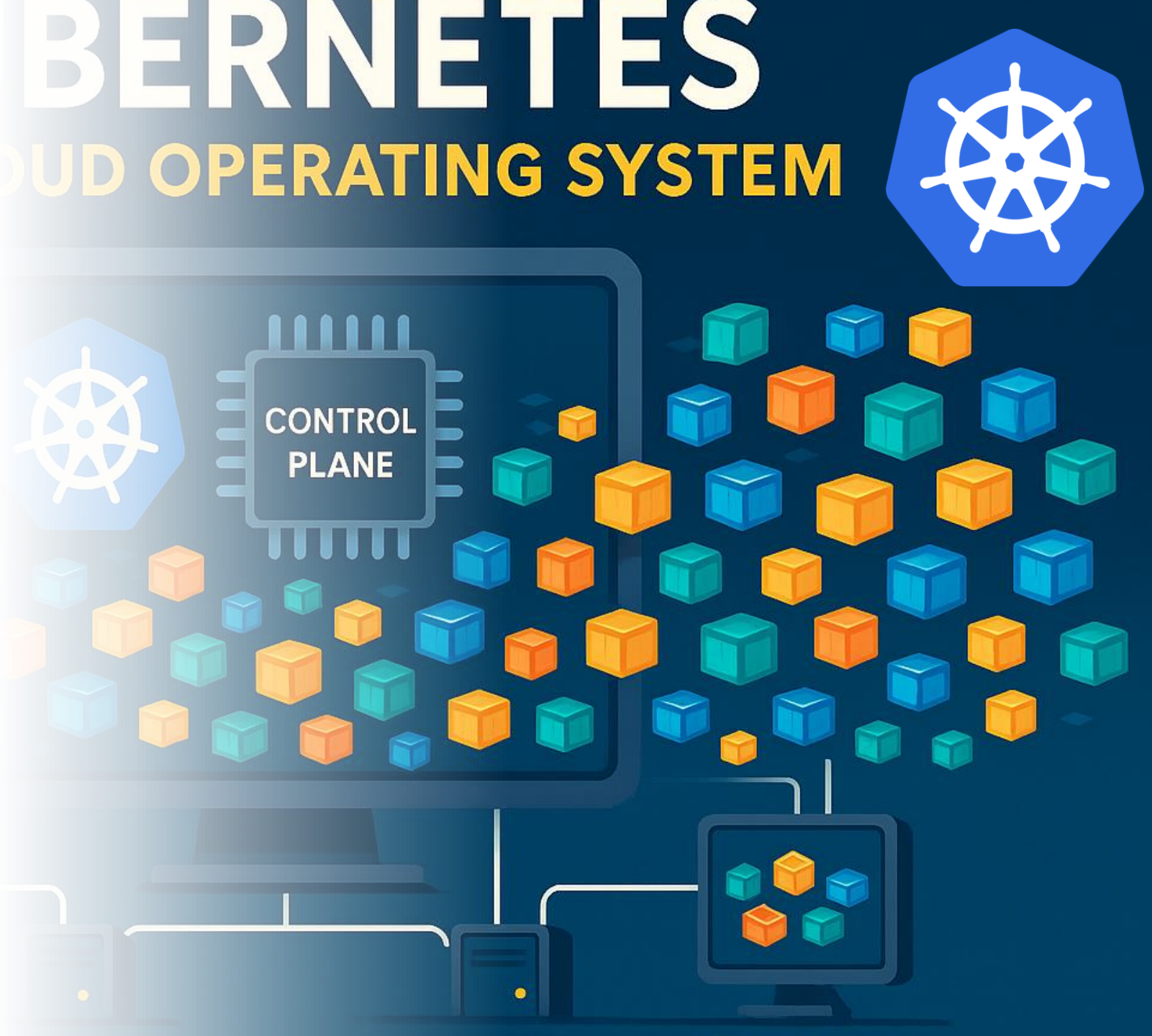
CS-UY 3913
Container
Operating Systems

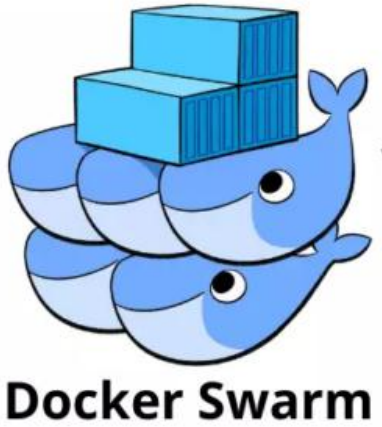
Docker Swarm



Instructor: Magdy Salem

