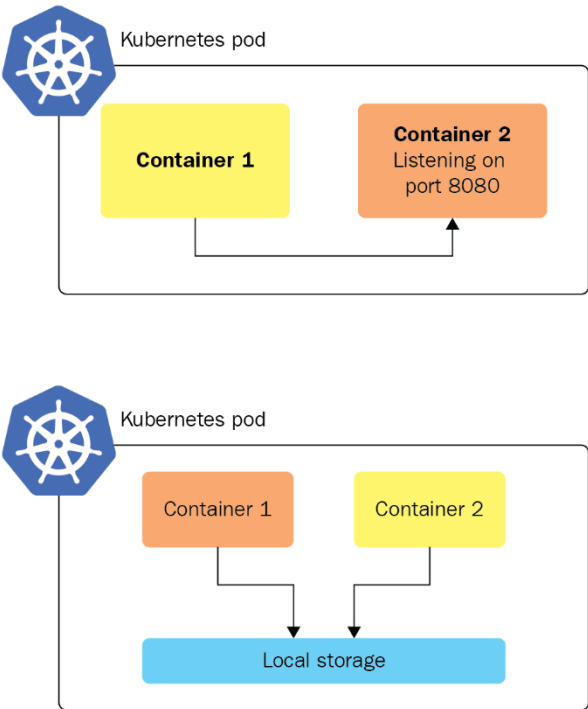
```
{
  "level": "info",
  "ts": 1644881444.2624311,
  "caller": "snapshot/v3_snapshot.go:68",
  "msg": "created temporary db file",
  "path": "snapshotdb.part"
}
{"level": "info", "ts": 1644881444.2660115, "logger": "client", "caller": "v3/maintenance.go:211", "msg": "opened snapshot stream; downloading"}
{"level": "info", "ts": 1644881444.266028, "caller": "snapshot/v3_snapshot.go:76", "msg": "fetching snapshot", "endpoint": "https://172.16.16.129:2379"}
{"level": "info", "ts": 1644881444.2966611, "logger": "client", "caller": "v3/maintenance.go:219", "msg": "completed snapshot read; closing"}
Snapshot saved at snapshotdb
{"level": "info", "ts": 1644881444.2980704, "caller": "snapshot/v3_snapshot.go:91", "msg": "fetched snapshot", "endpoint": "https://172.16.16.129:2379", "size": "5.1 MB", "took": "now"}
{"level": "info", "ts": 1644881444.298164, "caller": "snapshot/v3_snapshot.go:100", "msg": "saved", "path": "snapshotdb"}
```

ENDPOINT	ID	VERSION	DB SIZE	IS LEADER	IS LEARNER	RAFT TERM	RAFT INDEX	RAFT APPLIED INDEX	ERRORS
https://172.16.16.129:2379	8d1f17827821818f	3.5.1	5.1 MB	true	false	2	2455079	2455079	



# Chapter 4: Application Scheduling and Lifecycle Management

Events:					
Type	Reason	Age	From	Message	
Normal	Scheduled	98s	default-scheduler	Successfully assigned default/nginx-pod to cloudmelonplayground	
Normal	Pulling	97s	kubelet	Pulling image "nginx:alpine"	
Normal	Pulled	11s	kubelet	Successfully pulled image "nginx:alpine" in 1m25.997135506s	
Normal	Created	11s	kubelet	Created container nginx-pod	
Normal	Started	11s	kubelet	Started container nginx-pod	

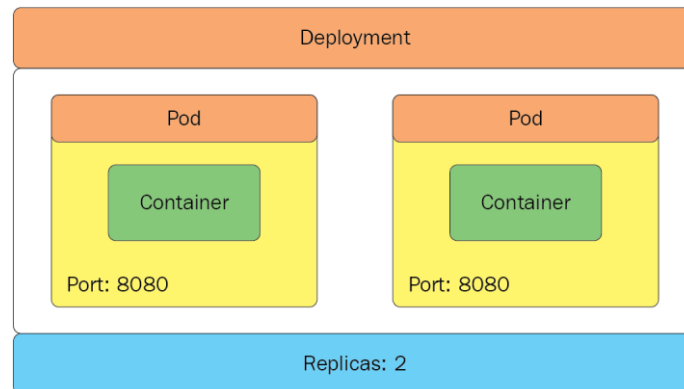


```
[root@cloudmelonplayground:~# k get job
NAME      COMPLETIONS  DURATION  AGE
pi        1/1          27s       2m27s
```

```
[root@cloudmelonplayground:~# k get cronjob
NAME      SCHEDULE      SUSPEND  ACTIVE  LAST SCHEDULE  AGE
hello     */1 * * * *    False   0       8s             79s
```

```
hello-27435182-ld9gw 0/1 Completed 0 2m26s
hello-27435183-8ptg8 0/1 Completed 0 86s
hello-27435184-htsxd 0/1 Completed 0 26s
```

```
[root@cloudmelonplayground:~# k logs hello-27435184-htsxd
Tue Mar  1 05:04:07 UTC 2022
Hello from the Kubernetes cluster
```



```
[root@cloudmelonplayground:~# k get deployment kuberserve
NAME          READY    UP-TO-DATE    AVAILABLE    AGE
kuberserve    0/1      1              0            15s
```

```
[^Croot@cloudmelonplayground:~# k get deploy kuberserve
NAME          READY    UP-TO-DATE    AVAILABLE    AGE
kuberserve    1/1      1              1            2m3s
```

```
root@cloudmelonplayground:~# k describe deploy kuberserve
Name:          kuberserve
Namespace:     default
CreationTimestamp: Wed, 02 Mar 2022 04:27:12 +0000
Labels:        app=kuberserve
Annotations:   deployment.kubernetes.io/revision: 1
Selector:      app=kuberserve
Replicas:      1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType:  RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=kuberserve
  Containers:
    nginx:
      Image:          nginx:latest
      Port:           <none>
      Host Port:      <none>
      Environment:    <none>
      Mounts:         <none>
      Volumes:        <none>
Conditions:
  Type           Status  Reason
  ----           -
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets: <none>
NewReplicaSet:  kuberserve-dfbbf9445 (1/1 replicas created)
Events:
  Type           Reason             Age           From              Message
  ----           -
  Normal         ScalingReplicaSet  2m12s        deployment-controller  Scaled up replica set kuberserve-dfbbf9445 to 1
```

```

# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: apps/v1
kind: Deployment
metadata:
  annotations:
    deployment.kubernetes.io/revision: "1"
  creationTimestamp: "2022-03-02T05:14:42Z"
  generation: 1
  labels:
    app: kuberserve
  name: kuberserve
  namespace: default
  resourceVersion: "198806"
  uid: f61d4c4a-20a6-42f6-94b9-2c974a551eb6
spec:
  progressDeadlineSeconds: 600
  replicas: 1
  revisionHistoryLimit: 10
  selector:
    matchLabels:
      app: kuberserve
  strategy:
    rollingUpdate:
      maxSurge: 25%
      maxUnavailable: 25%
    type: RollingUpdate
  template:
    metadata:
      creationTimestamp: null
      labels:
        app: kuberserve
    spec:
      containers:
      - image: nginx:latest
        imagePullPolicy: Always
        name: nginx
        resources: {}
        terminationMessagePath: /dev/termination-log
        terminationMessagePolicy: File
      dnsPolicy: ClusterFirst
      restartPolicy: Always
      schedulerName: default-scheduler
      securityContext: {}
      terminationGracePeriodSeconds: 30
status:
  availableReplicas: 1
  conditions:
  - lastTransitionTime: "2022-03-02T05:15:17Z"
    lastUpdateTime: "2022-03-02T05:15:17Z"
    message: Deployment has minimum availability.
    reason: MinimumReplicasAvailable
    status: "True"
    type: Available
  - lastTransitionTime: "2022-03-02T05:14:42Z"
    lastUpdateTime: "2022-03-02T05:15:17Z"
    message: ReplicaSet "kuberserve-dfbbf9445" has successfully progressed.
    reason: NewReplicaSetAvailable
    status: "True"
    type: Progressing
  observedGeneration: 1
  readyReplicas: 1
  replicas: 1
  updatedReplicas: 1
~
~
"/tmp/kubect1-edit-545655180.yaml" 66L, 1800C

```



```

root@cloudmelonplayground:~# k describe deploy kuberserve
Name: kuberserve
Namespace: default
CreationTimestamp: Fri, 04 Mar 2022 05:06:32 +0000
Labels: app=kuberserve
Annotations: deployment.kubernetes.io/revision: 2
            kubernetes.io/change-cause: kubectl set image deployment/kuberserve nginx=nginx:1.18.0 --record=true
Selector: app=kuberserve
Replicas: 1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType: RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels: app=kuberserve
  Containers:
    nginx:
      Image: nginx:1.18.0
      Port: <none>
      Host Port: <none>
      Environment: <none>
      Mounts: <none>
      Volumes: <none>
Conditions:
  Type           Status  Reason
  ----           -
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets: <none>
NewReplicaSet: kuberserve-6d9c49fbd6 (1/1 replicas created)
Events:
  Type           Reason             Age           From              Message
  ----           -
  Normal        ScalingReplicaSet   2m31s        deployment-controller Scaled up replica set kuberserve-dfbbf9445 to 1
  Normal        ScalingReplicaSet   15s          deployment-controller Scaled up replica set kuberserve-6d9c49fbd6 to 1
  Normal        ScalingReplicaSet   8s           deployment-controller Scaled down replica set kuberserve-dfbbf9445 to 0

```

```

Name: kuberserve
Namespace: default
CreationTimestamp: Fri, 04 Mar 2022 05:06:32 +0000
Labels: app=kuberserve
Annotations: deployment.kubernetes.io/revision: 5
Selector: app=kuberserve
Replicas: 1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType: RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels: app=kuberserve
  Containers:
    nginx:
      Image: nginx:latest
      Port: <none>
      Host Port: <none>
      Environment: <none>
      Mounts: <none>
      Volumes: <none>
Conditions:
  Type           Status  Reason
  ----           -
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets: <none>
NewReplicaSet: kuberserve-dfbbf9445 (1/1 replicas created)
Events:
  Type           Reason             Age           From              Message
  ----           -
  Normal        ScalingReplicaSet   2m14s        deployment-controller Scaled up replica set kuberserve-6d9c49fbd6 to 1
  Normal        ScalingReplicaSet   75s          deployment-controller Scaled down replica set kuberserve-6d9c49fbd6 to 0
  Normal        ScalingReplicaSet   43s          deployment-controller Scaled up replica set kuberserve-5c5c66bc97 to 1
  Normal        ScalingReplicaSet   36s (x2 over 2m7s) deployment-controller Scaled down replica set kuberserve-dfbbf9445 to 0
  Normal        ScalingReplicaSet   6s (x3 over 4m30s) deployment-controller Scaled up replica set kuberserve-dfbbf9445 to 1
  Normal        ScalingReplicaSet   4s           deployment-controller Scaled down replica set kuberserve-5c5c66bc97 to 0

```

```

root@cloudmelonplayground:~# kubectl rollout history deployment kuberserve
deployment.apps/kuberserve
REVISION  CHANGE-CAUSE
2         kubectl set image deployment/kuberserve nginx=nginx:1.18.0 --record=true
4         <none>
5         <none>

```

```

root@cloudmelonplayground:~# k describe deploy kuberserve
Name:                kuberserve
Namespace:           default
CreationTimestamp:    Fri, 04 Mar 2022 05:06:32 +0000
Labels:              app=kuberserve
Annotations:          deployment.kubernetes.io/revision: 6
                     kubernetes.io/change-cause: kubectl set image deployment/kuberserve nginx=nginx:1.18.0 --record=true
Selector:             app=kuberserve
Replicas:            1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType:        RollingUpdate
MinReadySeconds:     0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=kuberserve
  Containers:
    nginx:
      Image:      nginx:1.18.0
      Port:       <none>
      Host Port:  <none>
      Environment: <none>
      Mounts:     <none>
  Volumes:      <none>
Conditions:
  Type           Status  Reason
  ----           -
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets: <none>
NewReplicaSet:  kuberserve-6d9c49fbd6 (1/1 replicas created)
Events:
  Type           Reason              Age             From              Message
  ----           -
  Normal         ScalingReplicaSet   2m21s          deployment-controller Scaled down replica set kuberserve-6d9c49fbd6 to 0
  Normal         ScalingReplicaSet   109s          deployment-controller Scaled up replica set kuberserve-5c5c66bc97 to 1
  Normal         ScalingReplicaSet   72s (x3 over 5m36s) deployment-controller Scaled up replica set kuberserve-dfbbf9445 to 1
  Normal         ScalingReplicaSet   70s          deployment-controller Scaled down replica set kuberserve-5c5c66bc97 to 0
  Normal         ScalingReplicaSet   7s (x2 over 3m20s) deployment-controller Scaled up replica set kuberserve-6d9c49fbd6 to 1
  Normal         ScalingReplicaSet   5s (x3 over 3m13s) deployment-controller Scaled down replica set kuberserve-dfbbf9445 to 0

```

```
root@cloudmelonplayground:~# k get pods
```

NAME	READY	STATUS	RESTARTS	AGE
hello-27441821-k9lzp	0/1	Completed	0	2m7s
hello-27441822-jhfp2	0/1	Completed	0	67s
hello-27441823-87n2p	0/1	Completed	0	7s
kuberserve-dfbbf9445-6vmkr	1/1	Running	0	61m
kuberserve-dfbbf9445-8hxxv	1/1	Running	0	61m
kuberserve-dfbbf9445-92m4c	1/1	Running	0	61m
kuberserve-dfbbf9445-cb9kz	1/1	Running	0	3m23s
kuberserve-dfbbf9445-tvmql	1/1	Running	0	61m
kuberserve-dfbbf9445-vf69g	1/1	Running	0	61m

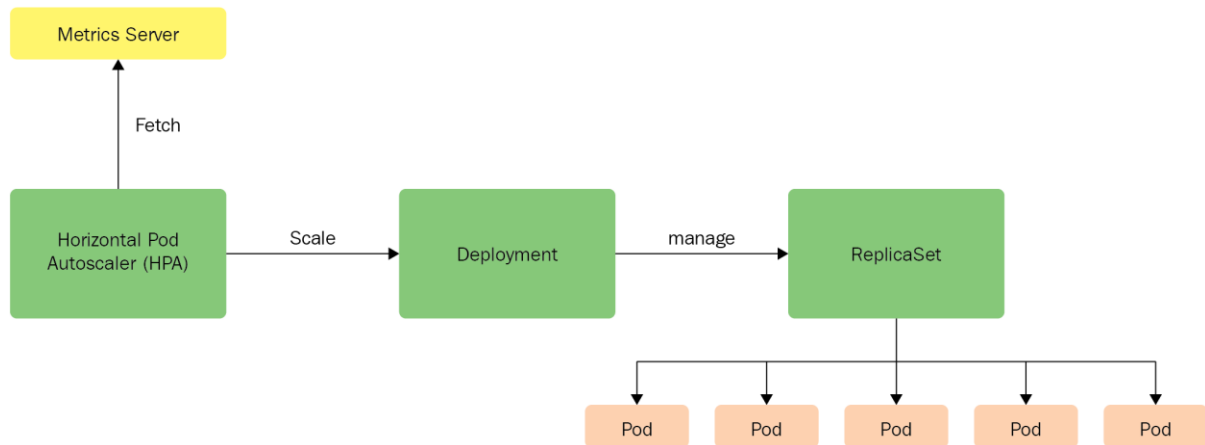
```
[^Croot@cloudmelonplayground:~# k get rs
```

