Cluster Setup and Management

Installation and Management

kubernetes

SoftUni Team

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Have a Question?

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#Kubernetes

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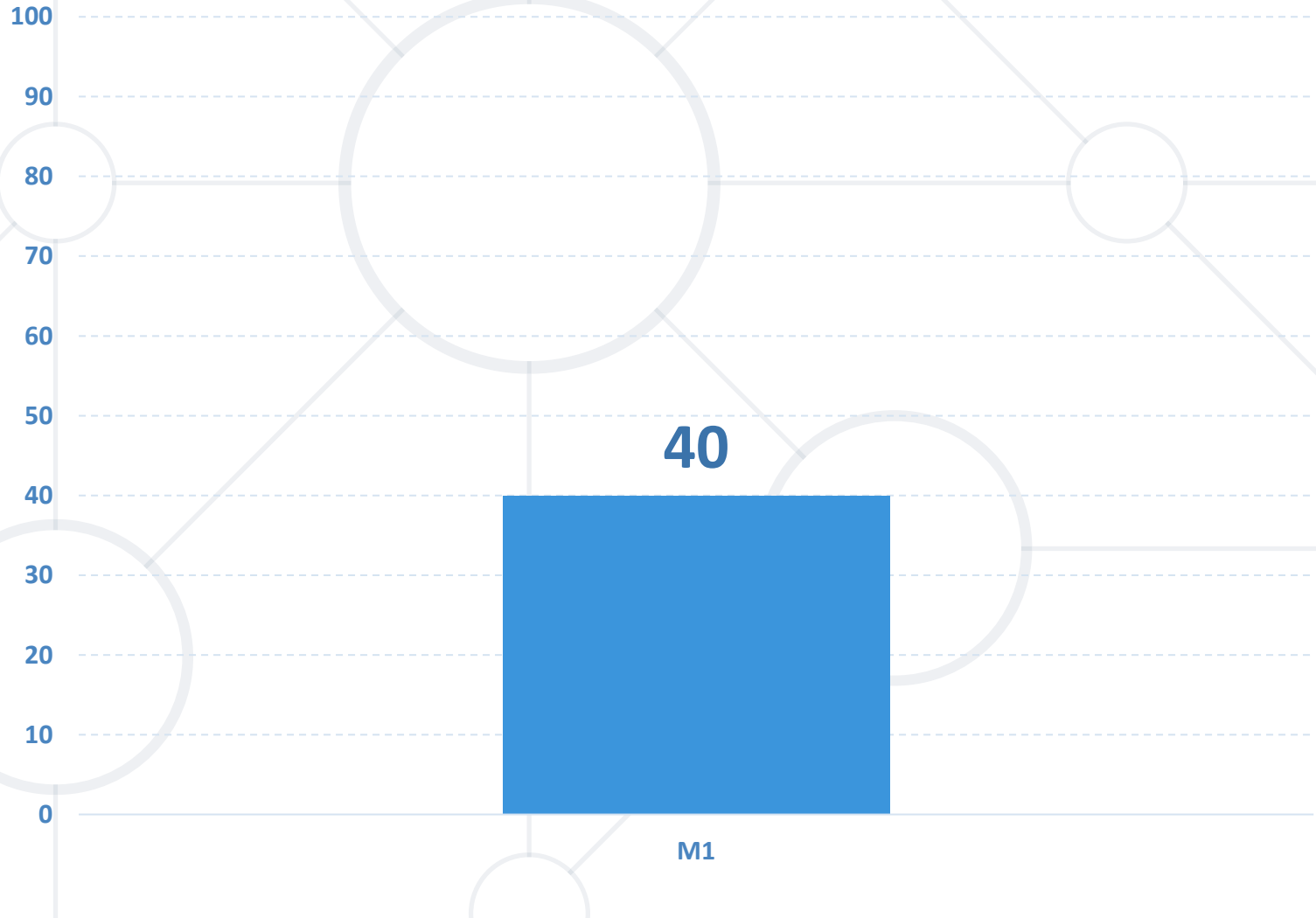
Homework Progress



