Kubernetes :- (K8s)

=> └> Container Manager / Orchestrator

$\boxed{C_1}$ $\boxed{C_2}$ $\boxed{C_3}$
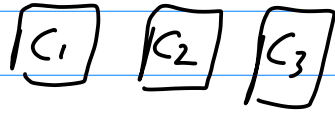
=> Developed by Google => 2014

Why we Need Kubernetes?

=> Microservices are highly dynamic in nature.

=> Microservices Complexities

- We need Automation
  - Automatic Scheduling
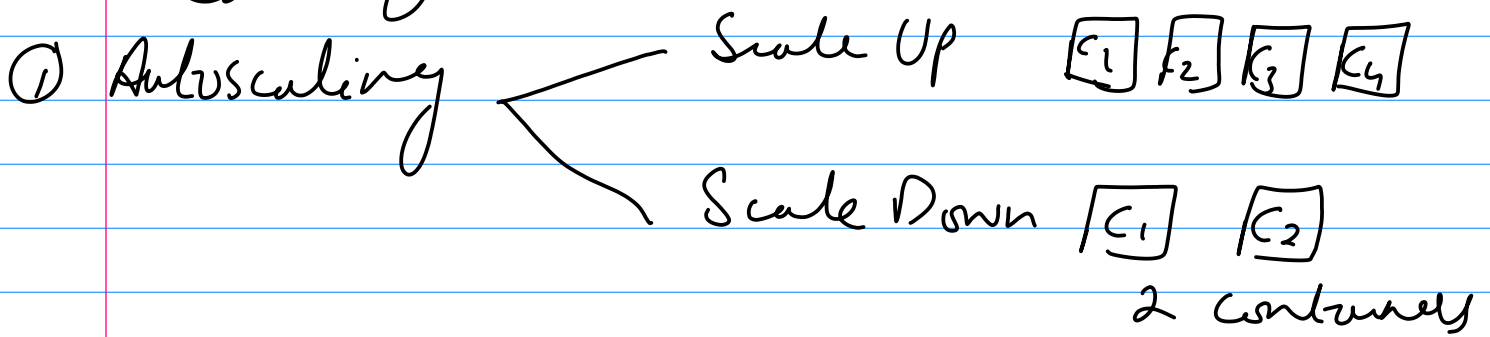 - Automatic Configuration
  - Supervision
  - Failure Handling

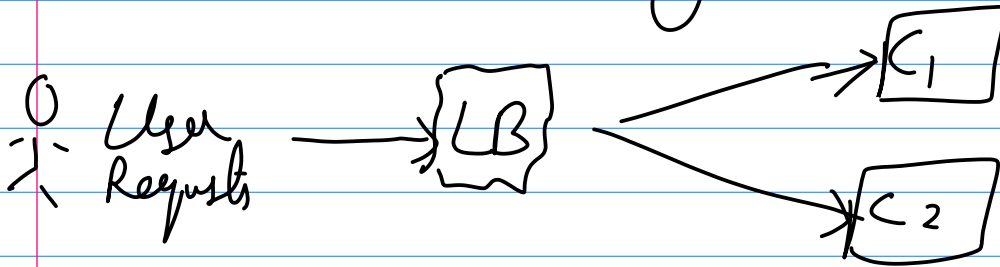This is where kubernetes comes in.