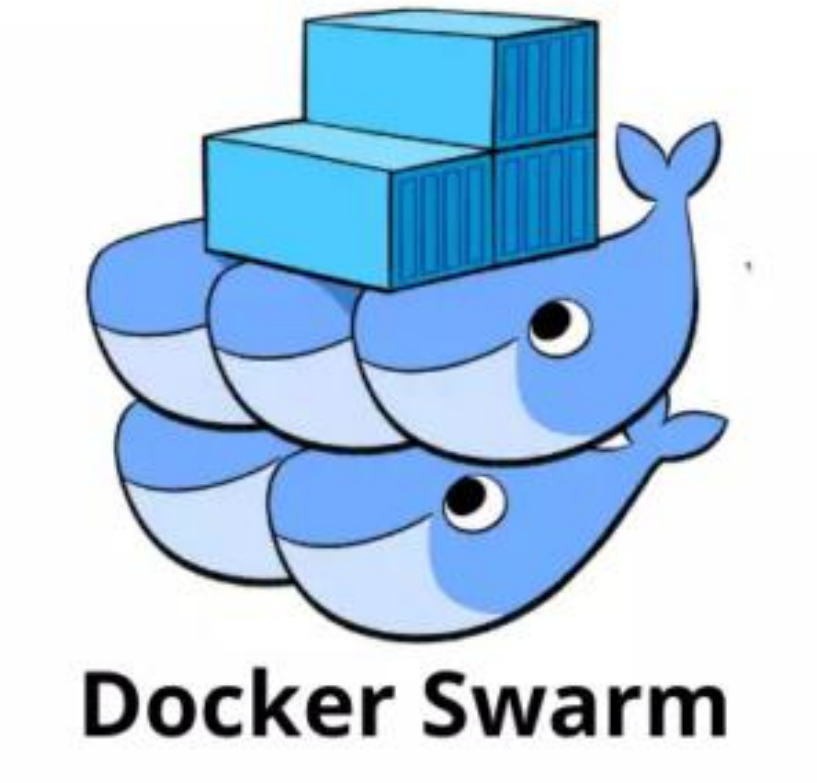
Agenda

- Introduction to Docker Swarm
- Cluster setup and deployment
- Networking, secrets, and configs
- Best practices and limitations
- Demo
- Lab