Submit M1
until 23:59:59
on 23.10.2023

Submit M2
until 23:59:59
on 30.10.2023

Previous Module (M1)

Quick overview

Table of Contents

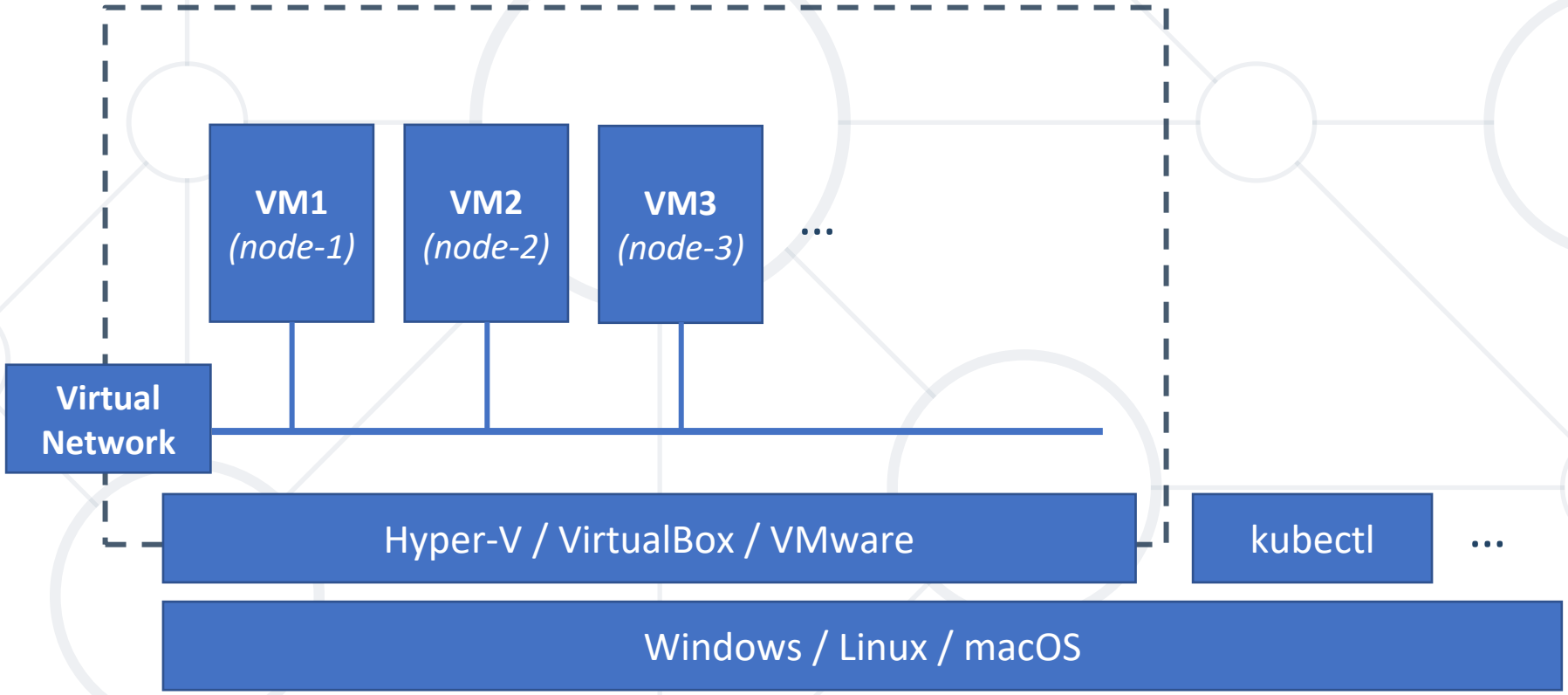
1. Containerization and Orchestration
2. Kubernetes Architecture and API
3. Basic Tools
4. Basic Objects