Kubernetes will help us

- to manage large scale applications
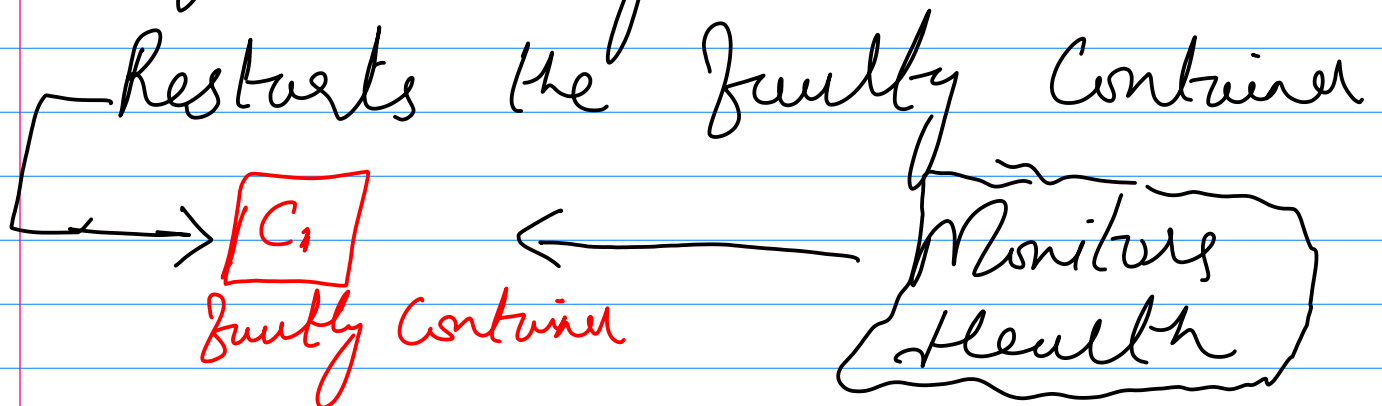
Benefits Of Kubernetes :-

① Autoscaling → Scale UP

4 Containers

C_1 F_2 K_3 K_4

Scale Down C_1 C_2

2 Containers

② Load Balancing

O
⅄ User
Requests → LB → C_1
              → C_2

③ Self Healing

Restarts the faulty Container

→ C_1 ← ⟵ Monitors Health

faulty Container

If container is not responding
or any other fault exist..
kubernetes will restart it.

