



Enterprise Virtualization using Proxmox

This 32 hours course features intensive hands-on training that focuses on installing, configuring, and managing Proxmox, which includes Proxmox Virtual Environment 7.2 and Proxmox Backup Server 2.3. This course prepares you to administer a full-fledge cloud infrastructure for an organization of any size. This course helps understand the mostly used technologies in software-defined data center.

Intended Audience

- System Administrators/ Engineers
- Network Engineer
- IT specialist
- Anyone who wants to deploy virtualization on Home-Lab

Prerequisites

This course has the following prerequisites:

- Basic Networking knowledge
- Familiar with Linux Operating systems

Course Delivery Options

- Live Online
- [Onsite](#)
- [On Demand](#)

Product Alignment

- Proxmox VE 7.2 or 7.3
- Proxmox Backup Server 2.3

Course Objectives

The training course consists of several modules and practical lab exercises, covering deployment, setup and configuration.

- Overview of Server Virtualization Technology
- Overview about Proxmox VE: concept, architecture, underlying technologies
- Single node setup
- Installation and software updates management
- Introduction to web-based management (GUI)
- Basics authentication and user management
- Network model
- Storage model - local and shared storage
- KVM: create and manage virtual machines-VM (Windows & Linux)
- LXC: create and manage containers-CT (Linux only)
- Local Backup – restore and scheduling any task
- Proxmox VE Firewall
- Proxmox VE Cluster: concept, architecture, features
- Hardware requirements for a cluster installation
- PVE Cluster: features / setup / configuration / management
- High Availability (HA) - Proxmox VE HA Manager and corosync
- Hyper-converged Infrastructure (HCI) with Ceph
- Software Defined Network
- Open-Source Enterprise Backup Solution using Proxmox Backup Server (PBS)
- Many exercises and hands-on troubleshooting throughout the training

Details Course Outlines

Module-01	Course Introduction <ul style="list-style-type: none"> • Introductions and course logistics • Course objectives
Module-02	Introduction to Virtualization Technologies <ul style="list-style-type: none"> • Virtualization Technologies & Architectural Overview • Hardware Core Components Overview • Hypervisor Overview • Explain Virtualization Types & Categories • What Virtualization Technologies Are Available ? • Important Virtualization Terminologies • Software-Define Data Center Overview
Module-03	Introduction of Containerization <ul style="list-style-type: none"> • What is LXC and LXD • Containerization Architecture and Overview • Why we use containers? • Containers vs Virtual Machines • LXC/LXD vs Docker
Module-04	Setup Proxmox Virtualization <ul style="list-style-type: none"> • Overview about Promox VE • Single node setup: concept, architecture, underlying technologies • Hardware requirements • Installation and Configuration of Proxmox VE • Software updates and NTP Configuration • Web-based management (GUI)
Module-05	Identity and Access Management (IAM) <ul style="list-style-type: none"> • Basics Authentication & Authorization • Securing The root Account • Permission Management & Privileges • Multi-Factor Authentication for Users • Groups and Roles

Module-06	Virtualization Networking Model <ul style="list-style-type: none"> • Proxmox Networking Basics and Network Diagram • IP Configuration & Management • VLAN Basics and Configuration • Bridge Configuration • Linux Bond Configuration
Module-07	Storage model - local and shared storage <ul style="list-style-type: none"> • Storage Concepts • Difference between Block, File & Object Storage. • Understand SAN storage including Fibre SAN, iSCSI SAN • Directory-based storage • Shared-LVM storage
Module-08	Virtual Machines and Containers <ul style="list-style-type: none"> • KVM: create and manage virtual machines (Windows & Linux) • LXC: create and manage containers (Linux only) • Manage VM/CT startup and shutdown behavior • Creating VM/Container Templates • Creating VM Clone • Modify and Manage Virtual Machines (Resource management)
Module-09	Proxmox VE Cluster setup: concepts / architecture / technology <ul style="list-style-type: none"> • Clustering Overview • Create Cluster • Join Cluster Nodes
Module-10	High Availability (HA) - The Proxmox VE HA Manager <ul style="list-style-type: none"> • High Availability (HA) Overview • Create HA Group • Resource Add, Restart & Relocate Configuration
Module-11	Hyper-converged Infrastructure (HCI) with Proxmox VE <ul style="list-style-type: none"> • Overview of Hyper Convergence • Benefits of HCI • Deploy Hyper-Converged Ceph Cluster • Ceph Installation & Configuration

Module-12	Testing <ul style="list-style-type: none"> • Live Migration • Auto-failover • High Availability (HA)
Module-13	Proxmox VE Firewall <ul style="list-style-type: none"> • Security enhancement concepts • IPtables/Firewall Overview • Generated IPtables Rules • Host-Specific Firewall Rules • VM Specific Firewall Rules • Security Group Implementation • Proxmox VE Hosts Security • Filter Remote IPs
Module-14	Software Defined Network <ul style="list-style-type: none"> • Basic Overview • Installation and Configuration • Different Zones and technologies • VNets setup • Controllers: EVPN and BGP • Integration of IPAMs and DNS plugins • Setup Example: VLAN, QinQ, VXLAN, EVPN • VXLAN IPSEC Encryption
Module-15	Data Protection: local Backup, Restore & Scheduling <ul style="list-style-type: none"> • Backup Procedure Overview • Backup Jobs & Retention Policy • VM Backup • VM Snapshot & VM Clone • VM Live Migration • VM Restore & Snapshot Revert

Module-16	Proxmox Backup Server (PBS): Open-Source Enterprise Backup Solution <ul style="list-style-type: none">• Overview and Features• Reasons for Data Backup?• Backup: Incremental & Deduplication• Installation and Configuration• Integration with Proxmox VE• Backup Job creation and management• Restoration
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