This Module (M2)

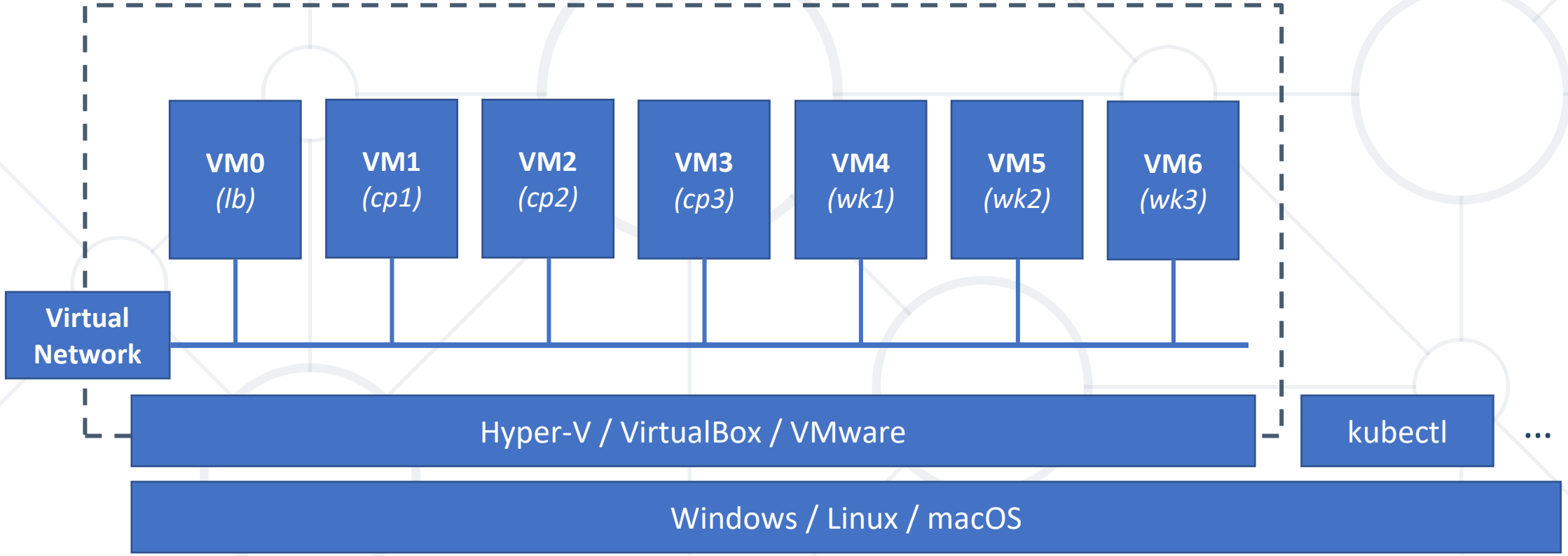
Table of Contents

1. Basic Cluster Installation
2. Manage and Upgrade Kubernetes Cluster
3. Highly-available Kubernetes Cluster

Lab Infrastructure (part 1 & 2)