NAME	DESIRED	CURRENT	READY	AGE
frontend	3	3	3	46s
kuberserve-5c5c66bc97	0	0	0	42h
kuberserve-6d9c49fbd6	0	0	0	42h
kuberserve-cd44878f5	0	0	0	41h
kuberserve-dfbbf9445	6	6	6	42h

```
[root@cloudmelonplayground:~# k get rs
```

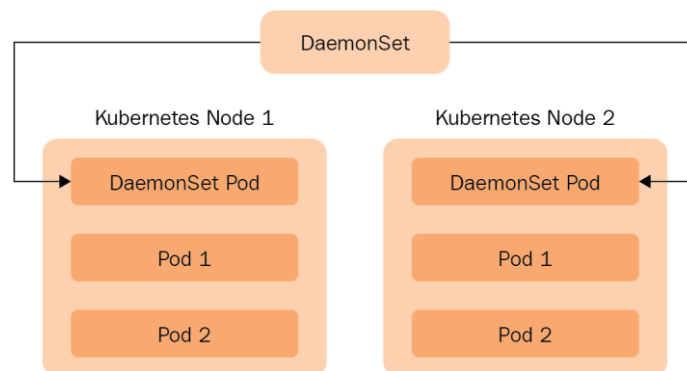
NAME	DESIRED	CURRENT	READY	AGE
frontend	6	6	6	15m





```

root@cloudmelonplayground:~# k get hpa
NAME          REFERENCE          TARGETS          MINPODS  MAXPODS  REPLICAS  AGE
kuberserve    Deployment/kuberserve <unknown>/50%    3         10         0         10s
  
```



```

root@cloudmelonplayground:~# k get ds -n kube-system
NAME          DESIRED  CURRENT  READY  UP-TO-DATE  AVAILABLE  NODE SELECTOR          AGE
fluentd       1        1        1      1            1          <none>                 28s
kube-proxy    1        1        1      1            1          kubernetes.io/os=linux 9d
  
```

```

root@cloudmelonplayground:~# k describe ds fluentd -n kube-system
Name:          fluentd
Selector:      name=fluentd
Node-Selector: <none>
Labels:        k8s-app=fluentd
Annotations:    deprecated.daemonset.template.generation: 1
Desired Number of Nodes Scheduled: 1
Current Number of Nodes Scheduled: 1
Number of Nodes Scheduled with Up-to-date Pods: 1
Number of Nodes Scheduled with Available Pods: 1
Number of Nodes Misscheduled: 0
Pods Status:   1 Running / 0 Waiting / 0 Succeeded / 0 Failed
Pod Template:
  Labels:  name=fluentd
  Containers:
    fluentd:
      Image:          fluentd:latest
      Port:           <none>
      Host Port:      <none>
      Environment:    <none>
      Mounts:         <none>
      Volumes:        <none>
Events:
  Type      Reason              Age   From              Message
  ----      -
Normal      SuccessfulCreate     56s   daemonset-controller   Created pod: fluentd-rrl4m

```

```

root@cloudmelonplayground:~# k get ns
NAME                STATUS    AGE
default             Active    10d
kube-node-lease     Active    10d
kube-public         Active    10d
kube-system         Active    10d

```

```

NAME                STATUS    ROLES    AGE   VERSION   LABELS
cloudmelonplayground Ready    control-plane,master 10d   v1.23.3   beta.kubernetes.io/arch=arm64,beta.kubernetes.io/os=linux,env=dev,kubernetes.io/arch=arm64,kubernetes.io/hostname=cloudmelonplayground,kubernetes.io/os=linux,minikube.k8s.io/commit=362d5fdc0a3dbee389b3d3f1034e8023e72bd3a7,minikube.k8s.io/name=minikube,minikube.k8s.io/primary=true,minikube.k8s.io/updated_at=2022_02_25T01_55_58_0700,minikube.k8s.io/version=v1.25.2,node-role.kubernetes.io/control-plane=node-role.kubernetes.io/master=node.kubernetes.io/exclude-from-external-load-balancers=

```

```

Allocated resources:
  (Total limits may be over 100 percent, i.e., overcommitted.)
Resource           Requests          Limits
-----
cpu                 850m (42%)        0 (0%)
memory              370Mi (9%)        170Mi (4%)
ephemeral-storage   0 (0%)            0 (0%)
hugepages-1Gi       0 (0%)            0 (0%)
hugepages-2Mi       0 (0%)            0 (0%)
hugepages-32Mi      0 (0%)            0 (0%)
hugepages-64Ki      0 (0%)            0 (0%)
Events:              <none>

```

```

[root@cloudmelonplayground:~# k get configmap
NAME                DATA  AGE
kube-root-ca.crt    1      10d
melon-configmap      2      77s

```

```

Name:                melon-configmap
Namespace:            default
Labels:               <none>
Annotations:          <none>

Data
====
myFav:
----
myHome
myKey:
----
myValue

BinaryData
====

Events:   <none>

```

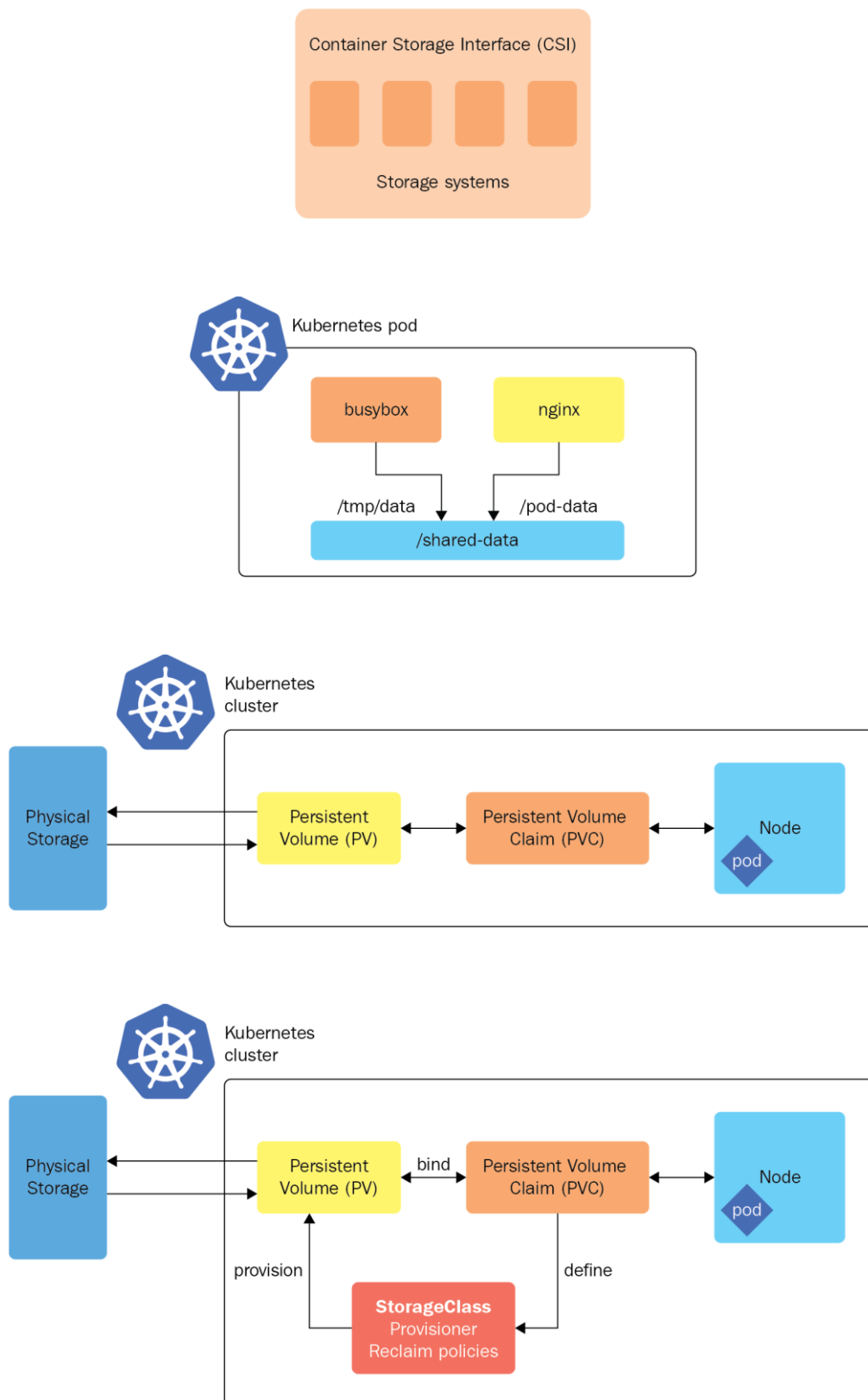
```
root@cloudmelonplayground:~# kubectl logs melon-configmap  
myValue
```

```
^Croot@cloudmelonplayground:~# kubectl exec melon-volume-pod -- ls /etc/config  
myFav  
myKey
```

```
root@cloudmelonplayground:~# k get secrets
```

NAME	TYPE	DATA	AGE
default-token-sp8z4	kubernetes.io/service-account-token	3	10d
melon-secret	Opaque	2	11s

## Chapter 5: Demystifying Kubernetes Storage



```
[root@cloudmelonplayground:~# k get no
NAME                                STATUS    ROLES                                AGE      VERSION
cloudmelonplayground               Ready     control-plane,master                16h      v1.23.3
```

```
apiVersion: v1
kind: Pod
metadata:
  name: my-volume-pod
spec:
  containers:
  - image: busybox
    name: busybox
    command: ["/bin/sh", "-c", "while true; do sleep 3600; done"]
    volumeMounts:
    - name: my-volume
      mountPath: /tmp/storage
  volumes:
  - name: my-volume
    emptyDir: {}
~
~
~
~
~
~
~
~
-- INSERT --
```

```
cloud
apiVersion: v1
kind: Pod
metadata:
  name: my-volume-pod
spec:
  containers:
  - image: busybox
    name: busybox
    command: ["/bin/sh", "-c", "while true; do sleep 3600; done"]
    volumeMounts:
    - name: my-volume
      mountPath: /tmp/storage
  volumes:
  - name: my-volume
    emptyDir: {}
~
~
~
~
~
~
~
~
~
~
:wq!
```

```
root@cloudmelonplayground:~# kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
my-volume-pod       1/1     Running   0           30m
```

```

root@cloudmelonplayground:~# k describe pod my-volume-pod
Name:          my-volume-pod
Namespace:     default
Priority:      0
Node:          cloudmelonplayground/172.16.16.132
Start Time:    Fri, 25 Feb 2022 17:56:06 +0000
Labels:        <none>
Annotations:   <none>
Status:        Running
IP:            172.17.0.3
IPs:
  IP: 172.17.0.3
Containers:
  busybox:
    Container ID:  docker://bbc4ab0af39f481ddea0e9adb4d53f575386d61e4ff87e89329211b2b18b670
    Image:         busybox
    Image ID:      docker-pullable://busybox@sha256:afcc7f1ac1b49db317a7196c902e61c6c3c4607d63599ee1a82d702d249a0ccb
    Port:          <none>
    Host Port:     <none>
    Command:
      /bin/sh
      -c
      while true; do sleep 3600; done
    State:         Running
      Started:      Fri, 25 Feb 2022 17:56:11 +0000
    Ready:         True
    Restart Count:  0
    Environment:   <none>
    Mounts:
      /tmp/storage from my-volume (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-8p6p6 (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  my-volume:
    Type:          EmptyDir (a temporary directory that shares a pod's lifetime)
    Medium:
    SizeLimit:     <unset>
  kube-api-access-8p6p6:
    Type:          Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:  kube-root-ca.crt
    ConfigMapOptional: <nil>
    DownwardAPI:    true
QoS Class:         BestEffort
Node-Selectors:    <none>
Tolerations:       node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                   node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type      Reason      Age   From          Message
  ----      -
  Normal    Scheduled   25s   default-scheduler Successfully assigned default/my-volume-pod to cloudmelonplayground
  Normal    Pulling     24s   kubelet       Pulling image "busybox"
  Normal    Pulled      20s   kubelet       Successfully pulled image "busybox" in 3.989513851s
  Normal    Created     20s   kubelet       Created container busybox
  Normal    Started     20s   kubelet       Started container busybox

```

```

root@cloudmelonplayground:~# k get no
NAME                                STATUS    ROLES                                AGE     VERSION
cloudmelonplayground               Ready     control-plane,master                16h     v1.23.3

```

```

root@cloudmelonplayground:~# k get pv
NAME      CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM   STORAGECLASS   REASON   AGE
data-pv   1Gi        RWO            Retain           Available             local-storage   3s

```

```

root@cloudmelonplayground:~# k get pvc
NAME      STATUS    VOLUME   CAPACITY   ACCESS MODES   STORAGECLASS   AGE
data-pvc  Bound     data-pv   1Gi        RWO            local-storage   4s

```



```

root@cloudmelonplayground:~# k get pv
NAME          CAPACITY  ACCESS MODES  RECLAIM POLICY  STATUS  CLAIM          STORAGECLASS  REASON  AGE
data-pv       1Gi       RWO           Retain          Bound   default/data-pvc  local-storage             13m

