

Proxmox VE – Installation and Management of Virtual Infrastructure

Course code: PVCS

Proxmox VE is a robust open-source server virtualization platform that combines KVM (Kernel-based Virtual Machine) for full virtualization and LXC containers in a single, powerful solution. It enables centralized management of virtual machines, containers, storage, and networking through a unified web-based interface, scaling from a single server to highly available clusters. Thanks to its open-source nature and free licensing model, Proxmox VE is a popular alternative to commercial solutions such as VMware.

Who is the course for

- System administrators and IT professionals managing virtualized environments
- Server administrators planning to migrate from VMware to an open-source solution
- IT specialists focused on virtualization and infrastructure management
- Technical professionals responsible for the design, deployment, and management of virtual servers and containers

What we teach you

The course will guide you step by step from the initial installation and configuration of Proxmox VE to advanced features such as clustering, high availability, and VMware migration. Upon completion, you will be able to efficiently manage a virtualized infrastructure, optimize server performance, and automate maintenance using the Proxmox VE platform, including the management of networking, storage, backup, and security.

- Understand the fundamental principles of virtualization with KVM and LXC
- Install and configure Proxmox VE in both single-node and clustered environments
- Efficiently manage virtual machines and containers
- Perform data backup, recovery, and replication
- Migrate virtual servers from VMware to Proxmox VE

Required skills

- Advanced knowledge of Linux system administration
- Basic understanding of TCP/IP networking
- Prior experience with virtualization on another platform (such as VMware, Hyper-V, or KVM) is an advantage, but not required

Course outline

1. Introduction to Proxmox VE and Virtualization Technologies

- Introduction to virtualization, KVM, and LXC technologies
- Overview of Proxmox VE features and use cases

2. Proxmox VE Architecture

- Core components and their roles
- How Proxmox VE works behind the scenes

3. Installing Proxmox VE

- Hardware, networking, and storage requirements
- Single-node installation (Lab)
- Initial Proxmox VE configuration after installation
- Updates and repository management

4. Working with the Proxmox VE Interface

- Web interface (Web GUI) and command-line interface (CLI)
- Basic configuration using the GUI and CLI (Lab)
- User management, roles, and authentication

5. Networking Configuration

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- Networking models in Proxmox VE (bridged, NAT, VLAN)
- Creating and configuring virtual switches
- Network security and isolation

6. Virtual Machines and Containers

- Differences between KVM (full virtualization) and LXC (containers)
- Creating and configuring KVM virtual machines
- Working with LXC containers: creation, management, and optimization
- Performance and security comparison

7. Storage and Backup

- Supported storage backends (Local, ZFS, Ceph, NFS, iSCSI)
- Configuring local and remote storage
- Automated virtual machine backup and recovery
- Snapshots and data replication

8. Security and Firewall

- Configuring the integrated Proxmox VE firewall
- Securing access and isolating virtual environments

9. High Availability and Clustering

- Creating a multi-node cluster
- Configuring high availability (HA) and failover
- Cluster monitoring and maintenance

10. VMware Migration

- Preparing VMware hosts for migration
- Importing virtual machines
- Online vs. offline migration
- Post-migration performance optimization

11. Best Practices and Advanced Topics

- Optimizing the performance of virtual machines and containers
- Cluster management and monitoring
- Discussion of real-world scenarios and case studies