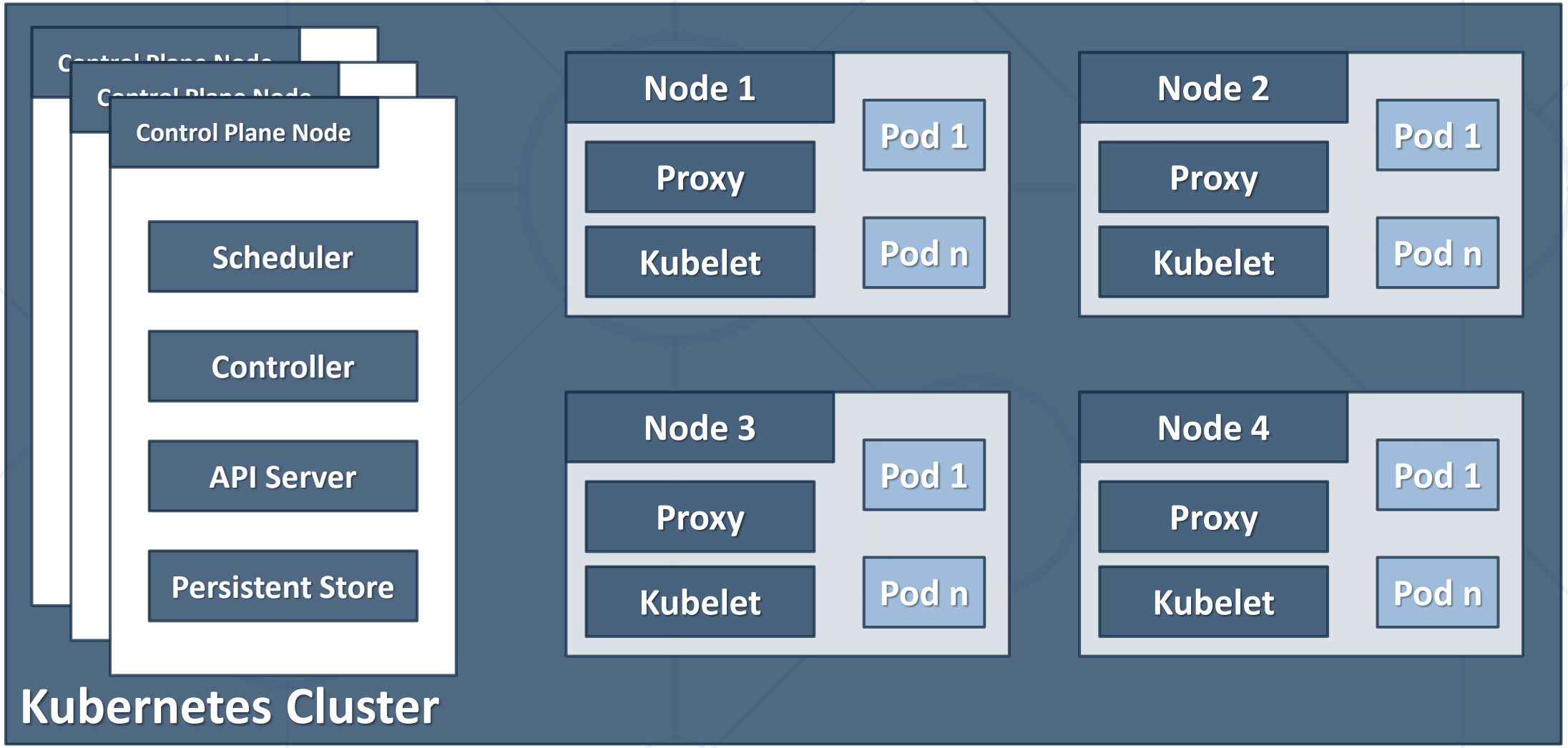
Lab Infrastructure (part 3)