```

```

[root@cloudmelonplayground:~# k get pods
NAME          READY  STATUS             RESTARTS  AGE
data-pod      0/1    ContainerCreating   0          4s
[root@cloudmelonplayground:~# k get pods -w
NAME          READY  STATUS             RESTARTS  AGE
data-pod      1/1    Running            0          10s

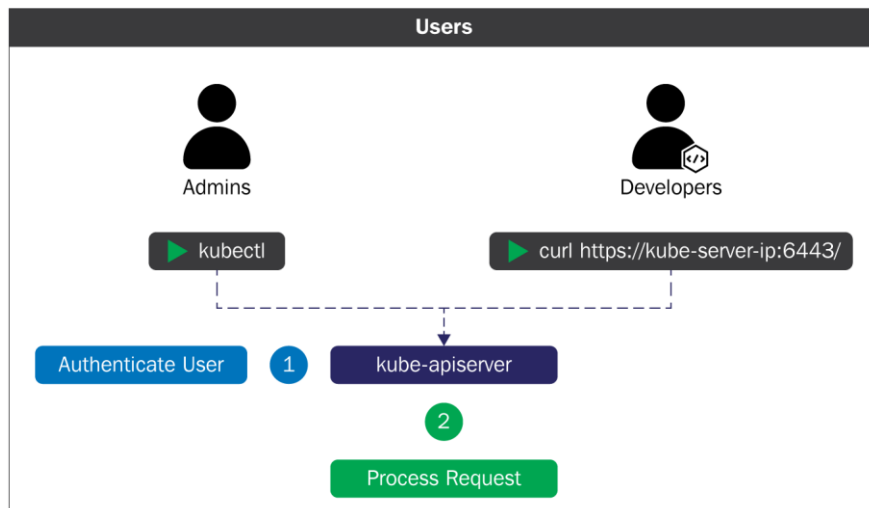
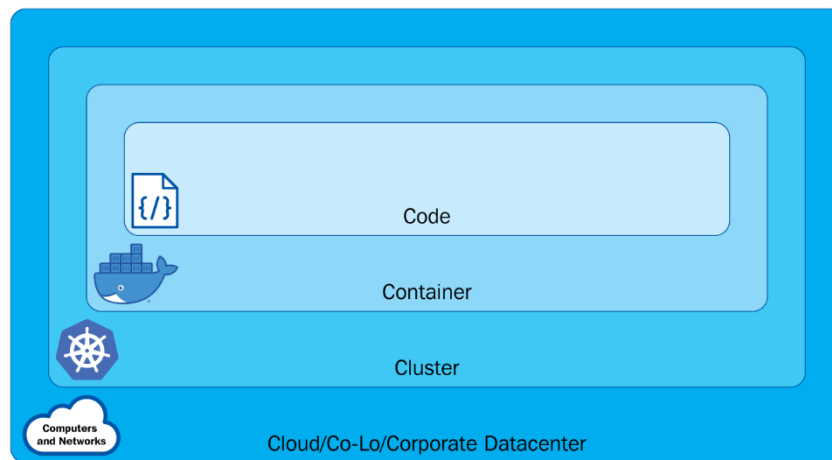
```

```

root@cloudmelonplayground:~# k describe pod data-pod
Name:         data-pod
Namespace:    default
Priority:      0
Node:         cloudmelonplayground/192.168.239.128
Start Time:   Fri, 25 Feb 2022 23:41:42 +0000
Labels:       <none>
Annotations:  <none>
Status:       Running
IP:           172.17.0.3
IPs:
  IP: 172.17.0.3
Containers:
  busybox:
    Container ID:  docker://6b82670cb125b6864b1934565cbae81678eab2f027b708083634daee00752b
    Image:         busybox
    Image ID:      docker-pullable://busybox@sha256:afcc7f1ac1b49db317a7196c902e61c6c3c4607d63599ee1a82d702d249a0ccb
    Port:          <none>
    Host Port:     <none>
    Command:
      /bin/sh
      -c
      while true; do sleep 3600; done
    State:         Running
      Started:      Fri, 25 Feb 2022 23:41:46 +0000
    Ready:         True
    Restart Count:  0
    Environment:   <none>
    Mounts:
      /tmp/data from temp-data (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-l59z4 (ro)
Conditions:
  Type             Status
  Initialized       True
  Ready            True
  ContainersReady  True
  PodScheduled     True
Volumes:
  temp-data:
    Type:          PersistentVolumeClaim (a reference to a PersistentVolumeClaim in the same namespace)
    ClaimName:     data-pvc
    ReadOnly:      false
  kube-api-access-l59z4:
    Type:          Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:  kube-root-ca.crt
    ConfigMapOptional: <nil>
    DownwardAPI:    true
QoS Class:       BestEffort
Node-Selectors:  <none>
Tolerations:     node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                  node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type    Reason      Age   From          Message
  ----    -
  Normal  Scheduled   25s   default-scheduler  Successfully assigned default/data-pod to cloudmelonplayground
  Normal  Pulling    24s   kubelet         Pulling image "busybox"
  Normal  Pulled     21s   kubelet         Successfully pulled image "busybox" in 3.162937658s
  Normal  Created    21s   kubelet         Created container busybox
  Normal  Started    21s   kubelet         Started container busybox

```

## Chapter 6: Securing Kubernetes



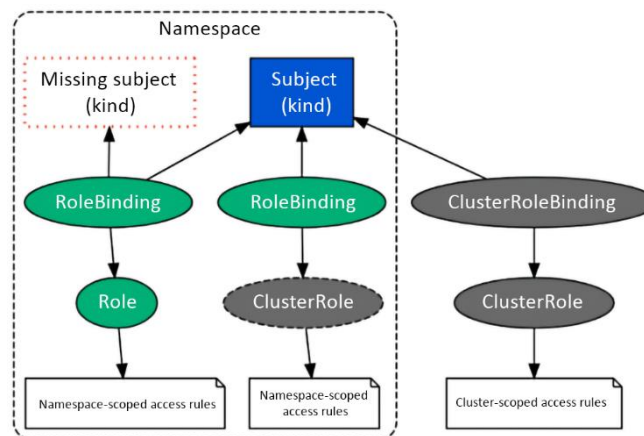
```
cloudmelon@cloudmelonplayground:~$ k get sa -A
```

NAMESPACE	NAME	SECRETS	AGE
default	default	1	59d
fission-builder	default	1	38d
fission-builder	fission-builder	1	38d
fission-function	default	1	38d
fission-function	fission-fetcher	1	38d
fission-ns	default	1	38d
fission	default	1	38d
fission	fission-svc	1	38d
kube-node-lease	default	1	59d
kube-public	default	1	59d
kube-system	attachdetach-controller	1	59d
kube-system	bootstrap-signer	1	59d
kube-system	certificate-controller	1	59d
kube-system	clusterrole-aggregation-controller	1	59d
kube-system	coredns	1	59d
kube-system	cronjob-controller	1	59d
kube-system	daemon-set-controller	1	59d
kube-system	default	1	59d
kube-system	deployment-controller	1	59d
kube-system	disruption-controller	1	59d
kube-system	endpoint-controller	1	59d
kube-system	endpointslice-controller	1	59d
kube-system	endpointslicemirroring-controller	1	59d
kube-system	ephemeral-volume-controller	1	59d
kube-system	expand-controller	1	59d
kube-system	generic-garbage-collector	1	59d
kube-system	horizontal-pod-autoscaler	1	59d
kube-system	job-controller	1	59d
kube-system	kube-proxy	1	59d
kube-system	metrics-server	1	3d16h
kube-system	namespace-controller	1	59d
kube-system	node-controller	1	59d
kube-system	persistent-volume-binder	1	59d
kube-system	pod-garbage-collector	1	59d
kube-system	pvc-protection-controller	1	59d
kube-system	pvc-protection-controller	1	59d
kube-system	replicaset-controller	1	59d
kube-system	replication-controller	1	59d
kube-system	resourcequota-controller	1	59d
kube-system	root-ca-cert-publisher	1	59d
kube-system	service-account-controller	1	59d
kube-system	service-controller	1	59d
kube-system	statefulset-controller	1	59d
kube-system	storage-provisioner	1	59d
kube-system	token-cleaner	1	59d
kube-system	ttl-after-finished-controller	1	59d
kube-system	ttl-controller	1	59d

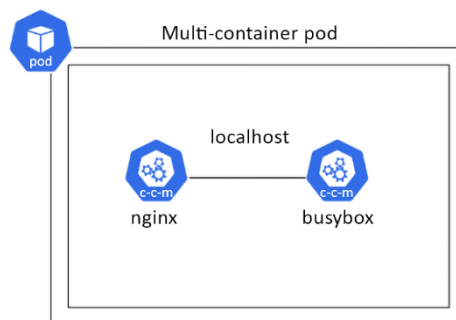
```

cloudmelon@cloudmelonplayground:~/.kube$ kubectl config view
apiVersion: v1
clusters:
- cluster:
    certificate-authority: /home/cloudmelon/.minikube/ca.crt
    extensions:
    - extension:
        last-update: Wed, 11 May 2022 23:47:43 UTC
        provider: minikube.sigs.k8s.io
        version: v1.25.2
        name: cluster_info
    server: https://192.168.49.2:8443
    name: minikube
contexts:
- context:
    cluster: minikube
    extensions:
    - extension:
        last-update: Wed, 11 May 2022 23:47:43 UTC
        provider: minikube.sigs.k8s.io
        version: v1.25.2
        name: context_info
    namespace: default
    user: minikube
    name: minikube
current-context: minikube
kind: Config
preferences: {}
users:
- name: minikube
  user:
    client-certificate: /home/cloudmelon/.minikube/profiles/minikube/client.crt
    client-key: /home/cloudmelon/.minikube/profiles/minikube/client.key

```



## Chapter 7: Demystifying Kubernetes Networking



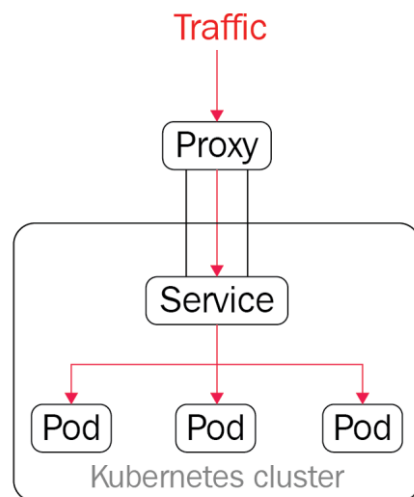
```
cloudmelon@cloudmelonplayground:~$ kubectl exec multi-container-pod -c busybox-sidecar -- wget http://localhost:80
Connecting to localhost:80 (127.0.0.1:80)
saving to 'index.html'
index.html      100% |*****| 615  0:00:00 ETA
'index.html' saved
```

```
cloudmelon@cloudmelonplayground:~$ kubectl exec multi-container-pod -c busybox-sidecar -- cat index.html
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
```

```
cloudmelon@cloudmelonplayground:~$ k get pods -o wide
NAME                READY   STATUS    RESTARTS   AGE   IP          NODE   NOMINATED NODE   READINESS GATES
multi-container-pod  2/2     Running   0           38m   172.17.0.3   minikube   <none>            <none>
nginx                1/1     Running   0           67s   172.17.0.4   minikube   <none>            <none>
```



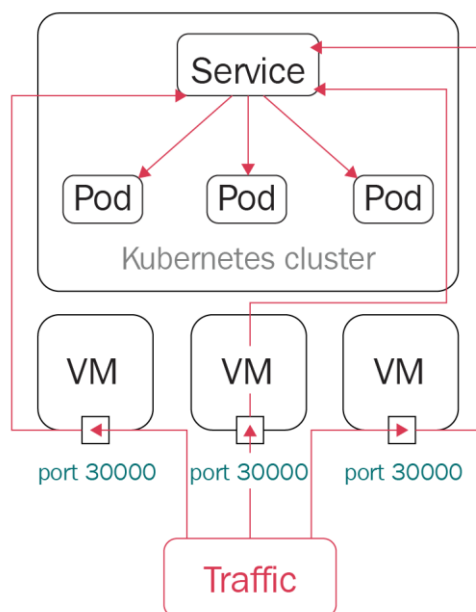
NAME	READY	UP-TO-DATE	AVAILABLE	AGE	CONTAINERS	IMAGES	SELECTOR
nginx	2/2	2	2	3m6s	nginx	nginx	app=nginx

NAME	READY	STATUS	RESTARTS	AGE
nginx	1/1	Running	0	18h
nginx-8f458dc5b-p74rr	1/1	Running	0	4m37s
nginx-8f458dc5b-v8j74	1/1	Running	0	4m37s

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	28h
melon-service	ClusterIP	10.102.194.57	<none>	8080/TCP	7s

NAME	ENDPOINTS	AGE
melon-service	10.1.0.32:80,10.1.0.33:80	6m9s

```
apiVersion: v1
kind: Service
metadata:
  creationTimestamp: "2022-06-12T22:06:18Z"
  labels:
    app: nginx
  name: melon-service
  namespace: default
  resourceVersion: "128419"
  uid: 76d0969d-d211-467b-8952-a4699c7599de
spec:
  clusterIP: 10.102.194.57
  clusterIPs:
  - 10.102.194.57
  internalTrafficPolicy: Cluster
  ipFamilies:
  - IPv4
  ipFamilyPolicy: SingleStack
  ports:
  - port: 8080
    protocol: TCP
    targetPort: 80
  selector:
    app: nginx
  sessionAffinity: None
  type: ClusterIP
status:
  loadBalancer: {}
```



NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE	SELECTOR
webfront-app	NodePort	10.97.148.160	<none>	80:31400/TCP	13m	app=webfront-app

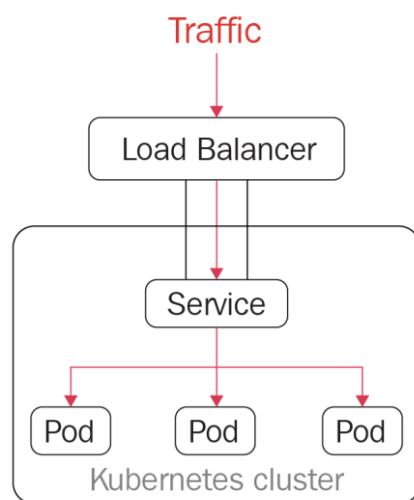
NAME	STATUS	ROLES	AGE	VERSION	INTERNAL-IP
docker-desktop	Ready	control-plane	30h	v1.24.0	192.168.65.4

```

HTTP/1.1 200 OK
Server: nginx/1.21.6
Date: Sun, 12 Jun 2022 23:43:43 GMT
Content-Type: text/html
Content-Length: 615
Last-Modified: Tue, 25 Jan 2022 15:03:52 GMT
Connection: keep-alive
ETag: "61f01158-267"
Accept-Ranges: bytes

```

pod "sandbox-nginx" deleted



NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	33h
melon-service	ClusterIP	10.102.194.57	<none>	8080/TCP	4h57m
nginx-svc	ClusterIP	10.107.75.83	<none>	80/TCP	23h
packt-svc	LoadBalancer	10.96.153.242	localhost	80:31055/TCP	42s
webfront-app	NodePort	10.97.148.160	<none>	80:31400/TCP	3h42m



