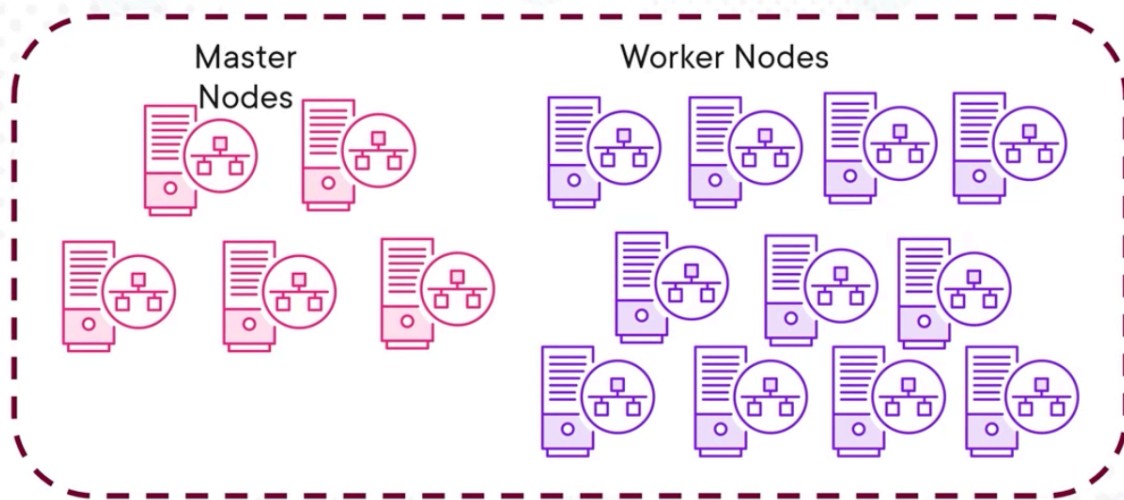


# Kubernetes Basic Concepts and Configuration

## Cluster

The collection of nodes that make up a given Kubernetes deployment, centrally managed.

### Cluster Architecture



Always a odd number of **Master Nodes**!

Worker nodes should be no longer than **5000**!

## Kubernetes Hosting Options

Self Managed : I manage the cluster

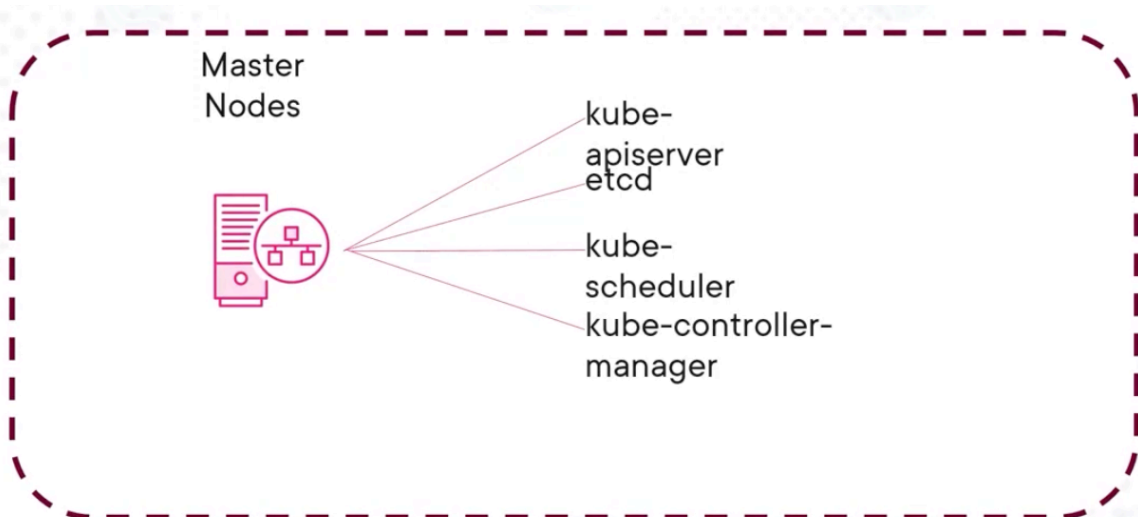
Managed Cluster : I operate on the cluster