Basic Cluster Installation

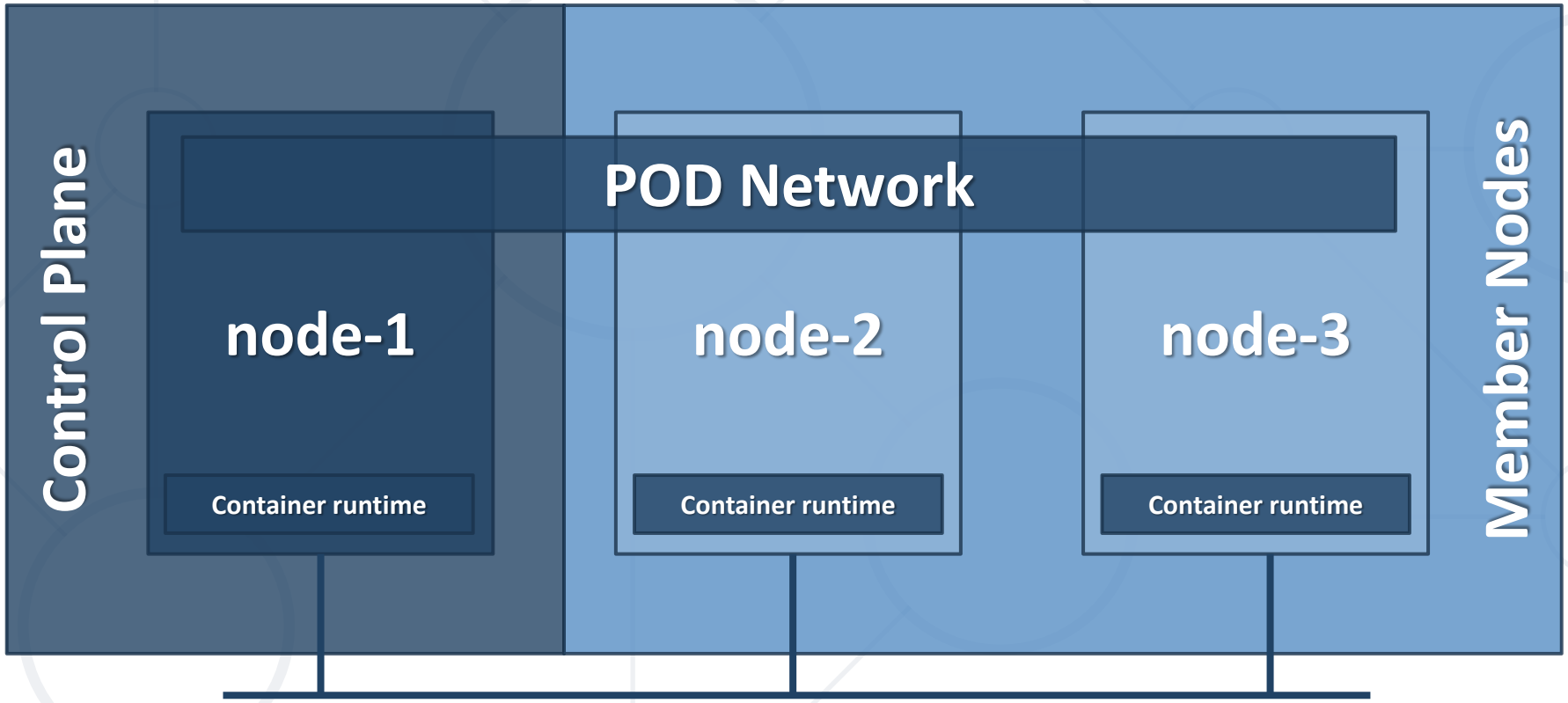
The semi-hard way

Architecture Overview *



* Not all components are shown

What Will We Install? *



* + other components that will be installed both explicitly and implicitly

How Will We Do It?

- Prepare a golden image
- Create the infrastructure
- Initialize the Control Plane
- Join the other nodes
- Work with our new cluster

Practice

Live Exercise in Class (Lab)

Manage and Upgrade k8s Cluster

Node Maintenance

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- Make the node unavailable for new work (**cordon**)
- Initiate workload migration (**drain**)
- All pods are **evicted** and recreated on other nodes
- Node is ready for maintenance
- Declare the node ready for accepting work (**uncordon**)

Cluster State Backup/Restore

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- **etcd** is the default database for storing the cluster state
- It runs on the control plane node(s)
- Use the **etcdctl** command to control it