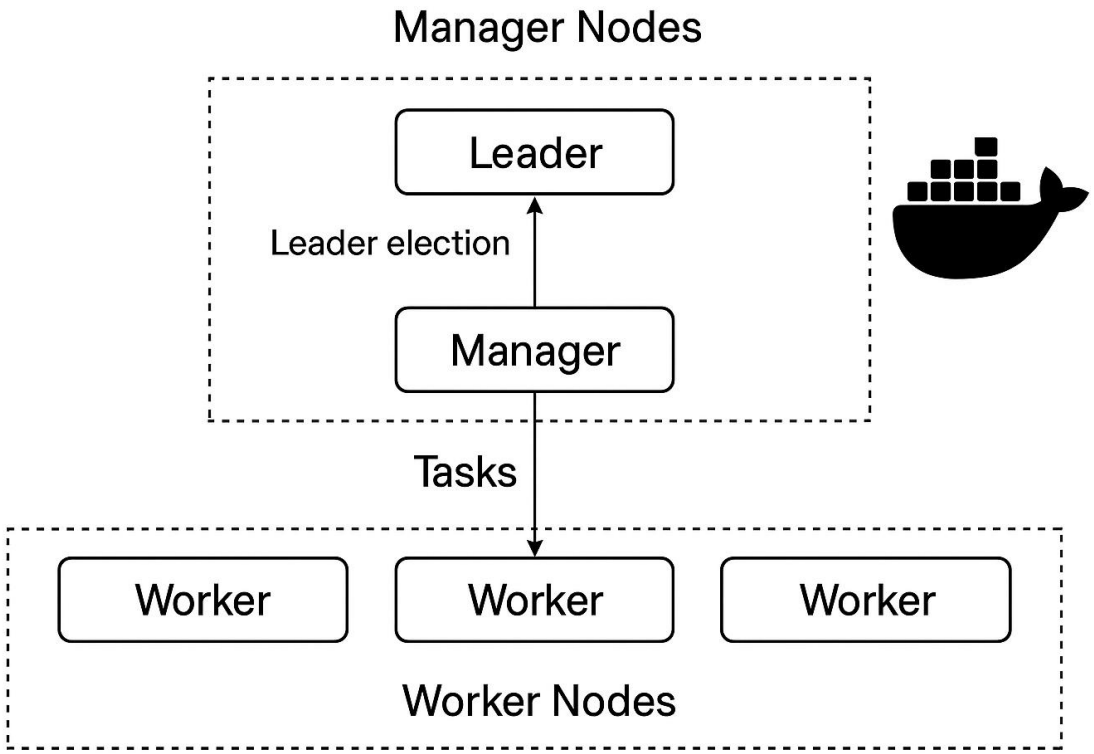
Docker Swarm

- What is Docker Swarm?
- Why use Swarm: built-in orchestration
- Alternatives: Swarm vs Kubernetes



Swarm Architecture

- Managers and workers
- How nodes communicate
- Leader election Raft protocol



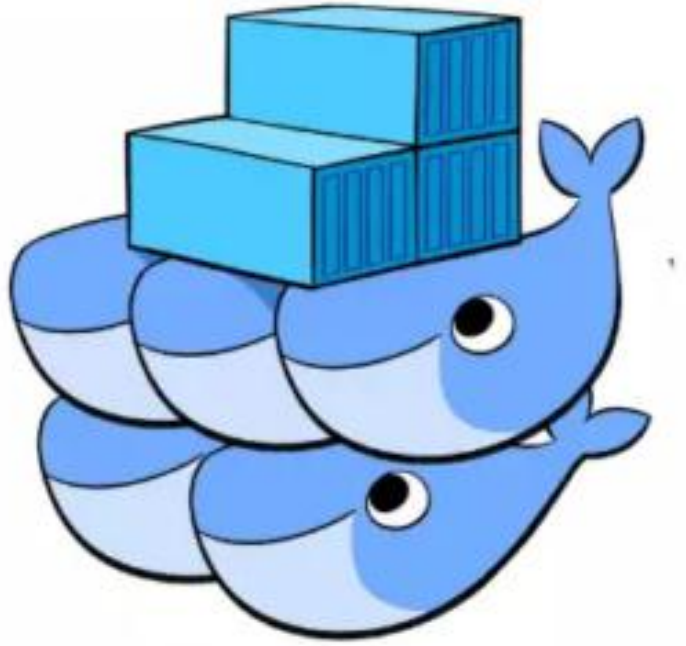
Setting Up a Swarm Cluster

- `docker swarm init`
- `docker swarm join`

  docker swarm join --token <token> <manager-ip>:2377
- Token-based node joining
- Node roles and management

