



Proxmox Virtual Environment

Fast Open Source Hypervisor

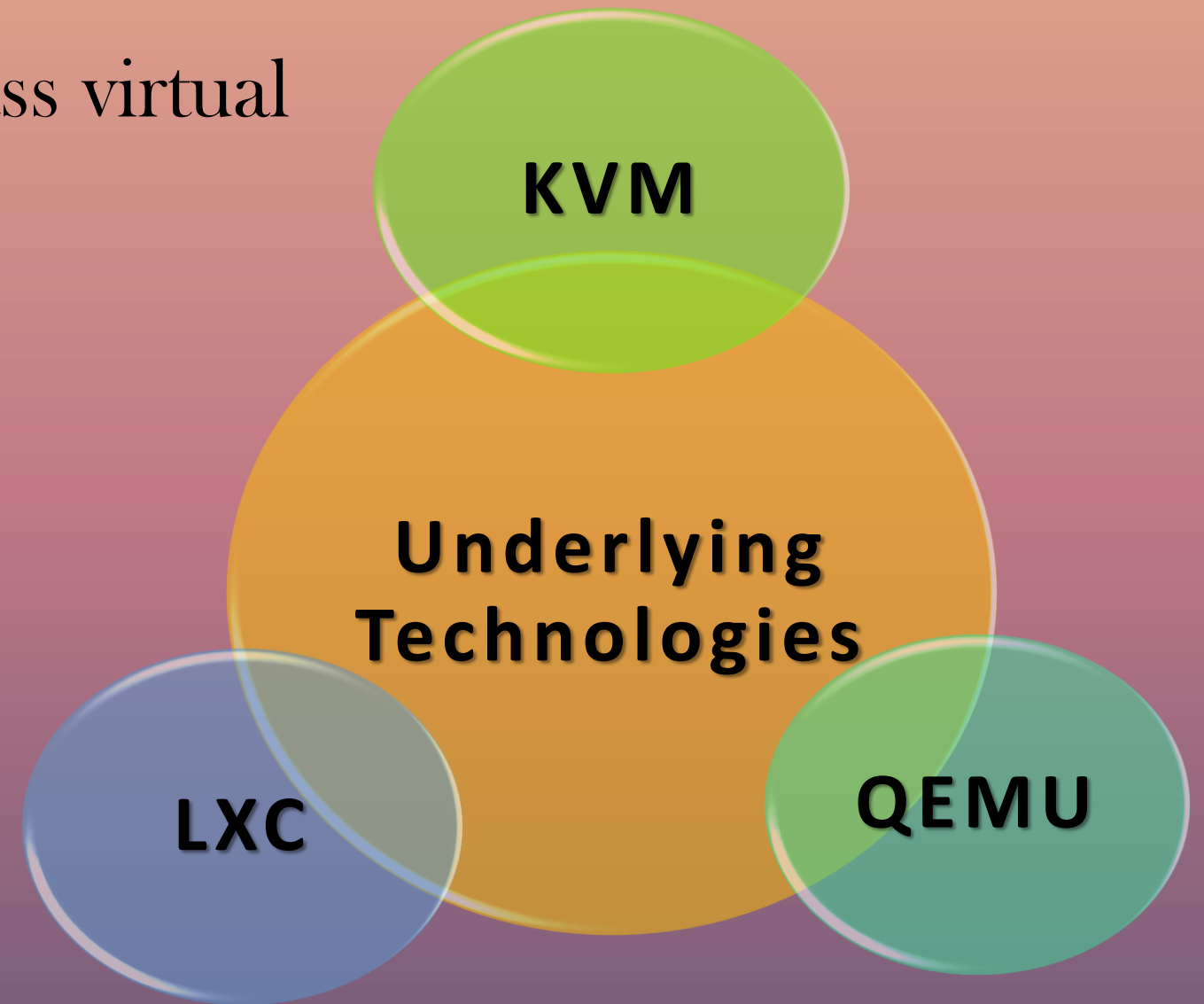
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Outlines

- ✓ *Overview of Proxmox VE*
- ✓ *Introduction on KVM and LXC*
- ✓ *Architecture & Features of Proxmox VE*
- ✓ *PVE Networking*
- ✓ *PVE Cluster*
- ✓ *Comparison of VMware ESXi and Proxmox VE*