(9) Scheduling :-

⟹ We can Schedule tasks.
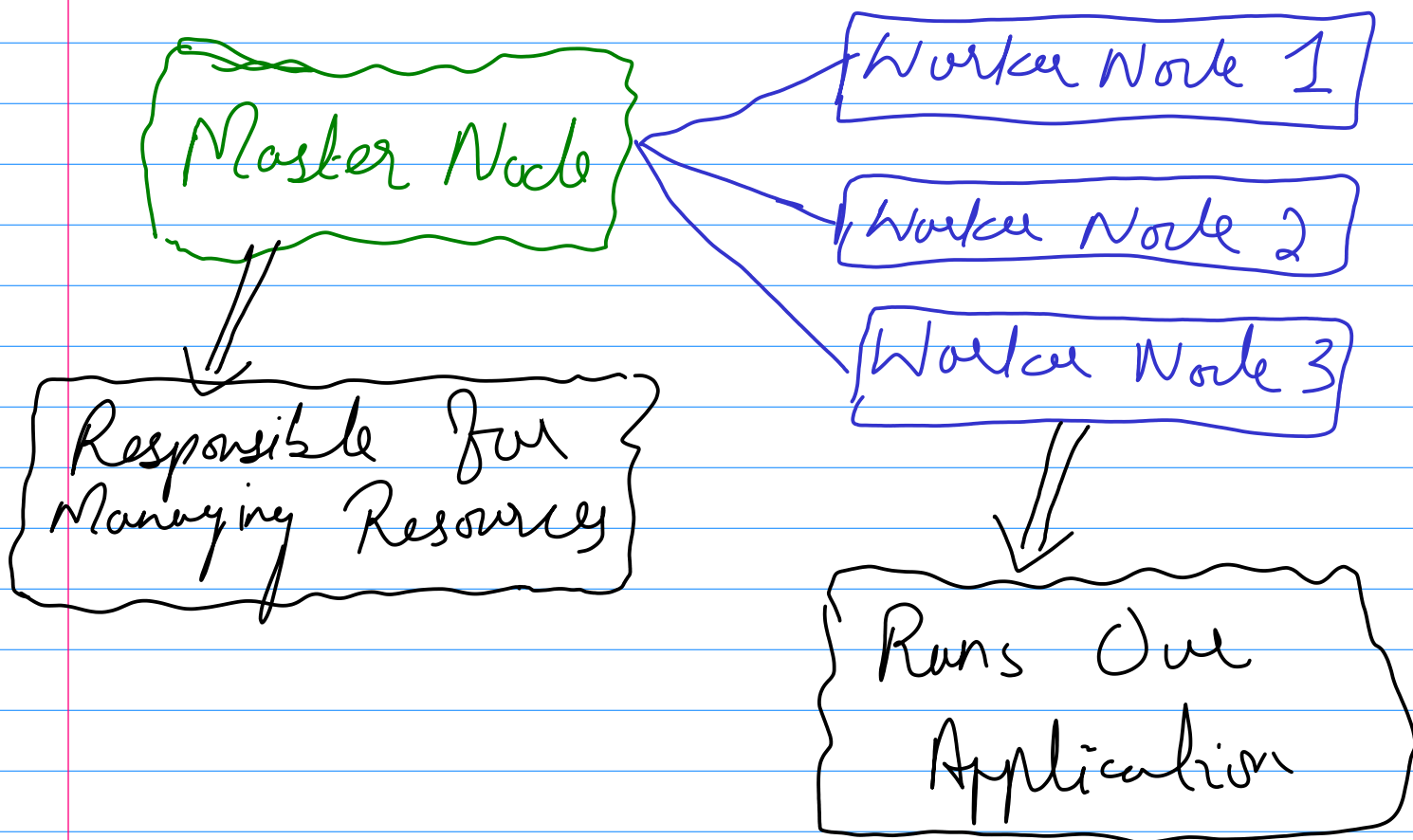
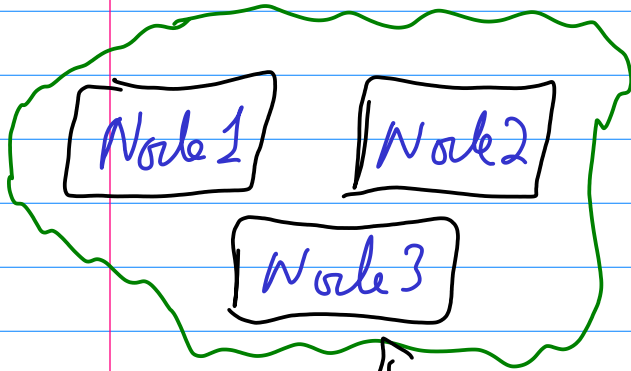   Backups ⟹ 11 pm

It will automatically take
backups at 11 am.