NAMESPACE	NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
default	kubernetes	ClusterIP	10.96.0.1	<none>	443/TCP	33h
default	melon-service	ClusterIP	10.102.194.57	<none>	8080/TCP	5h1m
default	nginx-svc	ClusterIP	10.107.75.83	<none>	80/TCP	23h
default	packt-svc	LoadBalancer	10.96.153.242	localhost	80:31055/TCP	5m8s
default	webfront-app	NodePort	10.97.148.160	<none>	80:31400/TCP	3h46m
kube-system	kube-dns	ClusterIP	10.96.0.10	<none>	53/UDP,53/TCP,9153/TCP	33h

```

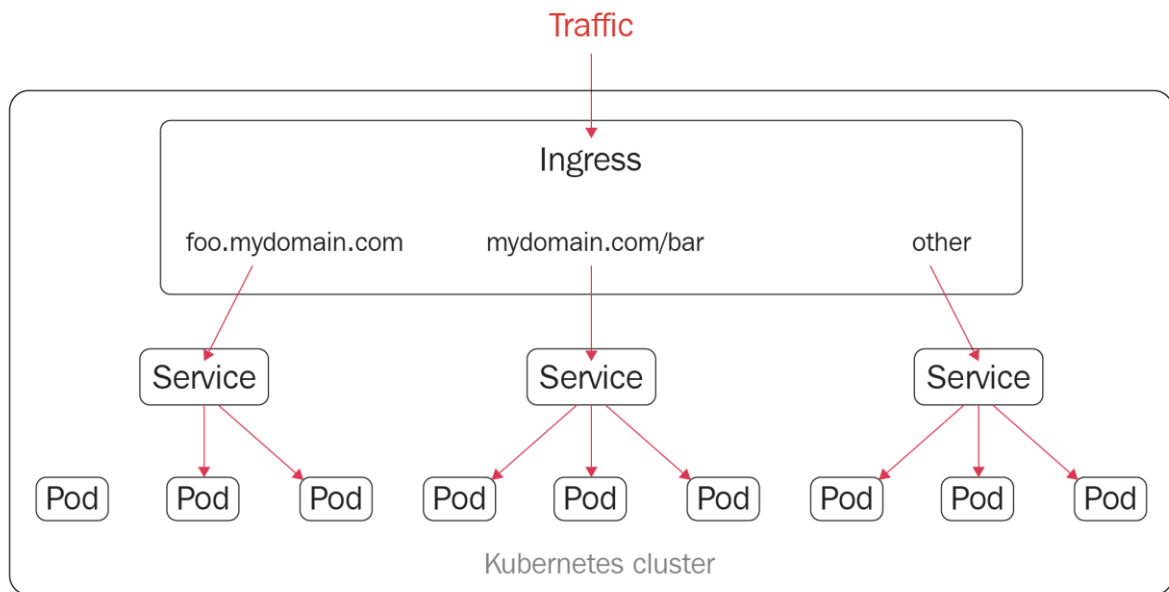
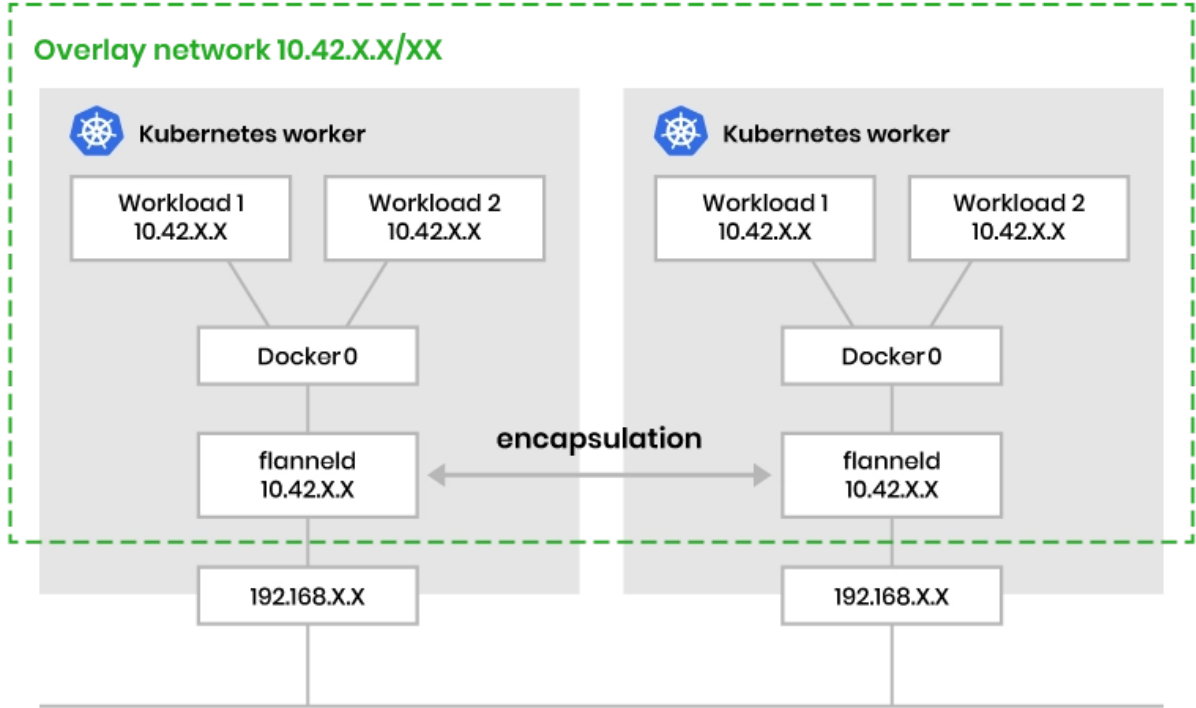
Name: kube-dns
Namespace: kube-system
Labels: k8s-app=kube-dns
        kubernetes.io/cluster-service=true
        kubernetes.io/name=CoreDNS
Annotations: prometheus.io/port: 9153
              prometheus.io/scrape: true
Selector: k8s-app=kube-dns
Type: ClusterIP
IP Family Policy: SingleStack
IP Families: IPv4
IP: 10.96.0.10
IPs: 10.96.0.10
Port: dns 53/UDP
TargetPort: 53/UDP
Endpoints: 10.1.0.2:53,10.1.0.27:53
Port: dns-tcp 53/TCP
TargetPort: 53/TCP
Endpoints: 10.1.0.2:53,10.1.0.27:53
Port: metrics 9153/TCP
TargetPort: 9153/TCP
Endpoints: 10.1.0.2:9153,10.1.0.27:9153
Session Affinity: None
Events: <none>

```

NAMESPACE	NAME	ENDPOINTS	AGE
default	kubernetes	192.168.65.4:6443	33h
default	melon-service	10.1.0.32:80,10.1.0.33:80	5h8m
default	nginx-svc	10.1.0.9:80	24h
default	packt-svc	10.1.0.32:8080,10.1.0.33:8080	11m
default	webfront-app	10.1.0.34:80,10.1.0.35:80	3h53m
kube-system	docker.io-hostpath	<none>	33h
kube-system	kube-dns	10.1.0.2:53,10.1.0.27:53,10.1.0.2:53 + 3 more...	33h

```
cloudmelon@cloudmelonplayground:~$ k get node -o wide
```

NAME	STATUS	ROLES	AGE	VERSION	INTERNAL-IP	EXTERNAL-IP	OS-IMAGE	KERNEL-VERSION	CONTAINER-RUNTIME
minikube	Ready	control-plane,master	77d	v1.23.3	192.168.49.2	<none>	Ubuntu 20.04.2 LTS	5.4.0-100-generic	docker://20.10.12



NAME	READY	STATUS	RESTARTS	AGE
coredns-6d4b75cb6d-4xcmf	1/1	Running	0	82m
coredns-6d4b75cb6d-kj6cq	1/1	Running	0	82m
etcd-docker-desktop	1/1	Running	0	82m
kube-apiserver-docker-desktop	1/1	Running	0	82m
kube-controller-manager-docker-desktop	1/1	Running	0	82m
kube-proxy-9rfxs	1/1	Running	0	82m
kube-scheduler-docker-desktop	1/1	Running	0	82m
storage-provisioner	1/1	Running	0	82m
vpnkit-controller	1/1	Running	6 (4m21s ago)	82m

```

Name: coredns
Namespace: kube-system
CreationTimestamp: Sat, 11 Jun 2022 10:18:48 -0700
Labels: k8s-app=kube-dns
Annotations: deployment.kubernetes.io/revision: 1
Selector: k8s-app=kube-dns
Replicas: 2 desired | 2 updated | 2 total | 2 available | 0 unavailable
StrategyType: RollingUpdate
MinReadySeconds: 0
RollingUpdateStrategy: 1 max unavailable, 25% max surge
Pod Template:
  Labels: k8s-app=kube-dns
  Service Account: coredns
  Containers:
    coredns:
      Image: k8s.gcr.io/coredns/coredns:v1.8.6
      Ports: 53/UDP, 53/TCP, 9153/TCP
      Host Ports: 0/UDP, 0/TCP, 0/TCP
      Args:
        -conf
        /etc/coredns/Corefile
      Limits:
        memory: 170Mi
      Requests:
        cpu: 100m
        memory: 70Mi
      Liveness: http-get http://:8080/health delay=60s timeout=5s period=10s #success=1 #failure=5
      Readiness: http-get http://:8181/ready delay=0s timeout=1s period=10s #success=1 #failure=3
      Environment: <none>
      Mounts:
        /etc/coredns from config-volume (ro)
  Volumes:
    config-volume:
      Type: ConfigMap (a volume populated by a ConfigMap)
      Name: coredns
      Optional: false
      Priority Class Name: system-cluster-critical
Conditions:
  Type          Status  Reason
  ----          -
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets: <none>
NewReplicaSet: coredns-6d4b75cb6d (2/2 replicas created)
Events: <none>

```

```

Server: 10.96.0.10
Address: 10.96.0.10:53

83.75.107.10.in-addr.arpa      name = nginx-svc.default.svc.cluster.local

pod "sandbox" deleted

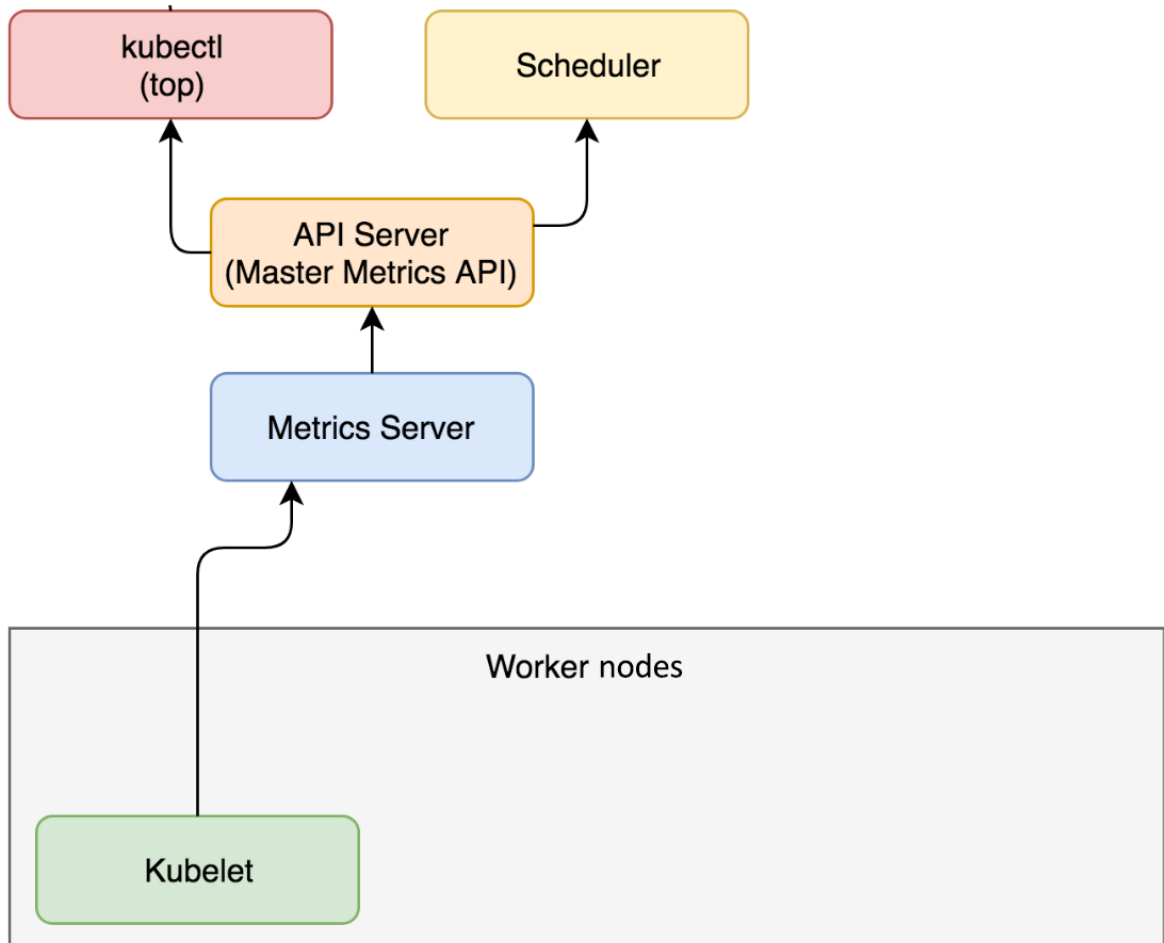
```

```
HTTP/1.1 200 OK
Server: nginx/1.21.6
Date: Sun, 12 Jun 2022 19:36:11 GMT
Content-Type: text/html
Content-Length: 615
Last-Modified: Tue, 25 Jan 2022 15:03:52 GMT
Connection: keep-alive
ETag: "61f01158-267"
Accept-Ranges: bytes
```

```
pod "challenge-nginx" deleted
```

## Chapter 8: Monitoring and Logging Kubernetes Clusters and Applications

"The `kubectl top` command retrieves Metrics Server data through the API"



```
cloudmelon@cloudmelonplayground:~$ minikube addons list
```

ADDON NAME	PROFILE	STATUS	MAINTAINER
ambassador	minikube	disabled	third-party (ambassador)
auto-pause	minikube	disabled	google
csi-hostpath-driver	minikube	disabled	kubernetes
dashboard	minikube	disabled	kubernetes
default-storageclass	minikube	enabled ✓	kubernetes
efk	minikube	disabled	third-party (elastic)
freshpod	minikube	disabled	google
gcp-auth	minikube	disabled	google
gvisor	minikube	disabled	google
helm-tiller	minikube	disabled	third-party (helm)
ingress	minikube	disabled	unknown (third-party)
ingress-dns	minikube	disabled	google
istio	minikube	disabled	third-party (istio)
istio-provisioner	minikube	disabled	third-party (istio)
kong	minikube	disabled	third-party (Kong HQ)
kubevirt	minikube	disabled	third-party (kubevirt)
logviewer	minikube	disabled	unknown (third-party)
metallb	minikube	disabled	third-party (metallb)
metrics-server	minikube	disabled	kubernetes
nvidia-driver-installer	minikube	disabled	google
nvidia-gpu-device-plugin	minikube	disabled	third-party (nvidia)
olm	minikube	disabled	third-party (operator framework)
pod-security-policy	minikube	disabled	unknown (third-party)
portainer	minikube	disabled	portainer.io
registry	minikube	disabled	google
registry-aliases	minikube	disabled	unknown (third-party)
registry-creds	minikube	disabled	third-party (upmc enterprises)
storage-provisioner	minikube	enabled ✓	google
storage-provisioner-gluster	minikube	disabled	unknown (third-party)
volumesnapshots	minikube	disabled	kubernetes

```
cloudmelon@cloudmelonplayground:~$ kubectl get pod,svc -n kube-system
```

NAME	READY	STATUS	RESTARTS	AGE
pod/coredns-64897985d-brqfl	1/1	Running	0	56d
pod/etcd-minikube	1/1	Running	0	56d
pod/kube-apiserver-minikube	1/1	Running	0	56d
pod/kube-controller-manager-minikube	1/1	Running	0	56d
pod/kube-proxy-6r287	1/1	Running	0	56d
pod/kube-scheduler-minikube	1/1	Running	0	56d
pod/metrics-server-6b76bd68b6-rlwb9	1/1	Running	0	78s
pod/storage-provisioner	1/1	Running	1 (56d ago)	56d