Overview of Proxmox VE

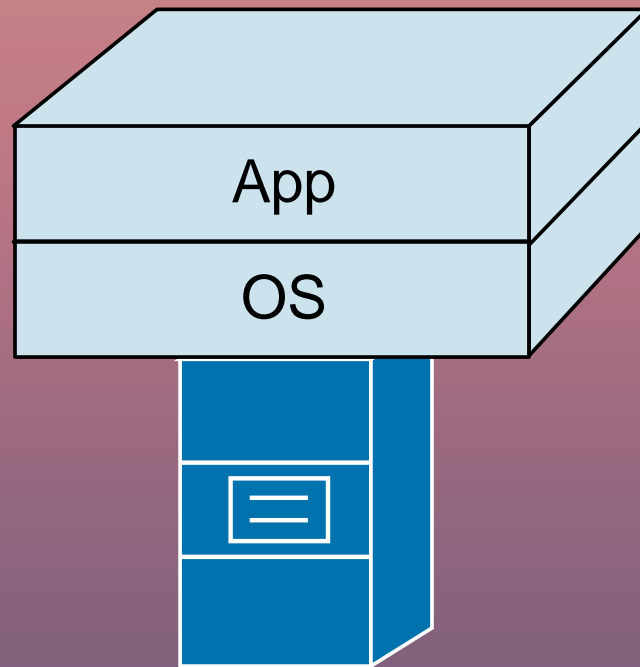
- ✓ Matured and well-supported enterprise-class virtual platform for servers
- ✓ Offers Virtualization and Containerization
- ✓ Open Source Code
- ✓ Debian based OS
- ✓ Type-2 Hypervisor