Kubernetes Architecture
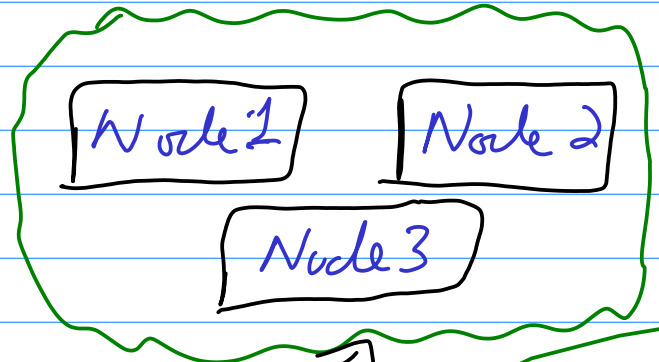Abstract View

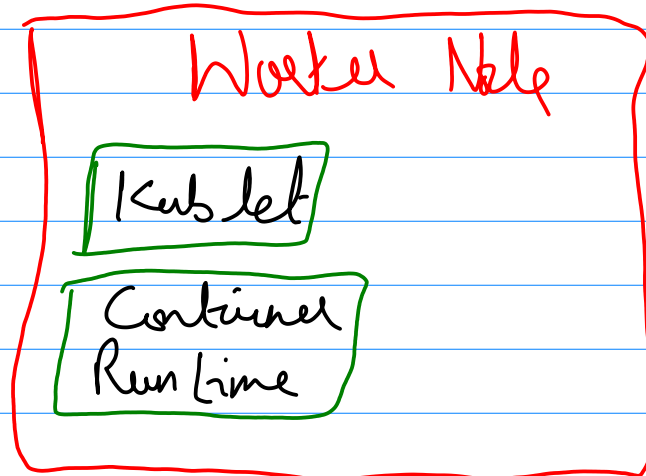Master Node → Worker Node 1
Worker Node 2
Worker Node 3

Responsible for
Managing Resources

Runs Our
Application

Kubernetes Cluster :

Cluster 1   Cluster 2

| Node1 | Node2 | | Node1 | Node 2 |
| Node3 | | Node3 |

Worker Nodes

Detailed View Of K8S Architecture

Master

| etcd | Api Server |

| Scheduler | Controller Manager |

Worker Node
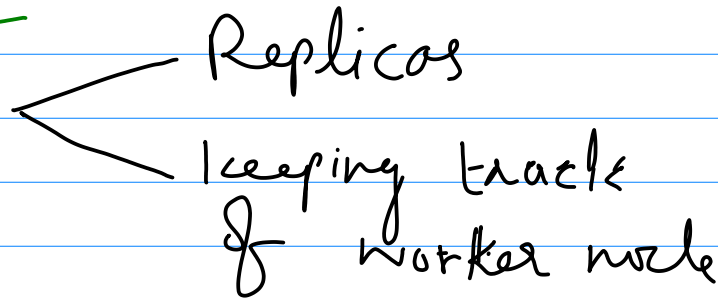
| Kublet |

| Container Run time |
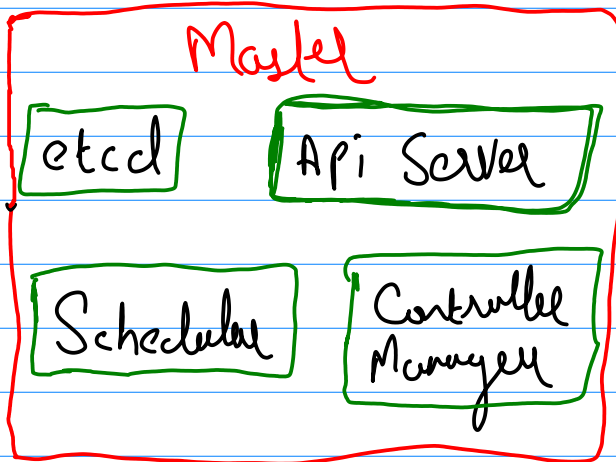
Master Node

Scheduler :-

- Distributing containers across multiple nodes

- It looks for newly created containers & assign to nodes

- Resources Utilization
    - CPU
    - Memory

Controller Manager :-

- Orchestration ⟹ Replicas
                     keeping track of worker node

- Noticing when container goes down

etcd

Data Store ⟹ To Manage Clusters

API Server :

- Acts as a front-end for kubernetes
- CLI talks to API Server.

Worker Node

Container Runtime

- underline software to run containers

Kublet:

- Agent that runs on each node of a cluster
- Responsible to make sure that the containers are running on nodes us expected.

Required Tools for Running Kubernetes

=> ① Dockers

--> ② Minikube

--> ③ kubectl

- Command line Interface
- Interpret our commands

1 Master Node

1 Worker Node

Single Cluster

What we will study in K8's = ??

① PODS
② Replicas
③ Jobs & Cron Jobs
④ Service
⑤ Probes (Liveness & Rediness)
⑥ Volumes & Config Maps
⑦ Deployments
⑧ Horizontal Pod Autoscaling
⑨ EKS

aws => elastic kubernetes service