Cluster Upgrade

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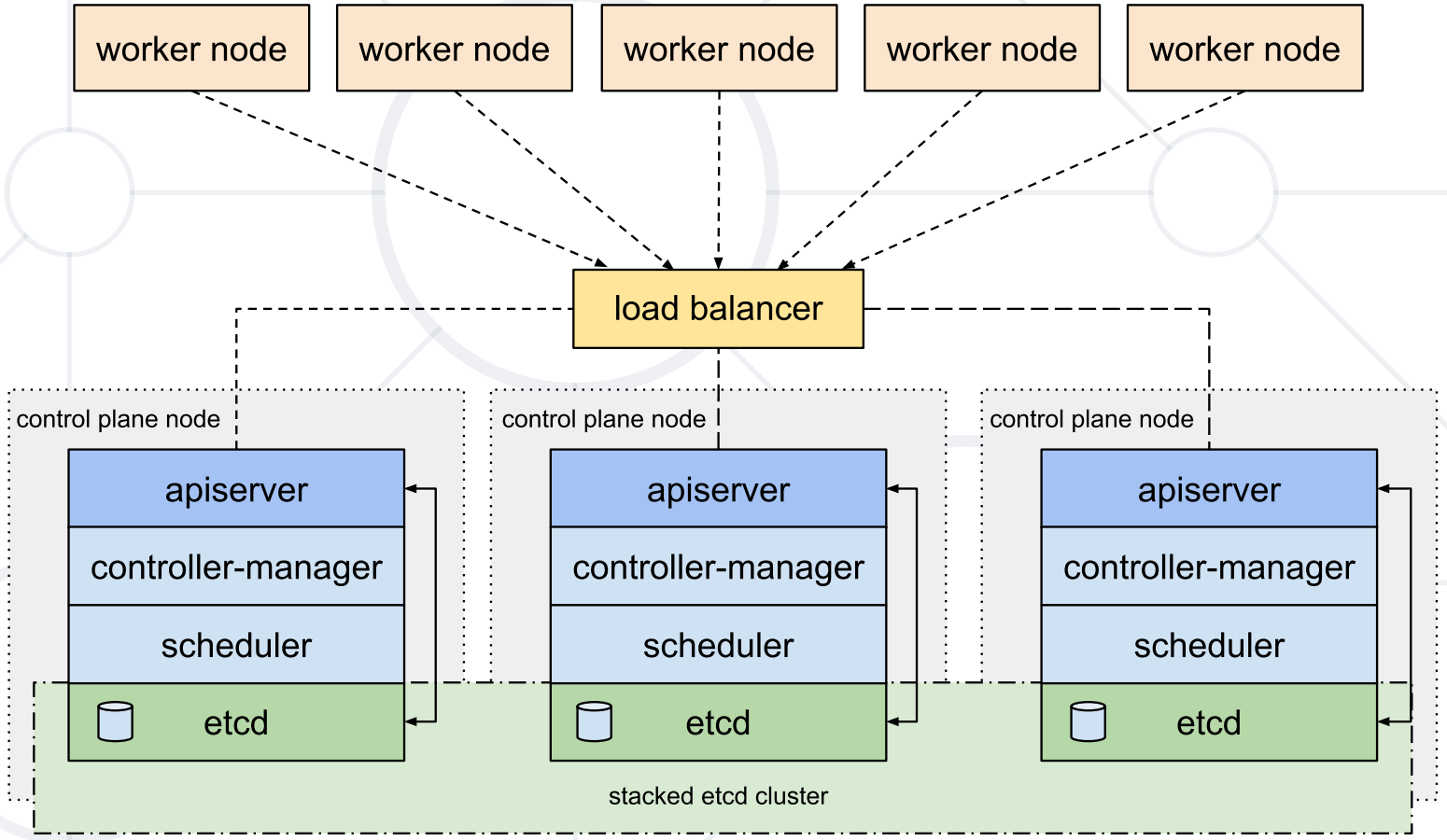
- Control plane nodes (one by one)
  - Upgrade kubeadm
  - Upgrade the node
  - Drain the node
  - Upgrade the other components
  - Uncordon the node
- Nodes (one by one)
  - Same approach as with the control plane nodes

Practice

Live Exercise in Class (Lab)