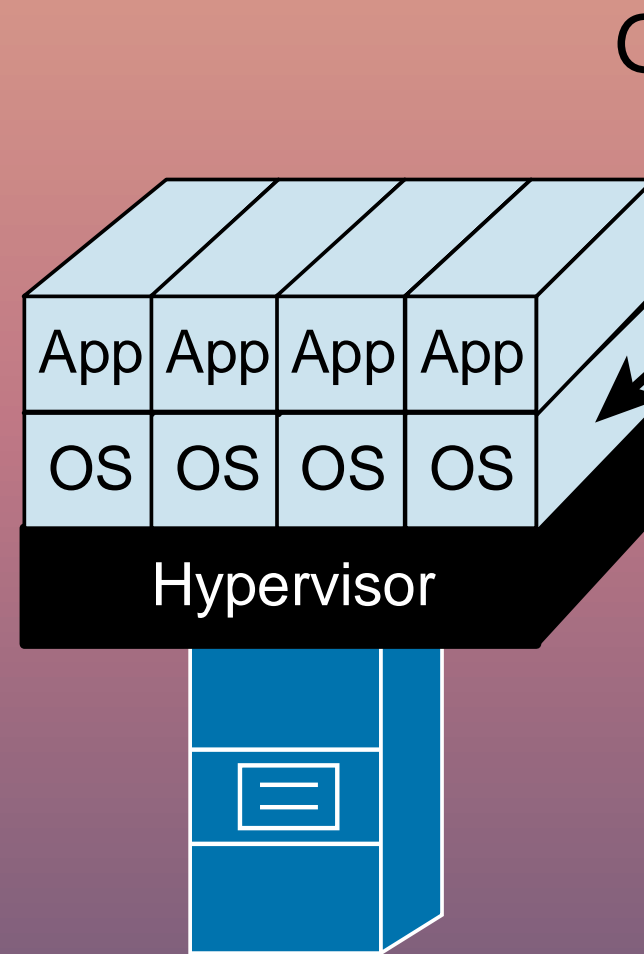
XPROX**MOX**

Server Virtualization Technology

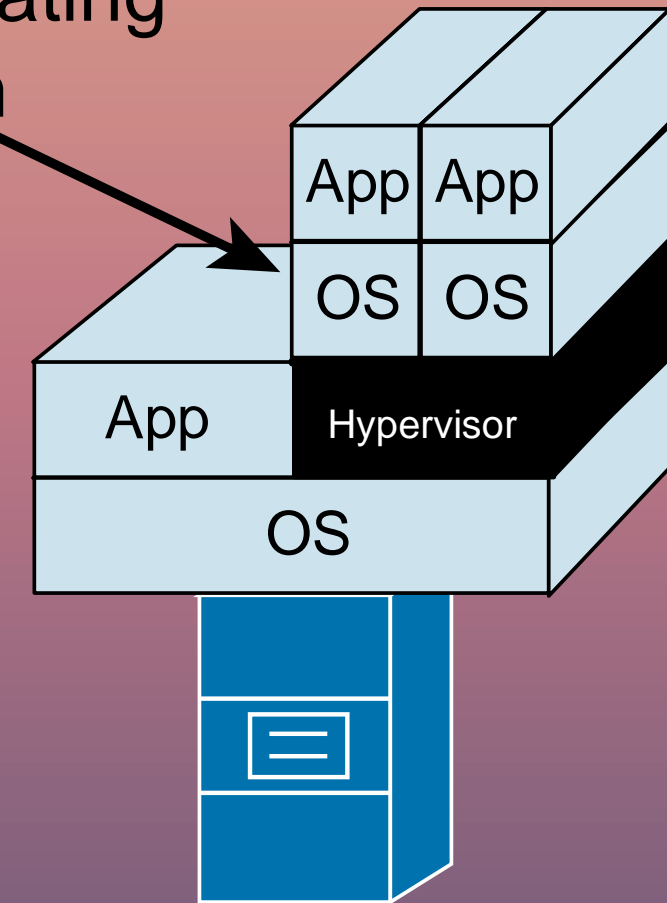
Physical Server



Type-1



Type-2



Introduction on KVM

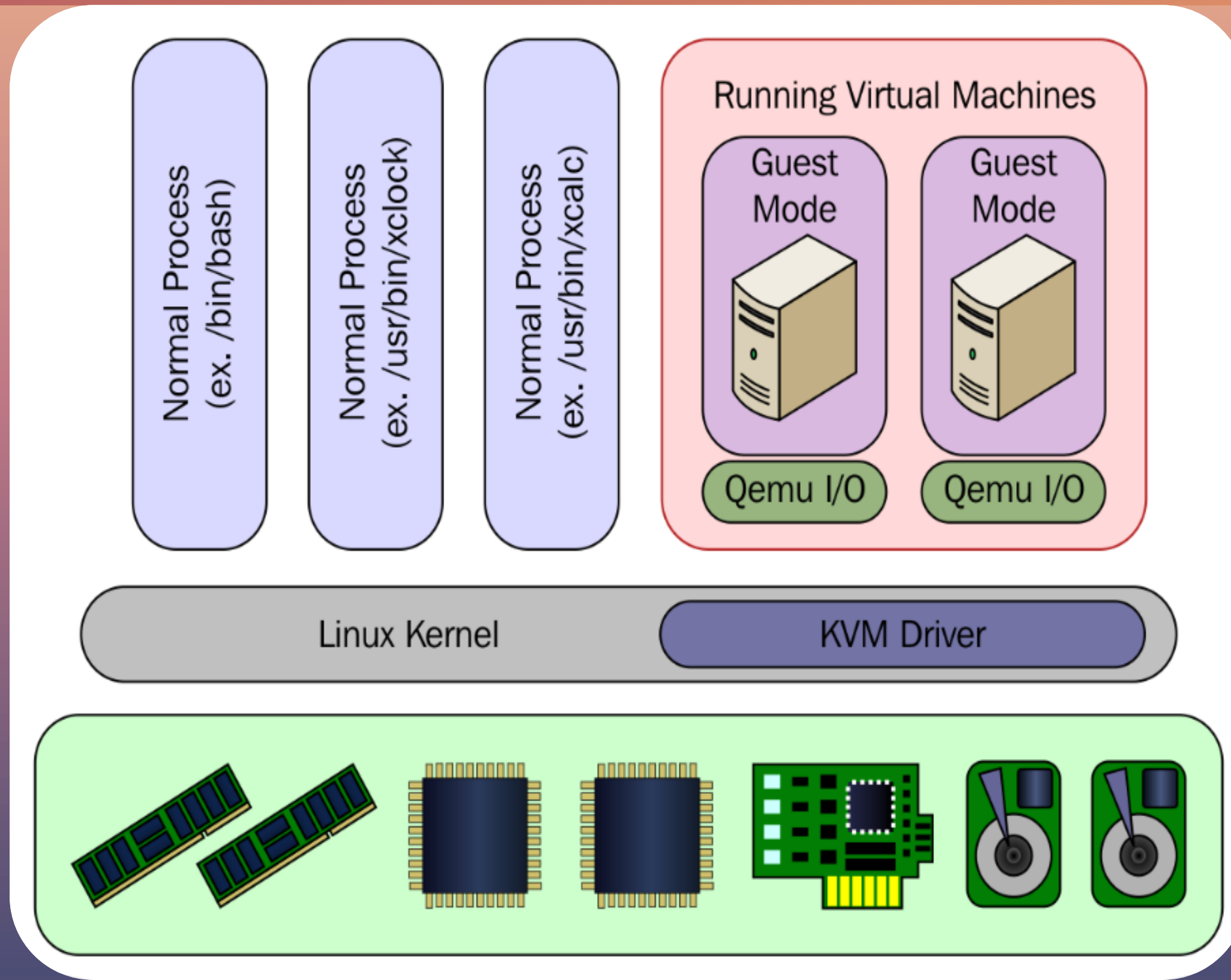
Kernel-based Virtual Machine

- ✓ Leading Virtualization Technology/Infrastructure or Module/Solution for Linux Kernel
- ✓ Works into Operating System (Linux Distros)
- ✓ Used with QEMU, called QEMU-KVM
- ✓ Allows the Kernel to function as a Hypervisor
- ✓ Open Source Technology
- ✓ Type-2 hypervisor