Kaas - Kubernetes as a Service: I only deploy Apps to the service

## Node

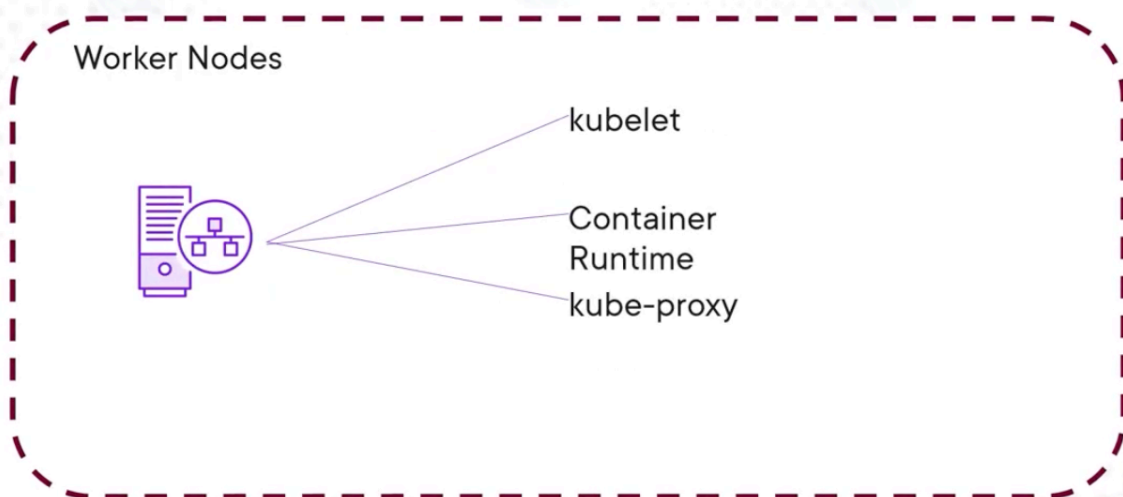
A physical or virtual machine

## Master Node



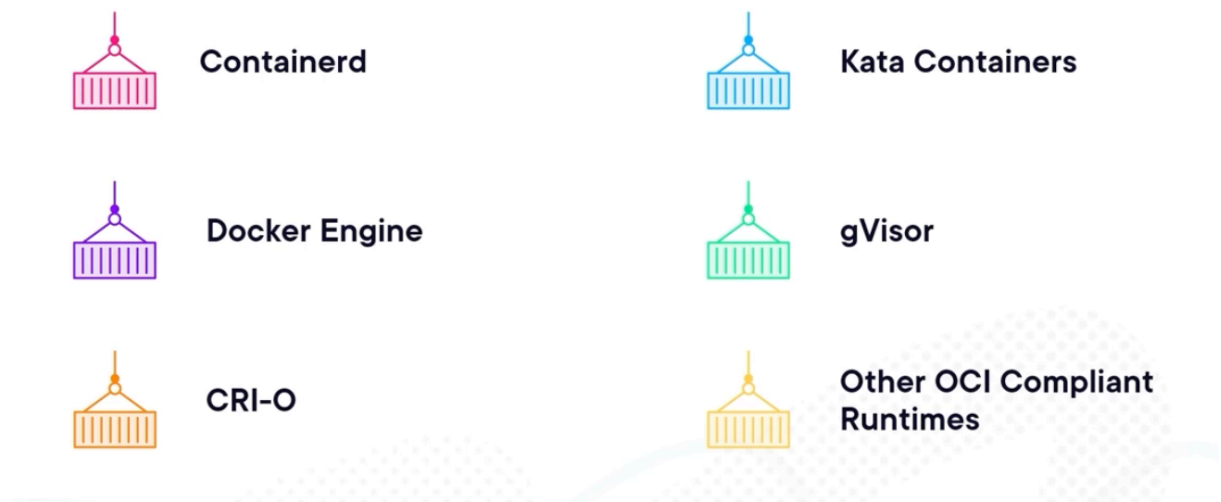
## Worker Node

### Worker Nodes



## Containers Runtime

## Available Container Runtime



## Pods

A collection of one or more containers that share resources.