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/kube-dns	ClusterIP	10.96.0.10	<none>	53/UDP,53/TCP,9153/TCP	56d
service/metrics-server	ClusterIP	10.102.43.189	<none>	443/TCP	78s

```
cloudmelon@cloudmelonplayground:~$ k describe pod nginx
Name:      nginx
Namespace: default
Priority:   0
Node:      minikube/192.168.49.2
Start Time: Wed, 11 May 2022 23:40:28 +0000
Labels:    run=nginx
Annotations: <none>
Status:    Running
IP:        172.17.0.4
IPs:
  IP: 172.17.0.4
Containers:
  nginx:
    Container ID:  docker://b0cad68476b9be5b61d8db5628a9a6b55fdea849dc795e0b809770d0a231052b
    Image:         nginx
    Image ID:      docker-pullable://nginx@sha256:19da26bd6ef0468ac8ef5c03f01ce1569a4dbfb82d4d7b7ffbd7aed16ad3eb46
    Port:         <none>
    Host Port:    <none>
    State:        Running
      Started:    Wed, 11 May 2022 23:47:45 +0000
    Last State:   Terminated
      Reason:     Completed
      Exit Code:  0
      Started:    Wed, 11 May 2022 23:40:39 +0000
      Finished:   Wed, 11 May 2022 23:47:02 +0000
    Ready:        True
    Restart Count: 1
    Environment:  <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-s2mm2 (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  kube-api-access-s2mm2:
    Type:              Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:      kube-root-ca.crt
    ConfigMapOptional:  <nil>
    DownwardAPI:        true
QoS Class:           BestEffort
Node-Selectors:      <none>
Tolerations:         node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                     node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  Type      Reason              Age   From                      Message
  ----      -
  Normal    Scheduled           12m   default-scheduler        Successfully assigned default/nginx to minikube
  Normal    Pulling             12m   kubelet                  Pulling image "nginx"
  Normal    Pulled              12m   kubelet                  Successfully pulled image "nginx" in 10.509303853s
  Normal    Created             12m   kubelet                  Created container nginx
  Normal    Started             12m   kubelet                  Started container nginx
  Normal    SandboxChanged      5m16s kubelet                  Pod sandbox changed, it will be killed and re-created.
  Normal    Pulling             5m16s kubelet                  Pulling image "nginx"
  Normal    Pulled              5m14s kubelet                  Successfully pulled image "nginx" in 1.772484538s
  Normal    Created             5m14s kubelet                  Created container nginx
  Normal    Started             5m14s kubelet                  Started container nginx
```

```
Events:
  Type      Reason              Age   From                      Message
  ----      -
  Normal    Scheduled           12m   default-scheduler        Successfully assigned default/nginx to minikube
  Normal    Pulling             12m   kubelet                  Pulling image "nginx"
  Normal    Pulled              12m   kubelet                  Successfully pulled image "nginx" in 10.509303853s
  Normal    Created             12m   kubelet                  Created container nginx
  Normal    Started             12m   kubelet                  Started container nginx
  Normal    SandboxChanged      5m16s kubelet                  Pod sandbox changed, it will be killed and re-created.
  Normal    Pulling             5m16s kubelet                  Pulling image "nginx"
  Normal    Pulled              5m14s kubelet                  Successfully pulled image "nginx" in 1.772484538s
  Normal    Created             5m14s kubelet                  Created container nginx
  Normal    Started             5m14s kubelet                  Started container nginx
```

```
Name: coredns-64897985d-brqfl
Namespace: kube-system
Priority: 2000000000
Priority Class Name: system-cluster-critical
Node: minikube/192.168.49.2
Start Time: Mon, 14 Mar 2022 00:25:47 +0000
Labels: k8s-app=kube-dns
        pod-template-hash=64897985d
Annotations: <none>
Status: Running
IP: 172.17.0.2
IPs:
  IP: 172.17.0.2
Controlled By: ReplicaSet/coredns-64897985d
Containers:
  coredns:
    Container ID: docker://c8b57ce2dd8daa5a3c0ba2d282ce3a8c3ed789381bc9fd1e52b95d72338fb277
    Image: k8s.gcr.io/coredns/coredns:v1.8.6
    Image ID: docker-pullable://k8s.gcr.io/coredns/coredns@sha256:5b6ec0d6de9baaf3e92d0f66cd96a25b9edbce8716f5f15dcd1a616b3abd590e
    Ports: 53/UDP, 53/TCP, 9153/TCP
    Host Ports: 0/UDP, 0/TCP, 0/TCP
    Args:
      -conf
      /etc/coredns/Corefile
    State: Running
      Started: Mon, 14 Mar 2022 00:25:48 +0000
    Ready: True
    Restart Count: 0
    Limits:
      memory: 170Mi
    Requests:
      cpu: 100m
      memory: 70Mi
    Liveness: http-get http://:8080/health delay=60s timeout=5s period=10s #success=1 #failure=5
    Readiness: http-get http://:8181/ready delay=0s timeout=1s period=10s #success=1 #failure=3
    Environment: <none>
    Mounts:
      /etc/coredns from config-volume (ro)
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-jn4vd (ro)
Conditions:
  Type           Status
  Initialized     True
  Ready           True
  ContainersReady True
  PodScheduled    True
Volumes:
  config-volume:
    Type: ConfigMap (a volume populated by a ConfigMap)
    Name: coredns
    Optional: false
  kube-api-access-jn4vd:
    Type: Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName: kube-root-ca.crt
    ConfigMapOptional: <nil>
    DownwardAPI: true
QoS Class: Burstable
Node-Selectors:
  kubernetes.io/os=linux
Tolerations:
  CriticalAddonsOnly op=Exists
  node-role.kubernetes.io/control-plane:NoSchedule
  node-role.kubernetes.io/master:NoSchedule
  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
  node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:
  <none>
```



LAST SEEN	TYPE	REASON	OBJECT	MESSAGE
15m	Warning	FailedCreate	replicaset/buildermgr-774879664b	Error creating: pods "buildermgr-774879664b-" is
forbidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
110s	Warning	FailedCreate	replicaset/buildermgr-774879664b	Error creating: pods "buildermgr-774879664b-" is
forbidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
15m	Warning	FailedCreate	replicaset/controller-6d455d7b75	Error creating: pods "controller-6d455d7b75-" is
forbidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
110s	Warning	FailedCreate	replicaset/controller-6d455d7b75	Error creating: pods "controller-6d455d7b75-" is
forbidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
15m	Warning	FailedCreate	replicaset/executor-577ff745f	Error creating: pods "executor-577ff745f-" is for
bidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
110s	Warning	FailedCreate	replicaset/executor-577ff745f	Error creating: pods "executor-577ff745f-" is for
bidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
12m	Warning	FailedCreate	job/fission-v1-15-1-fission-v1.15.1-017	Error creating: pods "fission-v1-15-1-fission-v1.
15.1-017-"	is forbidden: error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
2m9s	Warning	FailedCreate	job/fission-v1-15-1-fission-v1.15.1-017	Error creating: pods "fission-v1-15-1-fission-v1.
15.1-017-"	is forbidden: error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
12m	Warning	FailedCreate	job/fission-v1-15-1-fission-v1.15.1-251	Error creating: pods "fission-v1-15-1-fission-v1.
15.1-251-"	is forbidden: error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
2m9s	Warning	FailedCreate	job/fission-v1-15-1-fission-v1.15.1-251	Error creating: pods "fission-v1-15-1-fission-v1.
15.1-251-"	is forbidden: error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
15m	Warning	FailedCreate	replicaset/kubewatcher-5dc7f4ccb5	Error creating: pods "kubewatcher-5dc7f4ccb5-" is
forbidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
110s	Warning	FailedCreate	replicaset/kubewatcher-5dc7f4ccb5	Error creating: pods "kubewatcher-5dc7f4ccb5-" is
forbidden:	error looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
7m42s	Normal	Starting	node/minikube	Starting kubelet.
7m42s	Normal	NodeHasSufficientMemory	node/minikube	Node minikube status is now: NodeHasSufficientMem
ory				
7m42s	Normal	NodeHasNoDiskPressure	node/minikube	Node minikube status is now: NodeHasNoDiskPressur
e				
7m42s	Normal	NodeHasSufficientPID	node/minikube	Node minikube status is now: NodeHasSufficientPID
7m42s	Normal	NodeAllocatableEnforced	node/minikube	Updated Node Allocatable limit across pods
7m35s	Normal	Starting	node/minikube	
7m35s	Warning	listen tcp4 :31313: bind: address already in use	node/minikube	can't open port "nodePort for default/controller"
(:31313/tcp4), skipping it				
7m35s	Warning	listen tcp4 :31314: bind: address already in use	node/minikube	can't open port "nodePort for default/router" (:3
1314/tcp4), skipping it				
7m28s	Normal	RegisteredNode	node/minikube	Node minikube event: Registered Node minikube in
Controller				
15m	Warning	FailedCreate	replicaset/mqtrigger-keda-79c5b694c7	Error creating: pods "mqtrigger-keda-79c5b694c7-"
is forbidden: error	looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
110s	Warning	FailedCreate	replicaset/mqtrigger-keda-79c5b694c7	Error creating: pods "mqtrigger-keda-79c5b694c7-"
is forbidden: error	looking up service account default/fission-svc: serviceaccount "fission-svc" not found			
14m	Normal	Killing	pod/nginx-85b98978db-kqfs	Stopping container nginx
14m	Normal	Scheduled	pod/nginx	Successfully assigned default/nginx to minikube
14m	Normal	Pulling	pod/nginx	Pulling image "nginx"
14m	Normal	Pulled	pod/nginx	Successfully pulled image "nginx" in 10.509303853
s				
14m	Normal	Created	pod/nginx	Created container nginx
14m	Normal	Started	pod/nginx	Started container nginx
7m36s	Normal	SandboxChanged	pod/nginx	Pod sandbox changed, it will be killed and re-cre
ated.				
7m36s	Normal	Pulling	pod/nginx	Pulling image "nginx"
7m34s	Normal	Pulled	pod/nginx	Successfully pulled image "nginx" in 1.772484538s
7m34s	Normal	Created	pod/nginx	Created container nginx
7m34s	Normal	Started	pod/nginx	Started container nginx

```

Name: minikube
Roles: control-plane,master
Labels: beta.kubernetes.io/arch=arm64
        beta.kubernetes.io/os=linux
        kubernetes.io/arch=arm64
        kubernetes.io/hostname=minikube
        kubernetes.io/os=linux
        minikube.k8s.io/commit=362d5fdc0a3dbec389b3d3f1034e0823e72bd3a7
        minikube.k8s.io/name=minikube
        minikube.k8s.io/primary=true
        minikube.k8s.io/updated_at=2022_03_14T00_25_34_0700
        minikube.k8s.io/version=v1.25.2
        node-role.kubernetes.io/control-plane=
        node-role.kubernetes.io/master=
Annotations: kubeadm.alpha.kubernetes.io/cri-socket: /var/run/dockerhim.sock
        node.alpha.kubernetes.io/ttl: 0
        volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp: Mon, 14 Mar 2022 00:25:31 +0000
Taints: <none>
Unschedulable: false
Lease:
  HolderIdentity: minikube
  AcquireTime: <unset>
  RenewTime: Wed, 11 May 2022 22:52:06 +0000
Conditions:
  Type          Status  LastHeartbeatTime  LastTransitionTime  Reason  Message
  ---          -
MemoryPressure False   Wed, 11 May 2022 22:47:21 +0000  Mon, 14 Mar 2022 00:25:30 +0000  KubelAtHasSufficientMemory  kubelet has sufficient memory available
DiskPressure   False   Wed, 11 May 2022 22:47:21 +0000  Mon, 14 Mar 2022 00:25:30 +0000  KubelAtHasNoDiskPressure    kubelet has no disk pressure
PIDPressure     False   Wed, 11 May 2022 22:47:21 +0000  Mon, 14 Mar 2022 00:25:30 +0000  KubelAtHasSufficientPID      kubelet has sufficient PID available
Ready           True    Wed, 11 May 2022 22:47:21 +0000  Mon, 14 Mar 2022 00:25:44 +0000  KubeletReady                 kubelet is posting ready status
Addresses:
  InternalIP: 192.168.49.2
  Hostname: minikube
Capacity:
  cpu: 2
  ephemeral-storage: 18959024Ki
  hugepages-1Gi: 0
  hugepages-2Mi: 0
  hugepages-32Mi: 0
  hugepages-64Ki: 0
  memory: 4013108Ki
  pods: 110
Allocatable:
  cpu: 2
  ephemeral-storage: 18959024Ki
  hugepages-1Gi: 0
  hugepages-2Mi: 0
  hugepages-32Mi: 0
  hugepages-64Ki: 0
  memory: 4013108Ki
  pods: 110
System Info:
  Machine ID: 7f42765e713c4b909dde4d5f15b8d18f
  System UUID: ff980398-c78c-4c3d-89aa-32ce58f5295c
  Boot ID: 9b15b735-3850-4918-b69c-b998a454af74
  Kernel Version: 5.4.0-100-generic
  OS Image: Ubuntu 20.04.2 LTS
  Operating System: linux
  Architecture: arm64
  Container Runtime Version: docker://20.10.12
  Kubelet Version: v1.23.3
  Kube-proxy Version: v1.23.3
PodCIDR: 10.244.0.0/24
PodCIDRs: 10.244.0.0/24
Non-terminated Pods: (9 in total)
  Namespace      Name
  ---          -
default          nginx-85b98978db-kqfq
kube-system      coredns-64897985d-brqfl
kube-system      etcd-minikube
kube-system      kube-apiserver-minikube
kube-system      kube-controller-manager-minikube
kube-system      kube-proxy-6r287
kube-system      kube-scheduler-minikube
kube-system      metrics-server-6b76bd68b6-rlb9
kube-system      storage-provisioner
CPU Requests  CPU Limits  Memory Requests  Memory Limits  Age
---          -
default      nginx-85b98978db-kqfq  0 (0%)  0 (0%)  0 (0%)  0 (0%)  38d
kube-system  coredns-64897985d-brqfl  100m (5%)  0 (0%)  70Mi (1%)  170Mi (4%)  58d
kube-system  etcd-minikube  100m (5%)  0 (0%)  100Mi (2%)  0 (0%)  58d
kube-system  kube-apiserver-minikube  250m (12%)  0 (0%)  0 (0%)  0 (0%)  58d
kube-system  kube-controller-manager-minikube  200m (10%)  0 (0%)  0 (0%)  0 (0%)  58d
kube-system  kube-proxy-6r287  0 (0%)  0 (0%)  0 (0%)  0 (0%)  58d
kube-system  kube-scheduler-minikube  100m (5%)  0 (0%)  0 (0%)  0 (0%)  58d
kube-system  metrics-server-6b76bd68b6-rlb9  100m (5%)  0 (0%)  300Mi (7%)  0 (0%)  2d22h
kube-system  storage-provisioner  0 (0%)  0 (0%)  0 (0%)  0 (0%)  58d
Allocated resources:
(Total limits may be over 100 percent, i.e., overcommitted.)
Resource      Requests  Limits
-----
cpu           850m (42%)  0 (0%)
memory        470Mi (11%)  170Mi (4%)
ephemeral-storage  0 (0%)  0 (0%)
hugepages-1Gi  0 (0%)  0 (0%)
hugepages-2Mi  0 (0%)  0 (0%)
hugepages-32Mi  0 (0%)  0 (0%)
hugepages-64Ki  0 (0%)  0 (0%)
Events: <none>

```

```

cloudmelon@cloudmelonplayground:~$ k get node -o wide
NAME      STATUS    ROLES    AGE      VERSION    INTERNAL-IP    EXTERNAL-IP    OS-IMAGE      KERNEL-VERSION    CONTAINER-RUNTIME
minikube  Ready     control-plane,master  59d      v1.23.3    192.168.49.2    <none>         Ubuntu 20.04.2 LTS  5.4.0-100-generic  docker://20.10.12
cloudmelon@cloudmelonplayground:~$ k get node
NAME      STATUS    ROLES    AGE      VERSION
minikube  Ready     control-plane,master  59d      v1.23.3

```

```
cloudmelon@cloudmelonplayground:~$ k logs nginx
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2022/05/11 23:47:45 [notice] 1#1: using the "epoll" event method
2022/05/11 23:47:45 [notice] 1#1: nginx/1.21.6
2022/05/11 23:47:45 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2022/05/11 23:47:45 [notice] 1#1: OS: Linux 5.4.0-100-generic
2022/05/11 23:47:45 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/05/11 23:47:45 [notice] 1#1: start worker processes
2022/05/11 23:47:45 [notice] 1#1: start worker process 32
2022/05/11 23:47:45 [notice] 1#1: start worker process 33
```

```
cloudmelon@cloudmelonplayground:~$ k logs counter -c count
0: Thu May 12 04:34:40 UTC 2022
1: Thu May 12 04:34:41 UTC 2022
2: Thu May 12 04:34:42 UTC 2022
3: Thu May 12 04:34:43 UTC 2022
4: Thu May 12 04:34:44 UTC 2022
5: Thu May 12 04:34:45 UTC 2022
6: Thu May 12 04:34:46 UTC 2022
7: Thu May 12 04:34:47 UTC 2022
8: Thu May 12 04:34:48 UTC 2022
9: Thu May 12 04:34:49 UTC 2022
10: Thu May 12 04:34:50 UTC 2022
11: Thu May 12 04:34:51 UTC 2022
12: Thu May 12 04:34:52 UTC 2022
13: Thu May 12 04:34:53 UTC 2022
14: Thu May 12 04:34:54 UTC 2022
15: Thu May 12 04:34:55 UTC 2022
16: Thu May 12 04:34:56 UTC 2022
```