Architecture of KVM

Kernel-based Virtual Machine



Features and Use Case of KVM

Kernel-based Virtual Machine

FEATURES

- 1 Paravirtualization (VirtIO)
- 2 Hot Plug vCPU
- 3 Dynamic Memory Management
- 4 Live Migration

*Using KVM technology,
you can develop your
own Virtualization
Platform.*

Use Case

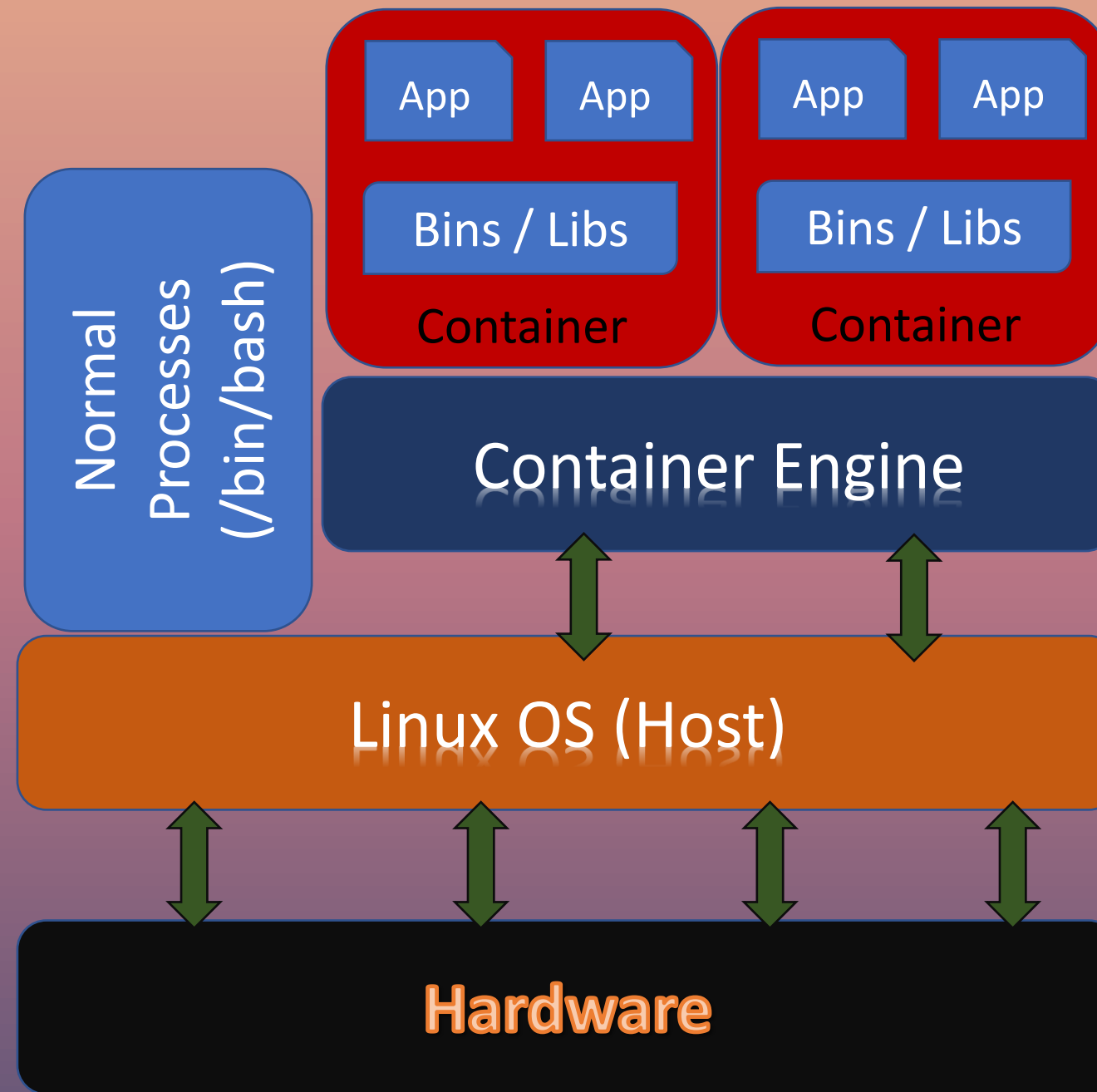
Introduction on LXC

Linux Container

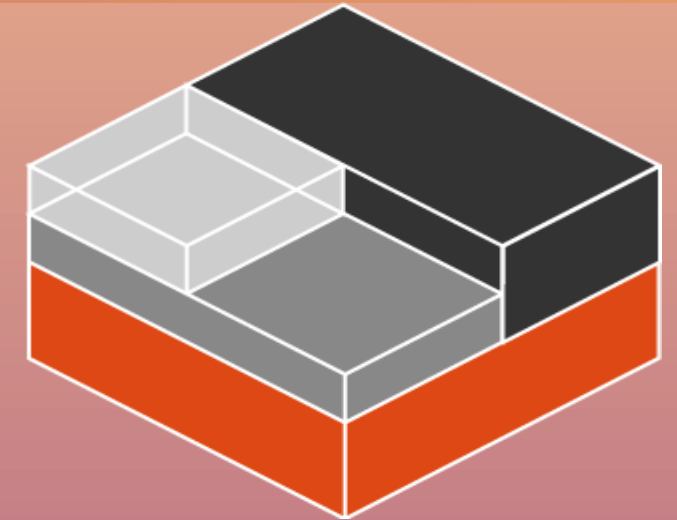
- ✓ Provides Operating System level virtualization
- ✓ Alternative to Hypervisors
- ✓ Running multiple, isolated Linux systems on a single Linux Control host
- ✓ Guests share the same kernel
- ✓ Guests perform like a standalone server
- ✓ Guests work as a Userspace interface
- ✓ No emulation, runs as process on the host
- ✓ Limited to Linux guests only