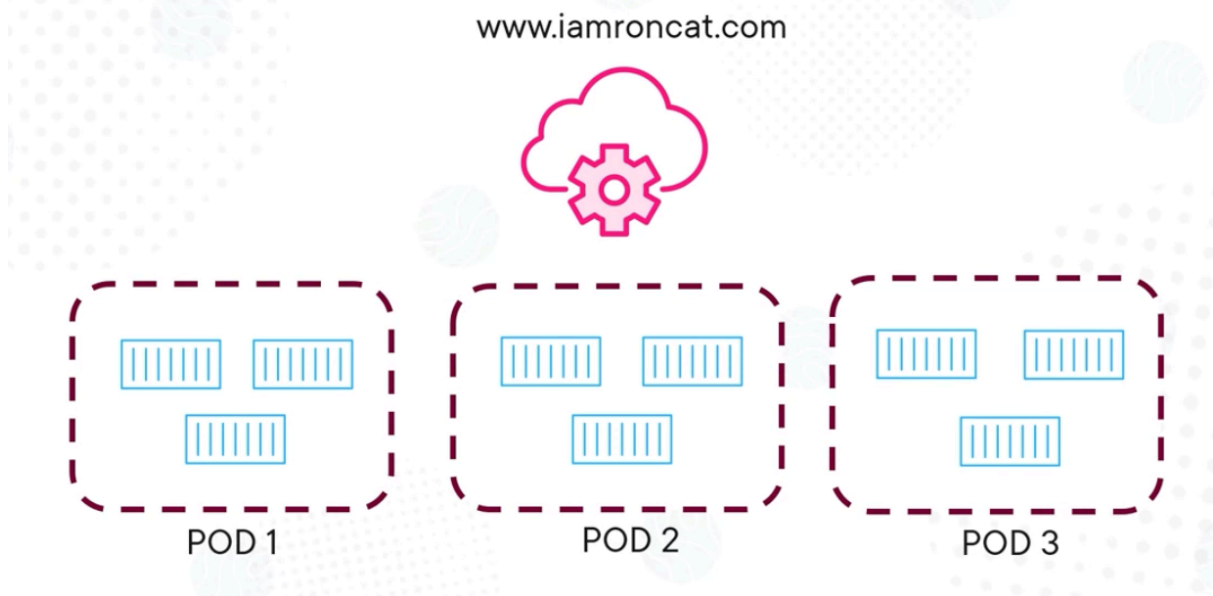
## Scheduler

Assigns new pods to nodes based on resource requirements of the pods and constraints of the cluster.

## Service

An abstraction of the underlying resources used to provide a single endpoint for a given application, api or function.

## Service



## Deployment

Declarative management of applications, defining the configuration of a given service or app.

### Key aspects of a Deployment

- Desired state configuration (config of the pods)
- ReplicaSet Management (Identical pods available in the deployment)
- Automated Rollouts and Rollbacks (No downtime)
- Scaling
- Self-Healing

There are pods that run containers that runs the service/cluster itself!

## Manifest

A yaml file that describes the desired state of an application, and deployment configurations.

# Example Manifest File

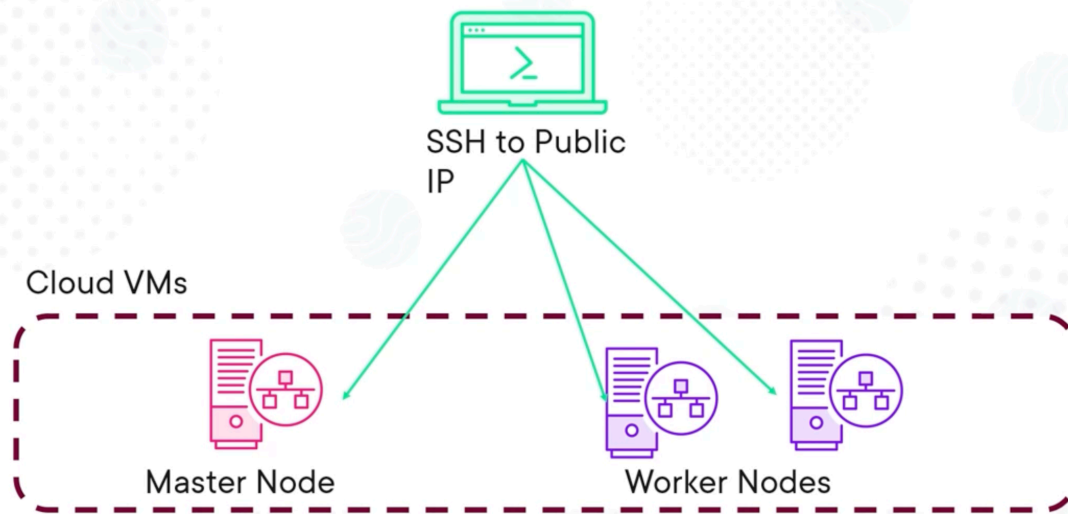
yaml

```
apiVersion: apps/v1
kind: Deployment
Metadata:
  name: my-app-deployment
Spec:
  replicas: 3
  selector:
    matchLabels:
      app: my-app
  template:
    metadata:
      labels:
        app: my-app
    spec:
      containers:
        - name: my-app-container
          image: my-docker-repo/my-app-image:latest
          ports:
            - containerPort: 8080
```

## Kubernetes Installation & Configuration

### Cluster Infrastructure

## Cluster Infrastructure



Use SSH to log into the VMs

Production Resource Requirements

- 2 CPU
- 4GM RAM
- 40GB+