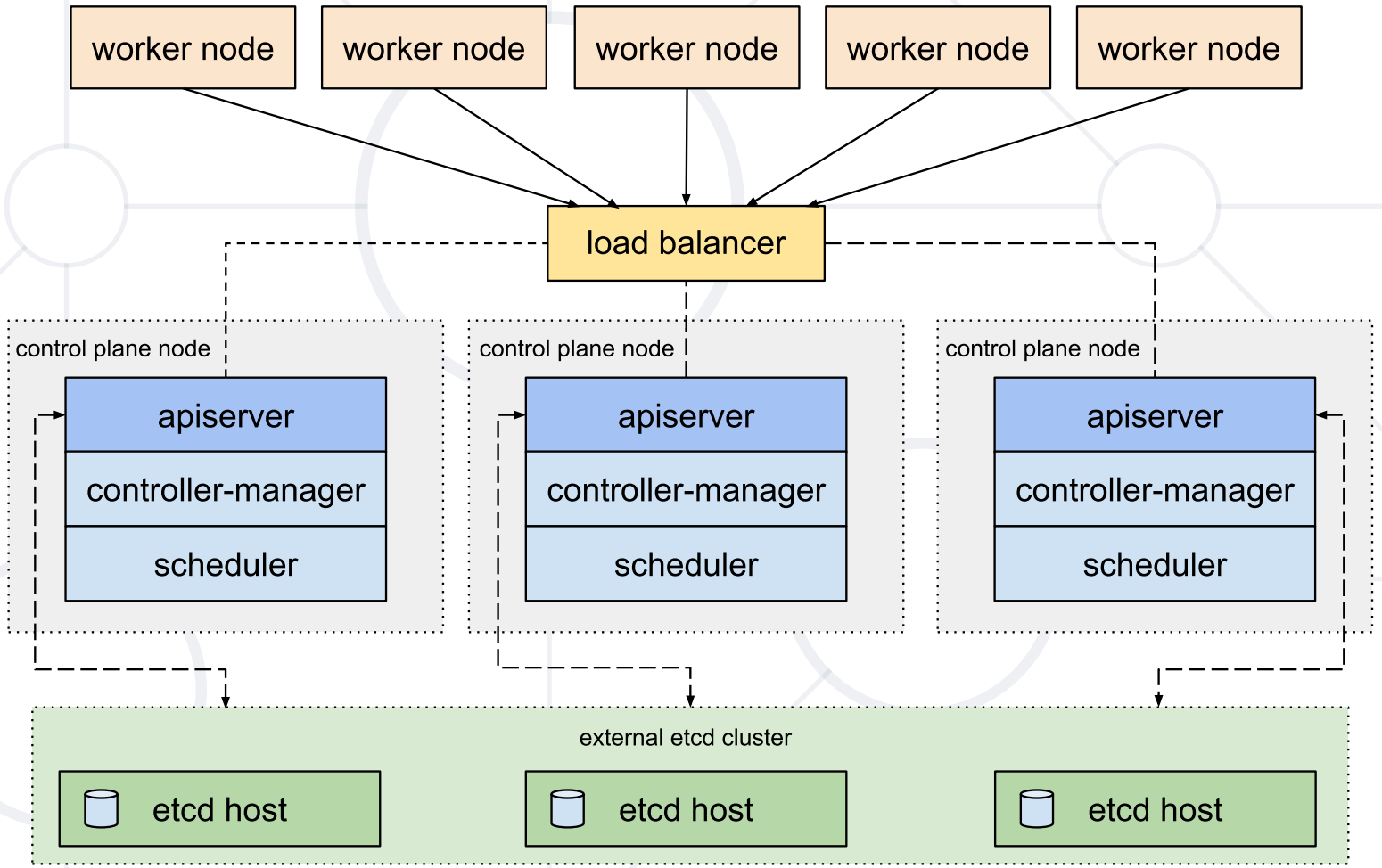
Highly-available k8s Cluster

Option 1 (stacked etcd)



https://kubernetes.io/docs/setup/production-environment/tools/kubeadm/ha-topology/#stacked-etcd-topology