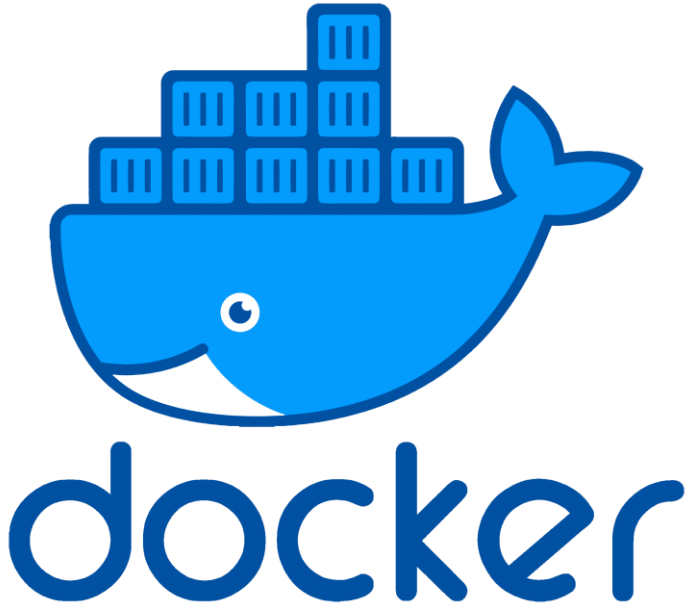
  docker node promote <node-id>

  docker node demote <node-id>



Networking in Swarm

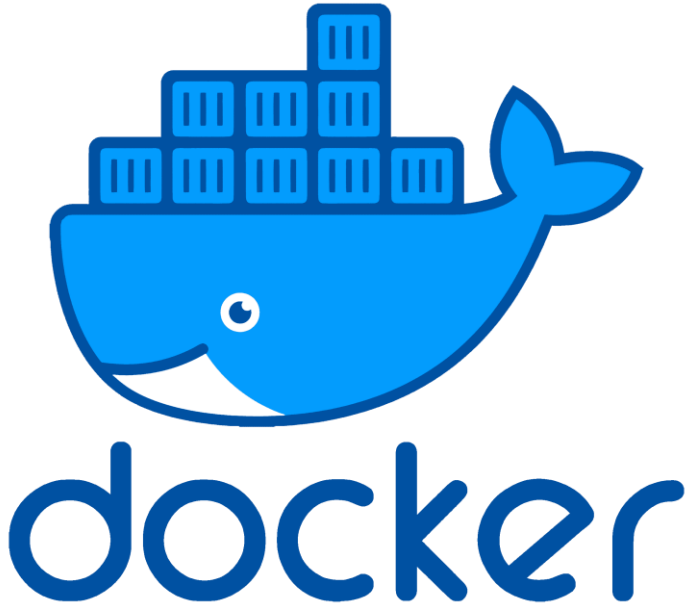
- Overlay networks
- Service discovery and DNS
- Load balancing between tasks



Secrets and Configs

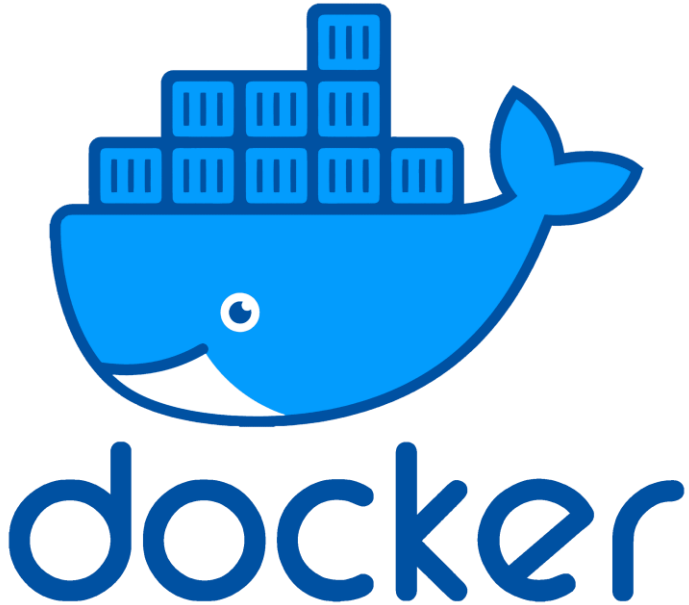
- Storing sensitive data in secrets
- `docker secret create`
- `docker config create`
- Mounting into services securely

```
docker service create \
  --name myapp \
  --secret db_password \
  myimage:latest
```



Best Practices and Limitations

- Keep quorum with odd number of managers
- Secure communication (mutual TLS)
- Limitations vs Kubernetes (community,extensibility)



Demo

LAB

Lab Github link here