Architecture of LXC

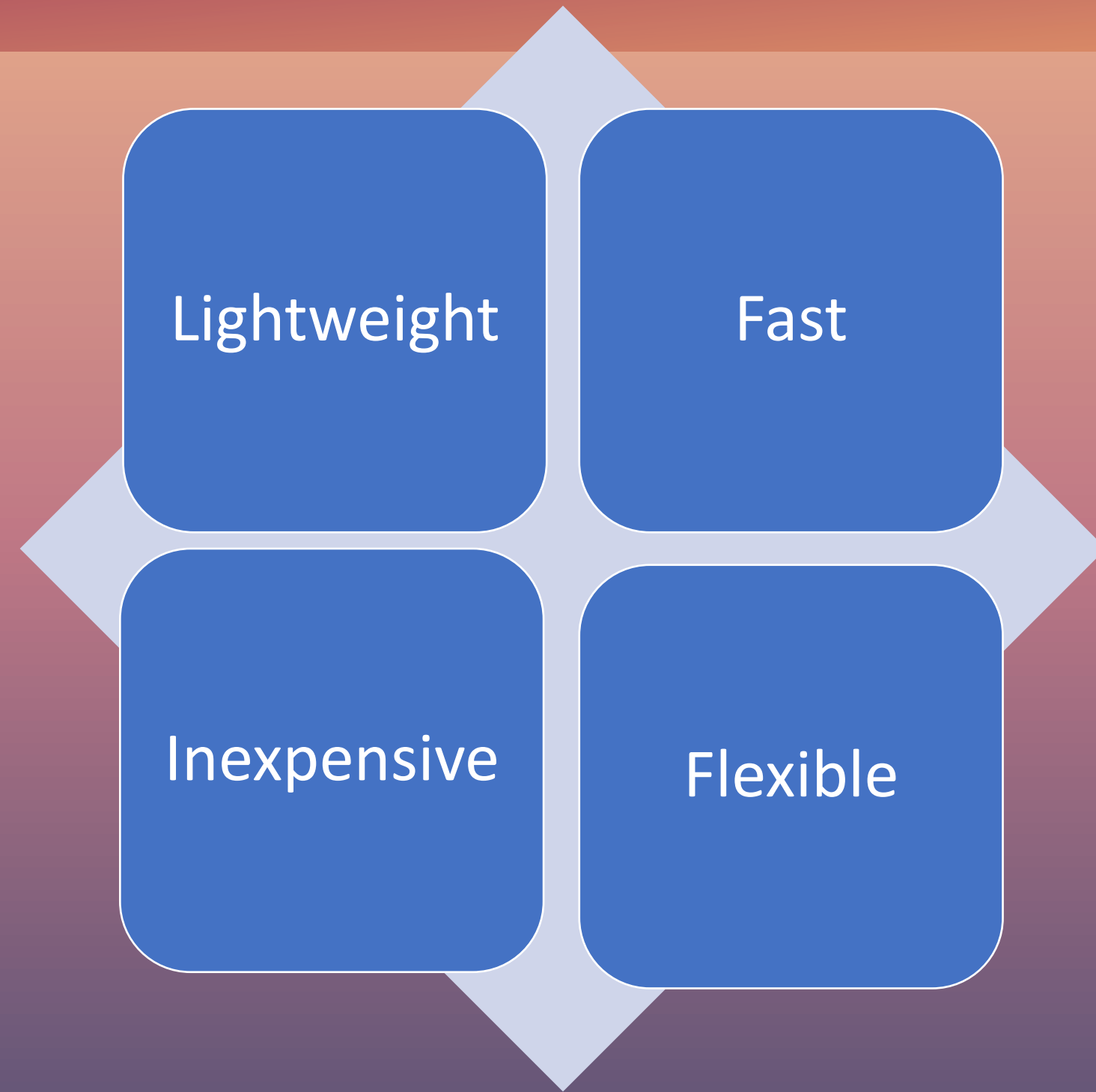


Linux Container



Why Linux Containers (LXC)

Linux Container



TTT Concept

Technology, Technique, Tool

TECHNOLOGY



KVM, LXC

TECHNIQUE

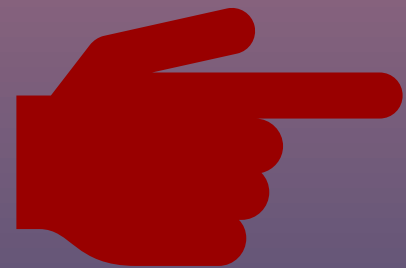


Virtualization
Containerization

TOOL



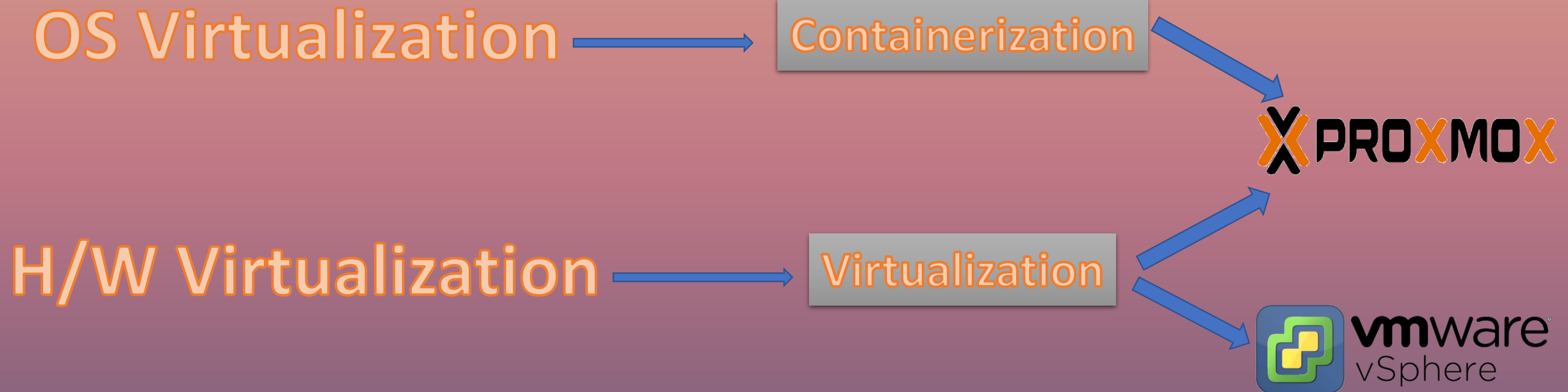
Proxmox VE



Proxmox internally uses KVM for full virtualization and LXC for containers.

Clarifying the Ambiguity

Virtualization, Containerization



XPROXMOX Stack

User Tools

qm

pct

pvesm

pvecm

pveum

pveceph

ha-manager

pve-firewall

Pveproxy pvedaemon pvestatd pve-ha-lrm pmxcfs

VM 101

App App

Guest OS

VM 100

App App

Guest OS

...

CT 200

App App

CT Distro

CT 201

App App

CT Distro

...

QEMU

KVM Module

Container Engine

Linux Kernel (Debian)

Normal
Processes
(/bin/bash)