11: Thu May 12 04:34:51 UTC 2022  
12: Thu May 12 04:34:52 UTC 2022  
13: Thu May 12 04:34:53 UTC 2022  
14: Thu May 12 04:34:54 UTC 2022  
15: Thu May 12 04:34:55 UTC 2022  
16: Thu May 12 04:34:56 UTC 2022  
17: Thu May 12 04:34:57 UTC 2022  
18: Thu May 12 04:34:58 UTC 2022  
19: Thu May 12 04:34:59 UTC 2022  
20: Thu May 12 04:35:00 UTC 2022  
21: Thu May 12 04:35:01 UTC 2022  
22: Thu May 12 04:35:02 UTC 2022  
23: Thu May 12 04:35:03 UTC 2022  
24: Thu May 12 04:35:04 UTC 2022  
25: Thu May 12 04:35:05 UTC 2022  
26: Thu May 12 04:35:06 UTC 2022  
27: Thu May 12 04:35:07 UTC 2022  
28: Thu May 12 04:35:08 UTC 2022  
29: Thu May 12 04:35:09 UTC 2022  
30: Thu May 12 04:35:10 UTC 2022  
31: Thu May 12 04:35:11 UTC 2022  
32: Thu May 12 04:35:12 UTC 2022  
33: Thu May 12 04:35:13 UTC 2022  
34: Thu May 12 04:35:14 UTC 2022  
35: Thu May 12 04:35:15 UTC 2022  
36: Thu May 12 04:35:16 UTC 2022  
37: Thu May 12 04:35:17 UTC 2022  
38: Thu May 12 04:35:18 UTC 2022  
39: Thu May 12 04:35:19 UTC 2022  
40: Thu May 12 04:35:20 UTC 2022  
41: Thu May 12 04:35:21 UTC 2022  
42: Thu May 12 04:35:22 UTC 2022  
43: Thu May 12 04:35:23 UTC 2022  
44: Thu May 12 04:35:24 UTC 2022  
45: Thu May 12 04:35:25 UTC 2022  
46: Thu May 12 04:35:26 UTC 2022

## Chapter 9: Troubleshooting Cluster Components and Applications

```
apiVersion: v1
clusters:
- cluster:
    certificate-authority-data: DATA+OMITTED
    server: https://kubernetes.docker.internal:6443
  name: docker-desktop
contexts:
- context:
    cluster: docker-desktop
    user: docker-desktop
  name: docker-desktop
current-context: docker-desktop
kind: Config
preferences: {}
users:
- name: docker-desktop
  user:
    client-certificate-data: REDACTED
    client-key-data: REDACTED
```

```
Kubernetes control plane is running at https://kubernetes.docker.internal:6443
CoreDNS is running at https://kubernetes.docker.internal:6443/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
```

```

===== START logs for container echoserver of pod default/echoserver =====
failed to try resolving symlinks in path "/var/log/pods/default_echoserver_a6c40e19-2b04-48ab-b948-ed4c085fe0e0/echoserver/0.log": ls
tat /var/log/pods/default_echoserver_a6c40e19-2b04-48ab-b948-ed4c085fe0e0: no such file or directory===== END logs for container echos
erver of pod default/echoserver =====
===== START logs for container nginx of pod default/nginx =====
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2022/06/19 04:05:53 [notice] 1#1: using the "epoll" event method
2022/06/19 04:05:53 [notice] 1#1: nginx/1.21.6
2022/06/19 04:05:53 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2022/06/19 04:05:53 [notice] 1#1: OS: Linux 5.10.102.1-microsoft-standard-WSL2
2022/06/19 04:05:53 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/06/19 04:05:53 [notice] 1#1: start worker processes
2022/06/19 04:05:53 [notice] 1#1: start worker process 31
2022/06/19 04:05:53 [notice] 1#1: start worker process 32
2022/06/19 04:05:53 [notice] 1#1: start worker process 33
2022/06/19 04:05:53 [notice] 1#1: start worker process 34
2022/06/19 04:05:53 [notice] 1#1: start worker process 35
2022/06/19 04:05:53 [notice] 1#1: start worker process 36
2022/06/19 04:05:53 [notice] 1#1: start worker process 37
2022/06/19 04:05:53 [notice] 1#1: start worker process 38
2022/06/19 04:05:53 [notice] 1#1: start worker process 39
2022/06/19 04:05:53 [notice] 1#1: start worker process 40
2022/06/19 04:05:53 [notice] 1#1: start worker process 41
2022/06/19 04:05:53 [notice] 1#1: start worker process 42
2022/06/19 04:05:53 [notice] 1#1: start worker process 43
2022/06/19 04:05:53 [notice] 1#1: start worker process 44
2022/06/19 04:05:53 [notice] 1#1: start worker process 45
2022/06/19 04:05:53 [notice] 1#1: start worker process 46
2022/06/19 04:05:53 [notice] 1#1: start worker process 47
2022/06/19 04:05:53 [notice] 1#1: start worker process 48
2022/06/19 04:05:53 [notice] 1#1: start worker process 49
2022/06/19 04:05:53 [notice] 1#1: start worker process 50
===== END logs for container nginx of pod default/nginx =====

```

NAME	STATUS	ROLES	AGE	VERSION
docker-desktop	Ready	control-plane	7d10h	v1.24.0

```

Name:          docker-desktop
Roles:         control-plane
Labels:        beta.kubernetes.io/arch=amd64
               beta.kubernetes.io/os=linux
               kubernetes.io/arch=amd64
               kubernetes.io/hostname=docker-desktop
               kubernetes.io/os=linux
               node-role.kubernetes.io/control-plane=
Annotations:   node.kubernetes.io/exclude-from-external-load-balancers=
               kubeadm.alpha.kubernetes.io/cri-socket: unix:///var/run/cni-dockerd.sock
               node.alpha.kubernetes.io/ttl: 0
               volumes.kubernetes.io/controller-managed-attach-detach: true
CreationTimestamp: Sat, 11 Jun 2022 10:18:45 -0700
Taints:        <none>
Unschedulable: false
Lease:
  HolderIdentity: docker-desktop
  AcquireTime:    <unset>
  RenewTime:      Sat, 18 Jun 2022 21:10:51 -0700
Conditions:
  Type           Status  LastHeartbeatTime   LastTransitionTime   Reason              Message
  ----           -
MemoryPressure   False   Sat, 18 Jun 2022 21:10:52 -0700   Sat, 11 Jun 2022 10:18:43 -0700   KubeletHasSufficientMemory   kubelet has sufficient memory available
DiskPressure     False   Sat, 18 Jun 2022 21:10:52 -0700   Sat, 11 Jun 2022 10:18:43 -0700   KubeletHasNoDiskPressure     kubelet has no disk pressure
PIDPressure      False   Sat, 18 Jun 2022 21:10:52 -0700   Sat, 11 Jun 2022 10:18:43 -0700   KubeletHasSufficientPID      kubelet has sufficient PID available
Ready           True    Sat, 18 Jun 2022 21:10:52 -0700   Sat, 11 Jun 2022 10:19:16 -0700   KubeletReady                  kubelet is posting ready status

Addresses:
  InternalIP: 192.168.65.4
  Hostname:   docker-desktop
Capacity:
  cpu:                20
  ephemeral-storage: 263174212Mi
  hugepages-1Gi:      0
  hugepages-2Mi:      0
  memory:             52382988Ki
  pods:               110
Allocatable:
  cpu:                20
  ephemeral-storage: 242541353378
  hugepages-1Gi:      0
  hugepages-2Mi:      0
  memory:             52280588Ki
  pods:               110
System Info:
  Machine ID:          f572738f-ad78-4ffe-b9ba-e2d406999e3e
  System UUID:         f572738f-ad78-4ffe-b9ba-e2d406999e3e
  Boot ID:             29ef0153-f41b-434b-86af-7be2f1260d8c
  Kernel Version:      5.10.102.1-microsoft-standard-WSL2
  OS Image:            Docker Desktop
  Operating System:    linux
  Architecture:        amd64
  Container Runtime Version: docker://20.10.16
  Kubelet Version:      v1.24.0
  Kube-Proxy Version:   v1.24.0
Non-terminated Pods:   (17 in total)
Namespace              Name
-----
default                nginx
default                nginx-8f458dc5b-p74rr
default                nginx-8f458dc5b-v8j74
default                nginx-v2
default                test
default                webfront-app-5c474b5bcc-nsvtt
default                webfront-app-5c474b5bcc-zrwq2
kube-system            coredns-6d4b75cb6d-4h89j
kube-system            coredns-6d4b75cb6d-kj6cq
kube-system            etcd-docker-desktop
kube-system            kube-apiserver-docker-desktop

```

CPU Requests	CPU Limits	Memory Requests	Memory Limits	Age	-----	7d1h	----
0 (0%)	0 (0%)	0 (0%)	0 (0%)	6d6h			
0 (0%)	0 (0%)	0 (0%)	0 (0%)	6d6h			
0 (0%)	0 (0%)	0 (0%)	0 (0%)	7d1h			
0 (0%)	0 (0%)	0 (0%)	0 (0%)	7d			
0 (0%)	0 (0%)	0 (0%)	0 (0%)	6d4h			
0 (0%)	0 (0%)	0 (0%)	0 (0%)	6d4h			
100m (0%)	0 (0%)	70Mi (0%)	170Mi (0%)	6d23h			
100m (0%)	0 (0%)	70Mi (0%)	170Mi (0%)	7d10h			
100m (0%)	0 (0%)	100Mi (0%)	0 (0%)	7d10h			
250m (1%)	0 (0%)	0 (0%)	0 (0%)	7d10h			

```

Conditions:
  Type           Status  LastHeartbeatTime   LastTransitionTime   Reason              Message
  ----           -
MemoryPressure   False   Tue, 21 Jun 2022 15:13:26 -0700   Sat, 11 Jun 2022 10:18:43 -0700   KubeletHasSufficientMemory   kubelet has sufficient memory available
DiskPressure     False   Tue, 21 Jun 2022 15:13:26 -0700   Sat, 11 Jun 2022 10:18:43 -0700   KubeletHasNoDiskPressure     kubelet has no disk pressure
PIDPressure      False   Tue, 21 Jun 2022 15:13:26 -0700   Sat, 11 Jun 2022 10:18:43 -0700   KubeletHasSufficientPID      kubelet has sufficient PID available
Ready           True    Tue, 21 Jun 2022 15:13:26 -0700   Sat, 11 Jun 2022 10:19:16 -0700   KubeletReady                  kubelet is posting ready status

```

```

Allocated resources:
  (Total limits may be over 100 percent, i.e., overcommitted.)
Resource           Requests   Limits
-----
cpu                950m (4%) 100m (0%)
memory            290Mi (0%) 390Mi (0%)
ephemeral-storage 0 (0%)     0 (0%)
hugepages-1Gi     0 (0%)     0 (0%)
hugepages-2Mi     0 (0%)     0 (0%)

```



Non-terminated Pods: (13 in total)						
Namespace	Name	CPU Requests	CPU Limits	Memory Requests	Memory Limits	Age
default	nginx	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9d
default	nginx-v2	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9d
default	test	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9d
kube-system	coredns-6d4b75cb6d-4h89j	100m (0%)	0 (0%)	70Mi (0%)	170Mi (0%)	9d
kube-system	coredns-6d4b75cb6d-kj6cq	100m (0%)	0 (0%)	70Mi (0%)	170Mi (0%)	10d
kube-system	etcd-docker-desktop	100m (0%)	0 (0%)	100Mi (0%)	0 (0%)	10d
kube-system	kube-apiserver-docker-desktop	250m (1%)	0 (0%)	0 (0%)	0 (0%)	10d
kube-system	kube-controller-manager-docker-desktop	200m (1%)	0 (0%)	0 (0%)	0 (0%)	10d
kube-system	kube-flannel-ds-vnh4k	100m (0%)	100m (0%)	50Mi (0%)	50Mi (0%)	8d
kube-system	kube-proxy-9rfxs	0 (0%)	0 (0%)	0 (0%)	0 (0%)	10d
kube-system	kube-scheduler-docker-desktop	100m (0%)	0 (0%)	0 (0%)	0 (0%)	10d
kube-system	storage-provisioner	0 (0%)	0 (0%)	0 (0%)	0 (0%)	10d
kube-system	vpnkit-controller	0 (0%)	0 (0%)	0 (0%)	0 (0%)	10d

```

apiVersion: v1
kind: Node
metadata:
  annotations:
    kubeadm.alpha.kubernetes.io/cri-socket: unix:///var/run/cri-dockerd.sock
    node.alpha.kubernetes.io/ttl: "0"
    volumes.kubernetes.io/controller-managed-attach-detach: "true"
  creationTimestamp: "2022-06-11T17:18:45Z"
  labels:
    beta.kubernetes.io/arch: amd64
    beta.kubernetes.io/os: linux
    kubernetes.io/arch: amd64
    kubernetes.io/hostname: docker-desktop
    kubernetes.io/os: linux
    node-role.kubernetes.io/control-plane: ""
    node.kubernetes.io/exclude-from-external-load-balancers: ""
  name: docker-desktop
  resourceVersion: "465114"
  uid: d9a38207-0c3c-4ba7-bf58-1ceed2ffdd3c
spec: {}
status:
  addresses:
    - address: 192.168.65.4
      type: InternalIP
    - address: docker-desktop
      type: Hostname
  allocatable:
    cpu: "20"
    ephemeral-storage: "242541353378"
    hugepages-1Gi: "0"
    hugepages-2Mi: "0"
    memory: 52280588Ki
    pods: "110"
  capacity:
    cpu: "20"
    ephemeral-storage: 263174212Ki
    hugepages-1Gi: "0"
    hugepages-2Mi: "0"
    memory: 52382988Ki