Option 2 (external etcd)

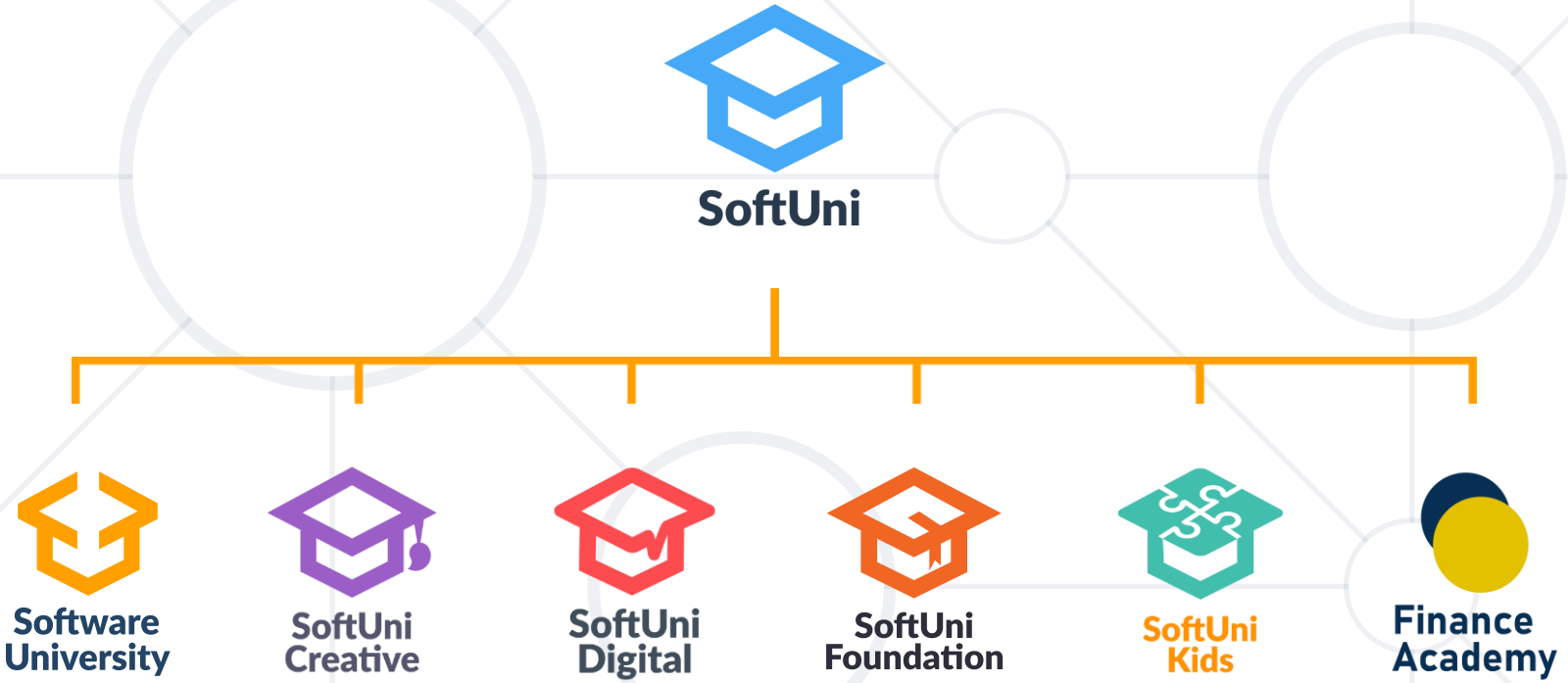


https://kubernetes.io/docs/setup/production-environment/tools/kubeadm/ha-topology/#external-etcd-topology

Practice

Live Exercise in Class (Lab)

Questions?



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