Hypervisor types

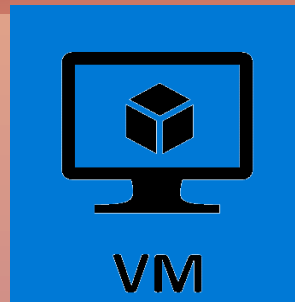
Linux Container



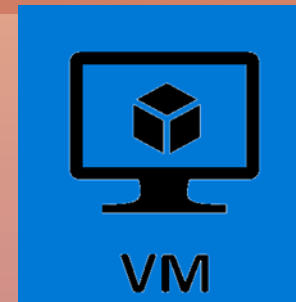
vCenter



vSphere Client



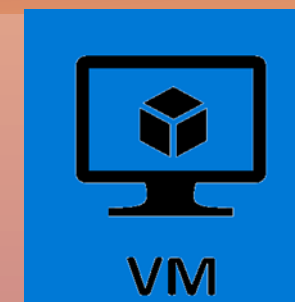
VM



VM

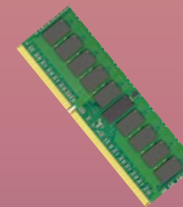


VM



VM

ESXI



Proxmox Management Interface

Web Client, CLI



Normal Processes
Ex.
/bin/bash



VM



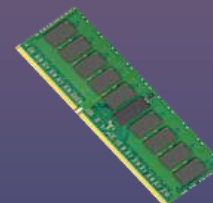
VM



KVM Driver

LXC Engine

Linux Kernel



XPROXMOX *VE Features*

FEATURES

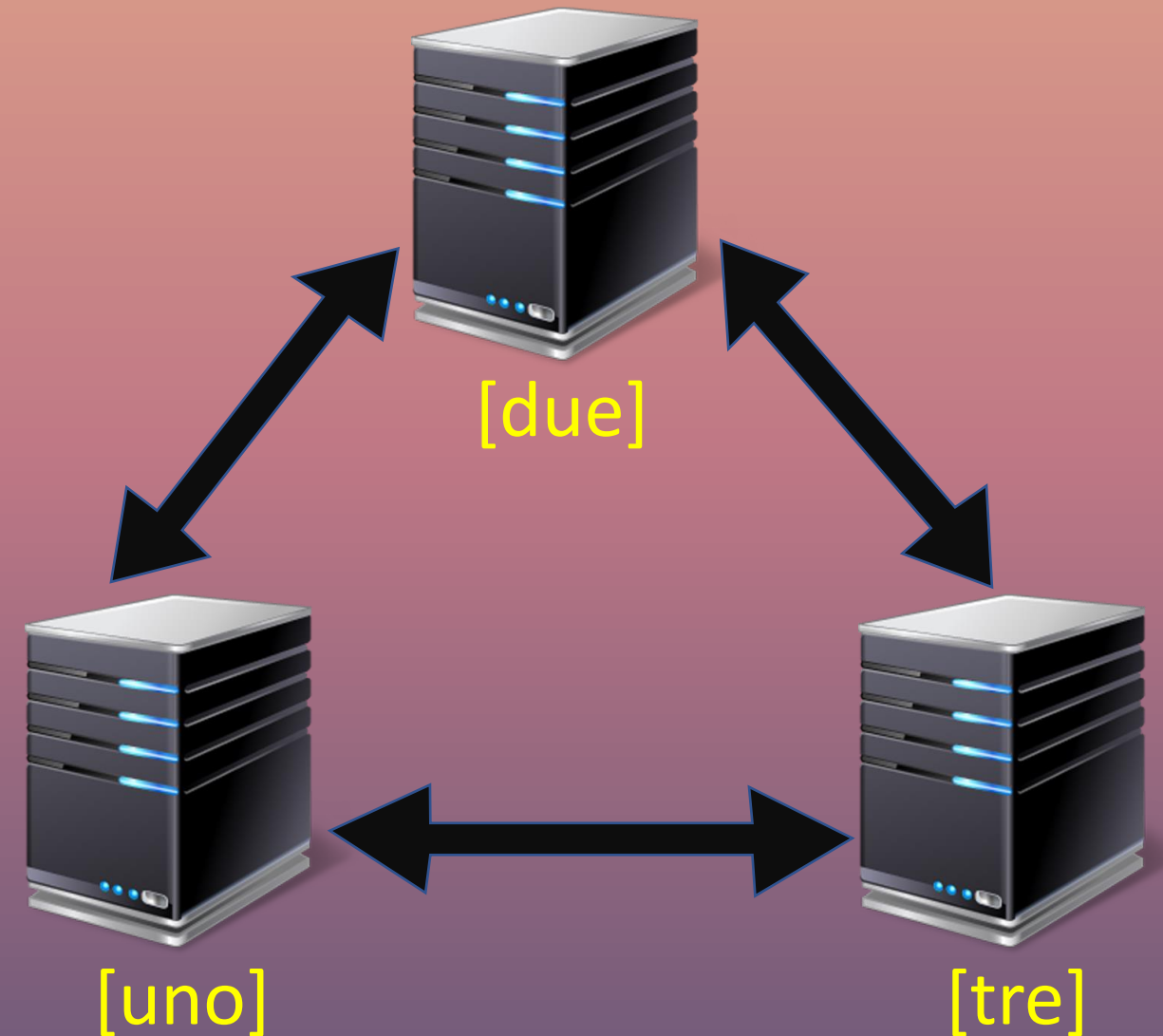
- 1 Well furnished Management tool
- 2 Full Virtualization and Containerization
- 3 High Availability
- 4 Live Migration
- 5 Clustering
- 6 Nested Virtual Environment