```



```
nodeInfo:
  architecture: amd64
  bootID: 29ef0153-f41b-434b-86af-7be2f1260d8c
  containerRuntimeVersion: docker://20.10.16
  kernelVersion: 5.10.102.1-microsoft-standard-WSL2
  kubeProxyVersion: v1.24.0
  kubeletVersion: v1.24.0
  machineID: f572738f-ad78-4ffe-b9ba-e2d406999e3e
  operatingSystem: linux
  osImage: Docker Desktop
  systemUUID: f572738f-ad78-4ffe-b9ba-e2d406999e3e
```

```
top - 17:53:47 up 20:48, 0 users, load average: 0.20, 0.24, 0.25
Tasks: 10 total, 1 running, 9 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.3 us, 0.6 sy, 0.0 ni, 97.9 id, 0.0 wa, 0.0 hi, 0.1 si, 0.0 st
MiB Mem : 51155.3 total, 46595.1 free, 2129.5 used, 2430.6 buff/cache
MiB Swap: 13312.0 total, 13312.0 free, 0.0 used. 48497.8 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
8	root	20	0	896	88	20	S	0.3	0.0	0:00.22	init
1133	cloudme+	20	0	10872	3752	3204	R	0.3	0.0	0:00.02	top
1	root	20	0	904	540	464	S	0.0	0.0	0:00.01	init
7	root	20	0	896	88	20	S	0.0	0.0	0:00.00	init
9	cloudme+	20	0	10056	5068	3364	S	0.0	0.0	0:00.18	bash
524	root	20	0	904	96	20	S	0.0	0.0	0:00.00	init
525	root	20	0	904	96	20	S	0.0	0.0	0:00.00	init
526	root	20	0	1976028	30976	13600	S	0.0	0.1	0:02.12	docker-desktop-
543	root	20	0	904	96	20	S	0.0	0.0	0:00.00	init
544	cloudme+	20	0	766320	49652	30084	S	0.0	0.1	0:04.22	docker

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/sdc	251G	2.2G	237G	1%	/
tmpfs	25G	0	25G	0%	/mnt/wsl
tools	953G	319G	635G	34%	/init
none	25G	0	25G	0%	/dev
none	25G	12K	25G	1%	/run
none	25G	0	25G	0%	/run/lock
none	25G	0	25G	0%	/run/shm
none	25G	0	25G	0%	/run/user
tmpfs	25G	0	25G	0%	/sys/fs/cgroup
drivers	953G	319G	635G	34%	/usr/lib/wsl/drivers
lib	953G	319G	635G	34%	/usr/lib/wsl/lib
C:\	953G	319G	635G	34%	/mnt/c
/dev/sdd	251G	3.4G	235G	2%	/mnt/wsl/docker-desktop-data/isocache
none	25G	16K	25G	1%	/mnt/wsl/docker-desktop/shared-sockets/host-services
/dev/sdb	251G	121M	239G	1%	/mnt/wsl/docker-desktop/docker-desktop-user-distro
/dev/loop0	350M	350M	0	100%	/mnt/wsl/docker-desktop/cli-tools

NAME	READY	STATUS	RESTARTS	AGE
coredns-6d4b75cb6d-4h89j	1/1	Running	2 (2d4h ago)	9d
coredns-6d4b75cb6d-kj6cq	1/1	Running	2 (2d4h ago)	10d
etcd-docker-desktop	1/1	Running	2 (2d4h ago)	10d
kube-apiserver-docker-desktop	1/1	Running	2 (2d4h ago)	10d
kube-controller-manager-docker-desktop	1/1	Running	2 (2d4h ago)	10d
kube-flannel-ds-p7rhw	1/1	Running	0	5s
kube-proxy-9rfxs	1/1	Running	2 (2d4h ago)	10d
kube-scheduler-docker-desktop	1/1	Running	2 (2d4h ago)	10d
storage-provisioner	1/1	Running	4 (2d4h ago)	10d

NAME	STATUS	ROLES	AGE	VERSION	INTERNAL-IP
docker-desktop	Ready	control-plane	10d	v1.24.0	192.168.65.4

```

Name:      kube-proxy
Selector:  k8s-app=kube-proxy
Node-Selector:  kubernetes.io/os=linux
Labels:    k8s-app=kube-proxy
Annotations:  deprecated.daemonset.template.generation: 1
Desired Number of Nodes Scheduled: 1
Current Number of Nodes Scheduled: 1
Number of Nodes Scheduled with Up-to-date Pods: 1
Number of Nodes Scheduled with Available Pods: 1
Number of Nodes Misscheduled: 0
Pods Status:  1 Running / 0 Waiting / 0 Succeeded / 0 Failed
Pod Template:
  Labels:  k8s-app=kube-proxy
  Service Account:  kube-proxy
  Containers:
    kube-proxy:
      Image:  k8s.gcr.io/kube-proxy:v1.24.0
      Port:   <none>
      Host Port:  <none>
      Command:
        /usr/local/bin/kube-proxy
        --config=/var/lib/kube-proxy/config.conf
        --hostname-override=$(NODE_NAME)
  Environment:
    NODE_NAME:  (v1:spec.nodeName)
  Mounts:
    /lib/modules from lib-modules (ro)
    /run/xtables.lock from xtables-lock (rw)
    /var/lib/kube-proxy from kube-proxy (rw)
  Volumes:
    kube-proxy:
      Type:  ConfigMap (a volume populated by a ConfigMap)
      Name:  kube-proxy
      Optional:  false
    xtables-lock:
      Type:  HostPath (bare host directory volume)
      Path:  /run/xtables.lock
      HostPathType:  FileOrCreate
    lib-modules:
      Type:  HostPath (bare host directory volume)
      Path:  /lib/modules
      HostPathType:
  Priority Class Name:  system-node-critical
Events:  <none>

```

```

E0619 19:12:32.983236 1 proxier.go:657] "Failed to read builtin modules file, you can ignore this message when kube-proxy is ru
nning inside container without mounting /lib/modules" err="open /lib/modules/5.10.102.1-microsoft-standard-WSL2/modules.builtin: no s
uch file or directory" filePath="/lib/modules/5.10.102.1-microsoft-standard-WSL2/modules.builtin"
I0619 19:12:32.984728 1 proxier.go:667] "Failed to load kernel module with modprobe, you can ignore this message when kube-prox
y is running inside container without mounting /lib/modules" moduleName="ip_vs"
I0619 19:12:32.985952 1 proxier.go:667] "Failed to load kernel module with modprobe, you can ignore this message when kube-prox
y is running inside container without mounting /lib/modules" moduleName="ip_vs_rr"
I0619 19:12:32.987044 1 proxier.go:667] "Failed to load kernel module with modprobe, you can ignore this message when kube-prox
y is running inside container without mounting /lib/modules" moduleName="ip_vs_wrr"
I0619 19:12:32.988348 1 proxier.go:667] "Failed to load kernel module with modprobe, you can ignore this message when kube-prox
y is running inside container without mounting /lib/modules" moduleName="ip_vs_sh"
I0619 19:12:32.989398 1 proxier.go:667] "Failed to load kernel module with modprobe, you can ignore this message when kube-prox
y is running inside container without mounting /lib/modules" moduleName="nf_conntrack"
I0619 19:12:32.997581 1 node.go:163] Successfully retrieved node IP: 192.168.65.4
I0619 19:12:32.997625 1 server_others.go:138] "Detected node IP" address="192.168.65.4"
I0619 19:12:32.997657 1 server_others.go:578] "Unknown proxy mode, assuming iptables proxy" proxyMode=""
I0619 19:12:33.017568 1 server_others.go:296] "Using iptables Proxier"
I0619 19:12:33.017598 1 server_others.go:213] "kube-proxy running in dual-stack mode" ipFamily=IPv4
I0619 19:12:33.017604 1 server_others.go:214] "Creating dualStackProxier for iptables"
I0619 19:12:33.017608 1 server_others.go:485] "Detect-local-mode set to ClusterCIDR, but no cluster CIDR defined"
I0619 19:12:33.017612 1 server_others.go:541] "Defaulting to no-op detect-local" detect-local-mode="ClusterCIDR"
I0619 19:12:33.017628 1 proxier.go:259] "Setting route_localnet=1, use nodePortAddresses to filter loopback addresses for NodeP
orts to skip it https://issues.k8s.io/90259"
I0619 19:12:33.017763 1 proxier.go:259] "Setting route_localnet=1, use nodePortAddresses to filter loopback addresses for NodeP
orts to skip it https://issues.k8s.io/90259"
I0619 19:12:33.017941 1 server.go:661] "Version info" version="v1.24.0"
I0619 19:12:33.017960 1 server.go:663] "Golang settings" GOGC="" GOMAXPROCS="" GOTRACEBACK=""
I0619 19:12:33.018221 1 conntrack.go:100] "Set sysctl" entry="net/netfilter/nf_conntrack_tcp_timeout_close_wait" value=3600
I0619 19:12:33.018474 1 config.go:444] "Starting node config controller"
I0619 19:12:33.018515 1 shared_informer.go:255] Waiting for caches to sync for node config
I0619 19:12:33.018529 1 config.go:317] "Starting service config controller"
I0619 19:12:33.018543 1 shared_informer.go:255] Waiting for caches to sync for service config
I0619 19:12:33.018658 1 config.go:226] "Starting endpoint slice config controller"
I0619 19:12:33.018686 1 shared_informer.go:255] Waiting for caches to sync for endpoint slice config
I0619 19:12:33.118902 1 shared_informer.go:262] Caches are synced for endpoint slice config
I0619 19:12:33.118943 1 shared_informer.go:262] Caches are synced for service config
I0619 19:12:33.118911 1 shared_informer.go:262] Caches are synced for node config

```

```

● kubelet.service - kubelet: The Kubernetes Node Agent
   Loaded: loaded (/lib/systemd/system/kubelet.service; enabled; vendor preset: enabled)
   Drop-In: /etc/systemd/system/kubelet.service.d
            └─10-kubeadm.conf
   Active: active (running) since Wed 2022-06-22 00:31:05 UTC; 2min 22s ago
     Docs: https://kubernetes.io/docs/home/
    Main PID: 2289 (kubelet)
      Tasks: 16 (limit: 4612)
     Memory: 51.8M
    CGroup: /system.slice/kubelet.service
            └─2289 /usr/bin/kubelet --bootstrap-kubeconfig=/etc/kubernetes/bootstrap-kubelet.conf --kubeconfig=/etc/kuberne
Jun 22 00:31:31 controlplane kubelet[2289]: E0622 00:31:31.181809 2289 kubelet.go:2347] "Container runtime network not re
Jun 22 00:31:37 controlplane kubelet[2289]: I0622 00:31:37.131942 2289 topology_manager.go:200] "Topology Admit Handler"
Jun 22 00:31:37 controlplane kubelet[2289]: I0622 00:31:37.139860 2289 topology_manager.go:200] "Topology Admit Handler"
Jun 22 00:31:37 controlplane kubelet[2289]: I0622 00:31:37.240746 2289 reconciler.go:221] "operationExecutor.VerifyContro
Jun 22 00:31:37 controlplane kubelet[2289]: I0622 00:31:37.241158 2289 reconciler.go:221] "operationExecutor.VerifyContro
Jun 22 00:31:37 controlplane kubelet[2289]: I0622 00:31:37.241329 2289 reconciler.go:221] "operationExecutor.VerifyContro
Jun 22 00:31:37 controlplane kubelet[2289]: I0622 00:31:37.241491 2289 reconciler.go:221] "operationExecutor.VerifyContro
Jun 22 00:31:38 controlplane kubelet[2289]: E0622 00:31:38.496929 2289 kuberuntime_manager.go:1057] "PodSandboxStatus of >
Jun 22 00:31:40 controlplane kubelet[2289]: I0622 00:31:40.092051 2289 pod_container_deletor.go:79] "Container not found >
Jun 22 00:31:40 controlplane kubelet[2289]: I0622 00:31:40.115707 2289 pod_container_deletor.go:79] "Container not found >
Lines 1-22/22 (END)

```

```

kubelet.service - kubelet: The Kubernetes Node Agent
   Loaded: loaded (/lib/systemd/system/kubelet.service; enabled; vendor preset: enabled)
   Drop-In: /etc/systemd/system/kubelet.service.d
            └─10-kubeadm.conf
   Active: active (running) since Wed 2022-06-22 00:31:05 UTC; 6min ago
     Docs: https://kubernetes.io/docs/home/
    Main PID: 2289 (kubelet)
      Tasks: 16 (limit: 4612)
     Memory: 54.5M

```

```
-- Logs begin at Wed 2022-06-22 00:30:33 UTC, end at Wed 2022-06-22 00:35:11 UTC. --
Jun 22 00:30:37 host01 systemd[1]: Started kubelet: The Kubernetes Node Agent.
Jun 22 00:30:39 controlplane kubelet[863]: E0622 00:30:39.592428 863 server.go:205] "Failed to load kubelet config file"
Jun 22 00:30:39 controlplane systemd[1]: kubelet.service: Main process exited, code=exited, status=1/FAILURE
Jun 22 00:30:39 controlplane systemd[1]: kubelet.service: Failed with result 'exit-code'.
Jun 22 00:30:41 controlplane systemd[1]: Stopped kubelet: The Kubernetes Node Agent.
Jun 22 00:30:50 controlplane systemd[1]: Started kubelet: The Kubernetes Node Agent.
Jun 22 00:30:50 controlplane kubelet[1468]: Flag --network-plugin has been deprecated, will be removed along with dockershim.
Jun 22 00:30:50 controlplane kubelet[1468]: Flag --network-plugin has been deprecated, will be removed along with dockershim.
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.059517 1468 server.go:446] "Kubelet version" kubeletVersion="v1.22.0"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.060309 1468 server.go:874] "Client rotation is on, will bootstrap"
Jun 22 00:30:51 controlplane kubelet[1468]: E0622 00:30:51.088871 1468 certificate_manager.go:471] kubernetes.io/kube-api
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.089365 1468 dynamic_cafile_content.go:156] "Starting controller"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.160243 1468 server.go:693] "--cgroups-per-qos enabled, but --cgroup-driver=systemd"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.160676 1468 container_manager_linux.go:281] "Container manager initialized"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.161443 1468 container_manager_linux.go:286] "Creating ContainerManager"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.162440 1468 topology_manager.go:133] "Creating topology manager"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.162460 1468 container_manager_linux.go:321] "Creating device plugin"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.165014 1468 state_mem.go:36] "Initialized new in-memory state"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.166366 1468 kubelet.go:313] "Using dockershim is deprecated, please use containerd or cri"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.168693 1468 client.go:80] "Connecting to docker on the docker daemon"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.168741 1468 client.go:99] "Start docker client with request timeout"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.182659 1468 docker_service.go:571] "Hairpin mode is set but kubelet is not using hairpin mode"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.192744 1468 docker_service.go:243] "Hairpin mode is set" hairpinMode
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.193003 1468 cni.go:240] "Unable to update cni config" err="no such file or directory"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.195283 1468 cni.go:240] "Unable to update cni config" err="no such file or directory"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.185416 1468 docker_service.go:258] "Docker cri networking manager initialized"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.185585 1468 cni.go:240] "Unable to update cni config" err="no such file or directory"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.193297 1468 docker_service.go:264] "Docker Info" dockerInfo="{"Config": {"Auth": {"Auth": "REDACTED"}, "Features": {"Experimental": true}, "Plugins": {"Authorization": "REDACTED", "Image": "REDACTED", "Network": "REDACTED", "Volume": "REDACTED"}, "Version": "20.10.17"}, "ID": "REDACTED", "KernelVersion": "5.10.0-22-amd64", "OperatingSystem": "Ubuntu 22.04 LTS", "Architecture": "amd64", "OSType": "linux"}"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.193330 1468 docker_service.go:279] "Setting cgroupDriver" cgroupDriver="systemd"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.216388 1468 kubelet.go:416] "Attempting to sync node with API"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.216421 1468 kubelet.go:278] "Adding static pod path" path="/etc/kubernetes/manifests"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.216477 1468 kubelet.go:289] "Adding apiserver pod source"
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.216508 1468 apiserver.go:42] "Waiting for node sync before watching"
Jun 22 00:30:51 controlplane kubelet[1468]: W0622 00:30:51.235161 1468 reflector.go:324] k8s.io/client-go/informers/factory: failed to watch: http: no such host
Jun 22 00:30:51 controlplane kubelet[1468]: E0622 00:30:51.237684 1468 reflector.go:138] k8s.io/client-go/informers/factory: failed to watch: http: no such host
Jun 22 00:30:51 controlplane kubelet[1468]: W0622 00:30:51.240097 1468 reflector.go:324] k8s.io/client-go/informers/factory: failed to watch: http: no such host
Jun 22 00:30:51 controlplane kubelet[1468]: E0622 00:30:51.240182 1468 reflector.go:138] k8s.io/client-go/informers/factory: failed to watch: http: no such host
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.250132 1468 kubernetemanager.go:248] "Container runtime initialized"
Jun 22 00:30:51 controlplane kubelet[1468]: W0622 00:30:51.250999 1468 probe.go:268] Flexvolume plugin directory at /usr/libexec/kubernetes/kubelet-plugins/volume/exec/nodefs~exec~storage is not found
Jun 22 00:30:51 controlplane kubelet[1468]: I0622 00:30:51.252848 1468 server.go:1231] "Started kubelet"
```