Proxmox VE Cluster

Clustering

- ✓ *Centralized, web based management*
- ✓ *Access the whole cluster on every node*
- ✓ *Unique multi-master design*
- ✓ *Easy migration of VM and CT between physical hosts*
- ✓ *Fast Deployment*
- ✓ *No single point of failure*



Networking with Proxmox VE

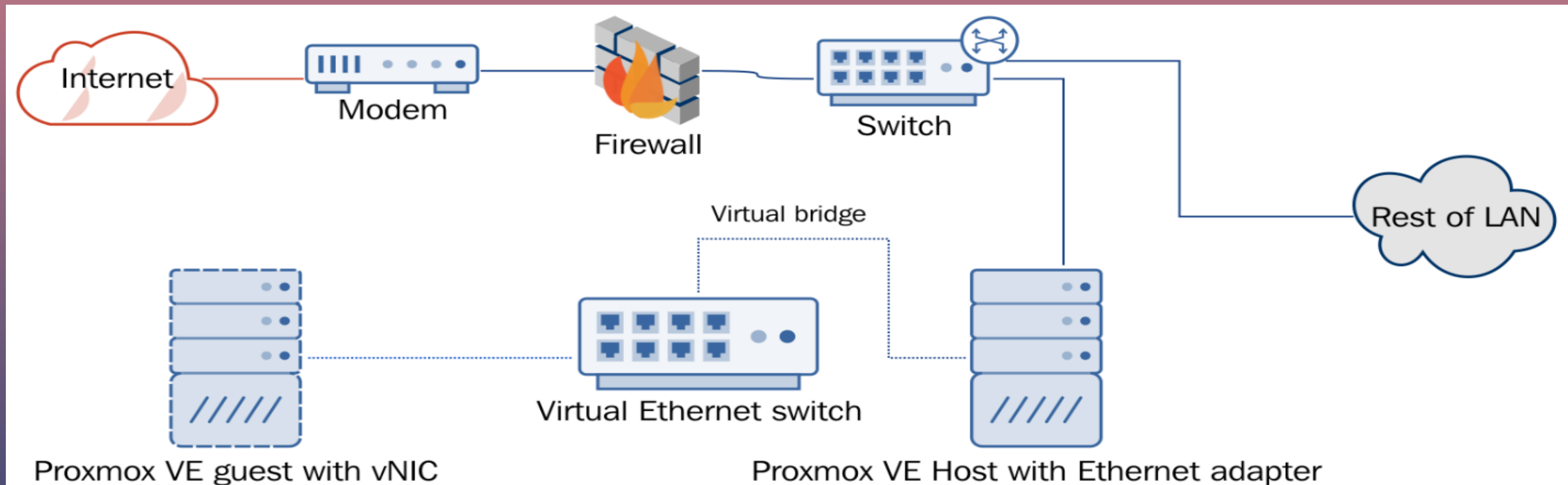
Network Models

- 1 Bridged
- 2 Masquerading with NAT
- 3 Routed configuration
- 4 VLAN support
- 5 NIC Bonding



Bridged Configuration

- ❑ This is the default network configuration for Proxmox VE virtual servers.
- ❑ All VM and CT can share the bridge, this is as if the network cables of all guest host were connected to the same switch.
- ❑ To connect guest hosts to the outside world, the bridge is connected to the physical network adapters for the host server to which are assigned the network configurations.
- ❑ VLAN tagging is also available.



Choosing a Network Configuration

PVE server in a private LAN, using an external gateway to reach the Internet

- **Bridged Model**

PVE server at hosting provider, with public IP ranges for guests

- **Bridged or Routed Model**

PVE server at hosting provider, with a single public IP address

- *Masquerading with NAT*

Comparison between VMware and proxmox

Features	Proxmox VE	VMware
Open Source	✓	✗
Integrated management Interface	Built-in Web management interface and shell-based CLI	Requires dedicated management server at additional cost
Supports Containers	✓	✗
Community Support	✓	✗
Host Isolation	Medium	Strong and Robust
Security	Less Secured	Highly Secured
Virtual Machine OS Support	Linux and Windows	Linux, Windows, and Unix
Live Migration	✓	✓
High Availability	✓	✓
Live VM Snapshots	✓	✓

THANK YOU
Any Questions ?



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