```
Jun 22 00:30:37 host01 systemd[1]: Started kubelet: The Kubernetes Node Agent.
Jun 22 00:30:39 controlplane kubelet[863]: E0622 00:30:39.592428 863 server.go:205] "Failed to load kubelet config file"
Jun 22 00:30:39 controlplane systemd[1]: kubelet.service: Main process exited, code=exited, status=1/FAILURE
Jun 22 00:30:39 controlplane systemd[1]: kubelet.service: Failed with result 'exit-code'.
```

NAMESPACE	NAME	READY	STATUS	RESTARTS	AGE
app	old-busybox	0/1	ImagePullBackOff	0	2m54s
default	busybox	0/1	ImagePullBackOff	0	5m22s
default	nginx	1/1	Running	2 (3d7h ago)	10d
default	nginx-v2	1/1	Running	2 (3d7h ago)	10d
default	old-busybox	0/1	ImagePullBackOff	0	4m19s
default	test	1/1	Running	3 (3d7h ago)	10d
kube-system	coredns-6d4b75cb6d-4h89j	1/1	Running	2 (3d7h ago)	10d
kube-system	coredns-6d4b75cb6d-kj6cq	1/1	Running	2 (3d7h ago)	11d
kube-system	etcd-docker-desktop	1/1	Running	2 (3d7h ago)	11d
kube-system	kube-apiserver-docker-desktop	1/1	Running	2 (3d7h ago)	11d
kube-system	kube-controller-manager-docker-desktop	1/1	Running	2 (3d7h ago)	11d
kube-system	kube-flannel-ds-p7rhw	0/1	CrashLoopBackOff	327 (113s ago)	27h
kube-system	kube-proxy-9rfxs	1/1	Running	2 (3d7h ago)	11d
kube-system	kube-scheduler-docker-desktop	1/1	Running	2 (3d7h ago)	11d
kube-system	storage-provisioner	1/1	Running	4 (3d7h ago)	11d
kube-system	vpnkit-controller	1/1	Running	906 (2m56s ago)	11d

LAST SEEN	TYPE	REASON	OBJECT	MESSAGE
89s	Normal	Killing	pod/nginx-8f458dc5b-p74rr	Stopping container nginx
89s	Warning	FailedKillPod	pod/nginx-8f458dc5b-p74rr	error killing pod: failed to "KillContainer" for "nginx" with KillContainerError: "rpc error: code = Unknown desc = Error response from daemon: No such container: b1f1e1318f8470f958506a2a4909b677e282e65f36a8bc0223ec9eacbb820db4"
89s	Normal	Killing	pod/nginx-8f458dc5b-v8j74	Stopping container nginx
89s	Warning	FailedKillPod	pod/nginx-8f458dc5b-v8j74	error killing pod: failed to "KillContainer" for "nginx" with KillContainerError: "rpc error: code = Unknown desc = Error response from daemon: No such container: b94ddacd8fa6b35e3ce66907ce32e4924b297d0ffacf2d1d872d18e09f73c4c"
17s	Normal	Killing	pod/webfront-app-5c474b5bcc-nsvtt	Stopping container nginx
17s	Normal	Killing	pod/webfront-app-5c474b5bcc-zrwq2	Stopping container nginx



LAST SEEN	TYPE	REASON	OBJECT	MESSAGE
16m	Normal	Pulled	pod/vpnkit-controller	Container image "docker/desktop-vpnkit-controller:v2.0" already present on machine
24m	Normal	Created	pod/vpnkit-controller	Created container vpnkit-controller
24m	Normal	Started	pod/vpnkit-controller	Started container vpnkit-controller
16m	Warning	BackOff	pod/vpnkit-controller	Back-off restarting failed container
51s	Warning	BackOff	pod/kube-flannel-ds-p7rhw	Back-off restarting failed container
35m	Normal	Pulled	pod/kube-flannel-ds-p7rhw	Container image "rancher/mirrored-flannelcni-flannel:v0.18.1" already present on machine

LAST SEEN	TYPE	REASON	OBJECT	MESSAGE
9e54s	Normal	Scheduled	pod/old-busybox	Successfully assigned app/old-busybox to docker-desktop
8e24s	Normal	Pulling	pod/old-busybox	Pulling image "busybox:1.11"
8e24s	Warning	Failed	pod/old-busybox	Failed to pull image "busybox:1.11": rpc error: code = Unknown desc = Error response from daemon: manifest for busybox:1.11 not found: manifest unknown: manifest unknown
8e24s	Warning	Failed	pod/old-busybox	Error: ErrImagePull
4e45s	Normal	BackOff	pod/old-busybox	Back-off pulling image "busybox:1.11"
7e58s	Warning	Failed	pod/old-busybox	Error: ImagePullBackOff

NAME	READY	STATUS	RESTARTS	AGE
old-busybox	0/1	ErrImagePull	0	106s

Name:	old-busybox			
Namespace:	app			
Priority:	0			
Node:	docker-desktop/192.168.65.4			
Start Time:	Wed, 22 Jun 2022 19:51:56 -0700			
Labels:	runold-busybox			
Annotations:	<none>			
Status:	Pending			
IP:	10.1.0.64			
IPs:	IP: 10.1.0.64			
Containers:				
old-busybox:				
Container ID:	---			
Image:	busybox:1.11			
Image ID:	---			
Port:	<none>			
Host Port:	<none>			
State:	Waiting			
Reason:	ImagePullBackOff			
Ready:	False			
Restart Count:	0			
Environment:	<none>			
Mounts:				
/var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-vhmg1 (ro)				
Conditions:				
Type	Status			
Initialized	True			
Ready	False			
ContainersReady	False			
PodScheduled	True			
Volumes:				
kube-api-access-vhmg1:				
Type:	Projected (a volume that contains injected data from multiple sources)			
TokenExpirationSeconds:	3607			
ConfigMapName:	kube-root-ca.crt			
ConfigMapOptional:	<nil>			
DownwardAPI:	true			
QoS Class:	BestEffort			
Node-Selectors:	<none>			
Tolerations:	node.kubernetes.io/not-ready:NoExecute op=Exists for 300s node.kubernetes.io/unreachable:NoExecute op=Exists for 300s			
Events:				
Type	Reason	Age	From	Message
Normal	Scheduled	19m	default-scheduler	Successfully assigned app/old-busybox to docker-desktop
Normal	Pulling	17m (x4 over 19m)	kubelet	Pulling image "busybox:1.11"
Warning	Failed	17m (x4 over 19m)	kubelet	Failed to pull image "busybox:1.11": rpc error: code = Unknown desc = Error response from daemon: manifest for busybox:1.11 not found: manifest unknown: manifest unknown
Warning	Failed	17m (x4 over 19m)	kubelet	Error: ErrImagePull
Warning	Failed	17m (x6 over 19m)	kubelet	Error: ImagePullBackOff
Normal	BackOff	4m10s (x64 over 19m)	kubelet	Back-off pulling image "busybox:1.11"

Events:				
Type	Reason	Age	From	Message
Normal	Scheduled	19m	default-scheduler	Successfully assigned app/old-busybox to docker-desktop
Normal	Pulling	17m (x4 over 19m)	kubelet	Pulling image "busybox:1.11"
Warning	Failed	17m (x4 over 19m)	kubelet	Failed to pull image "busybox:1.11": rpc error: code = Unknown desc = Error response from daemon: manifest for busybox:1.11 not found: manifest unknown: manifest unknown
Warning	Failed	17m (x4 over 19m)	kubelet	Error: ErrImagePull
Warning	Failed	17m (x6 over 19m)	kubelet	Error: ImagePullBackOff
Normal	BackOff	4m10s (x64 over 19m)	kubelet	Back-off pulling image "busybox:1.11"

```

apiVersion: v1
kind: Pod
metadata:
  creationTimestamp: "2022-06-23T03:33:40Z"
  labels:
    run: old-busybox
  name: old-busybox
  namespace: app
  resourceVersion: "812513"
  uid: c853b2ba-2f7e-4d26-806c-21d3ee7d6952
spec:
  containers:
    - image: busybox:1.11
      imagePullPolicy: IfNotPresent
      name: old-busybox
      resources: {}
      terminationMessagePath: /dev/termination-log
      terminationMessagePolicy: File
      volumeMounts:
        - mountPath: /var/run/secrets/kubernetes.io/serviceaccount
          name: kube-api-access-bkgmk
          readOnly: true
  dnsPolicy: ClusterFirst
  enableServiceLinks: true
  nodeName: docker-desktop
  preemptionPolicy: PreemptLowerPriority
  priority: 0
  restartPolicy: Always
  schedulerName: default-scheduler
  securityContext: {}
  serviceAccount: default
  serviceAccountName: default
  terminationGracePeriodSeconds: 30

```

```

apiVersion: v1
kind: Pod
metadata:
  creationTimestamp: "2022-06-23T03:33:40Z"
  labels:
    run: old-busybox
  name: old-busybox
  namespace: app
  resourceVersion: "812513"
  uid: c853b2ba-2f7e-4d26-806c-21d3ee7d6952
spec:
  containers:
    - image: busybox:latest
      imagePullPolicy: IfNotPresent
      name: old-busybox
      resources: {}
      terminationMessagePath: /dev/termination-log
      terminationMessagePolicy: File

```

## Chapter 10: Troubleshooting Security and Networking

```
🔔 Unable to pick a default driver. Here is what was considered, in preference order:
  ▪ docker: Not healthy: "docker version --format {{.Server.Os}}-{{.Server.Version}}" exit status 1:
  ▪ docker: Suggestion: <https://minikube.sigs.k8s.io/docs/drivers/docker/>
🔔 Alternatively you could install one of these drivers:
  ▪ kvm2: Not installed: exec: "virsh": executable file not found in $PATH
  ▪ podman: Not installed: exec: "podman": executable file not found in $PATH
  ▪ vmware: Not installed: exec: "docker-machine-driver-vmware": executable file not found in $PATH
  ▪ virtualbox: Not installed: unable to find VBoxManage in $PATH
  ▪ qemu2: Not installed: exec: "qemu-system-x86_64": executable file not found in $PATH
❌ Exiting due to DRV_NOT_HEALTHY: Found driver(s) but none were healthy. See above for suggestions how to fix installed drivers.
```

```
cloudmelon@cloudmelonsrv:~$ sudo minikube start --driver=docker
🐳 minikube v1.24.0 on Ubuntu 18.04
✨ Using the docker driver based on user configuration
🚫 The "docker" driver should not be used with root privileges.
🔔 If you are running minikube within a VM, consider using --driver=none:
   https://minikube.sigs.k8s.io/docs/reference/drivers/none/
❌ Exiting due to DRV_AS_ROOT: The "docker" driver should not be used with root privileges.
```

```
🐳 minikube v1.25.2 on Ubuntu 22.04
🔔 minikube 1.26.0 is available! Download it: https://github.com/kubernetes/minikube/releases/tag/v1.26.0
🔔 To disable this notice, run: 'minikube config set WantUpdateNotification false'

✨ Using the docker driver based on existing profile
👉 Starting control plane node minikube in cluster minikube
📡 Pulling base image ...
🔄 Restarting existing docker container for "minikube" ...
❗ This container is having trouble accessing https://k8s.gcr.io
🔔 To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
📡 Preparing Kubernetes v1.23.3 on Docker 20.10.12 ...
  ▪ kubelet.housekeeping-interval=5m
🔍 Verifying Kubernetes components...
  ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟 Enabled addons: storage-provisioner, default-storageclass
🏠 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

```

Name:                coredns
Namespace:           kube-system
CreationTimestamp:    Mon, 14 Mar 2022 00:25:33 +0000
Labels:              k8s-app=kube-dns
Annotations:         deployment.kubernetes.io/revision: 1
Selector:             k8s-app=kube-dns
Replicas:            1 desired | 1 updated | 1 total | 1 available | 0 unavailable
StrategyType:        RollingUpdate
MinReadySeconds:     0
RollingUpdateStrategy: 1 max unavailable, 25% max surge
Pod Template:
  Labels:             k8s-app=kube-dns
  Service Account:    coredns
  Containers:
    coredns:
      Image:           k8s.gcr.io/coredns/coredns:v1.8.6
      Ports:           53/UDP, 53/TCP, 9153/TCP
      Host Ports:      0/UDP, 0/TCP, 0/TCP
      Args:
        -conf
        /etc/coredns/Corefile
      Limits:
        memory: 170Mi
      Requests:
        cpu:        100m
        memory:     70Mi
      Liveness:      http-get http://:8080/health delay=60s timeout=5s period=10s #success=1 #failure=5
      Readiness:     http-get http://:8181/ready delay=0s timeout=1s period=10s #success=1 #failure=3
      Environment:   <none>
      Mounts:
        /etc/coredns from config-volume (ro)
  Volumes:
    config-volume:
      Type:          ConfigMap (a volume populated by a ConfigMap)
      Name:          coredns
      Optional:      false
      Priority Class Name: system-cluster-critical
Conditions:
  Type            Status  Reason
  ----            -
  Available       True    MinimumReplicasAvailable
  Progressing     True    NewReplicaSetAvailable
OldReplicaSets:   <none>
NewReplicaSet:    coredns-64897985d (1/1 replicas created)
Events:           <none>

```

```

[INFO] plugin/ready: Still waiting on: "kubernetes"
[INFO] plugin/ready: Still waiting on: "kubernetes"
[INFO] plugin/ready: Still waiting on: "kubernetes"
[WARNING] plugin/kubernetes: starting server with unsynced Kubernetes API
.:53
[INFO] plugin/reload: Running configuration MD5 = cec3c60eb1cc4909fd4579a8d79ea031
CoreDNS-1.8.6
linux/arm64, go1.17.1, 13a9191
[INFO] plugin/ready: Still waiting on: "kubernetes"
[INFO] plugin/ready: Still waiting on: "kubernetes"

```

```

cloudmelon@cloudmelonplayground:~$ kubectl get svc -n app
NAME          TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
nginx-svc     NodePort    10.101.34.154 <none>         80:32242/TCP     83s

```

```

cloudmelon@cloudmelonplayground:~$ kubectl get svc nginx-svc -n app -o wide
NAME          TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE    SELECTOR
nginx-svc     NodePort    10.101.34.154 <none>         80:32242/TCP     2m42s  app=svc-nginx

```



```
Server:      10.96.0.10
Address:     10.96.0.10:53

154.34.101.10.in-addr.arpa      name = nginx-svc.app.svc.cluster.local

pod "sandbox" deleted
```

If you don't see a command prompt, try pressing enter.

```
HTTP/1.1 200 OK
Server: nginx/1.23.0
Date: Sun, 26 Jun 2022 22:40:05 GMT
Content-Type: text/html
Content-Length: 615
Last-Modified: Tue, 21 Jun 2022 14:25:37 GMT
Connection: keep-alive
ETag: "62b1d4e1-267"
Accept-Ranges: bytes

pod "nginx-beta" deleted
```

```
/ # whoami
root
/ # nslookup 10.101.34.154
Server:      10.96.0.10
Address:     10.96.0.10:53

154.34.101.10.in-addr.arpa      name = nginx-svc.app.svc.cluster.local
```