Proxmox Virtual Environment

OVERVIEW

Proxmox Virtual Environment is a complete, open-source solution for enterprise virtualization, that integrates the KVM hypervisor and Linux containers (LXC), software-defined storage and networking functionality, on a single platform. From the central user interface, you can manage VMs and containers, storage resources, network configuration, and high availability for clusters. The interface also provides access to multiple out-of-the-box tools for tasks such as backup/restore, live-migration, storage replication, and firewall configuration.

Proxmox VE is designed to scale to cluster-level and enables you to virtualize even the most demanding of Linux and Windows application workloads. By combining two virtualization technologies on a single platform, Proxmox VE provides maximum flexibility to your data center. It includes strong high-availability (HA) support and—thanks to the unique multi-master design—you don’t need any additional management server, thus saving resources and allowing HA without a single point of failure (SPOF).

ENTERPRISE-READY

Enterprises use the powerful Proxmox VE platform to easily install, manage, and monitor their hyper-converged (HCI) data centers. Multiple authentication sources, combined with role-based user and permission management enable flexible control of HA clusters. The REST API enables easy integration of third-party management tools, such as custom hosting environments.

The future-proof and open-source development model of Proxmox VE guarantees full access to the product's source code as well as maximum flexibility and security.
KEY FEATURES

INDUSTRY-LEADING ENTERPRISE VIRTUALIZATION
- Linux and Windows servers, 32- and 64-bit operating systems.
- Support for the latest Intel and AMD server chip sets – for great VM performance.
- Near bare-metal performance for real-world enterprise workloads.
- Management layer containing all the capabilities to manage and monitor an open-source, software-defined data center.

OPEN-SOURCE SOFTWARE
- Published under the free and open-source GNU Affero General Public License, version 3 (AGPL,v3: http://www.gnu.org/licenses/agpl-3.0.html).
- Designed for community cooperation.
- Public code repository (Git).
- Bug tracker for issue tracking.
- Community support forum.
- Documentation, wiki, video tutorials, HOW-TOs, ...

ENTERPRISE SUPPORT AGREEMENT
- Subscriptions to ensure business continuity.
- Exclusive access to the stable Enterprise Repository.
- Updates and version upgrades via GUI.
- Professional support from the Proxmox developers.

HIGHLY AVAILABLE (HA) CLUSTER
- No single point of failure (no SPOF).
- Multi-master cluster.
- Manage the HA settings for KVM and LXC via GUI.
- pmxcfs—unique Proxmox VE Cluster File System: database-driven file system for storing configuration files, replicated in real-time across all nodes using Corosync.
- Based on proven Linux HA technologies, providing stable and reliable HA service.
- Resource agents for KVM and containers (LXC).
- Watchdog-based fencing.

FENCING
- The Proxmox VE HA Manager uses self fencing, provided by hardware watchdog or kernel softdog timers.
- No simultaneous data access or corruption.
- Works „out-of-the-box“.
- Includes Proxmox VE HA Simulator for testing.

COMMAND LINE (CLI)
- Manage all components of your virtual environment.
- CLI with intelligent tab completion.
- Full UNIX man page documentation.

WEB-BASED MANAGEMENT INTERFACE
- Integrated - no need to install a separate management tool or any additional management node.
- Fast and easy creation of VMs and containers.
- Seamless integration and easy management of an entire cluster.
- Fast, search-driven interface, able to handle thousands of VMs.
- Based on the Ext JS JavaScript framework.
- Secure HTML5 console, supporting SSL.
- Let’s Encrypt TLS certificates via the DNS-based challenge mechanism (or http).
- Subscription management via GUI.
- Simple management of APT repositories via GUI.
- Integrated documentation.
- Available in multiple languages.

ANDROID APP
- Connect to Proxmox VE instances.
- Manage clusters, nodes, VMs, and containers.
- Access SPICE and HTML5 consoles.
- Based on the Flutter framework.

LIVE/ONLINE MIGRATION
- Move QEMU virtual machines from one physical host to another with zero downtime.
KEY FEATURES

FLEXIBLE STORAGE OPTIONS
- Local storage such as ZFS (encryption possible), Btrfs, LVM, and LVMthin.
- Shared storage such as CIFS, iSCSI or NFS.
- Distributed storage such as Ceph RBD and CephFS.
- Encryption support for Ceph OSD and ZFS.
- Unlimited number of storage definitions (cluster-wide).

REST API
- Easy integration for third-party management tools.
- REST API (JSON as primary data format).
- Easy and human readable data format (native web browser format).
- Full support for API tokens
- Automatic parameter verification (verification of return values).
- Automatic generation of API documentation.
- Easy means of creating command line tools (use the same API).
- Resource Oriented Architecture (ROA).
- Declarative API definition using JSON Schema.

STORAGE REPLICAION STACK (ZFS)
- Built-in, open-source storage replication framework.
- Redundancy for guests using local storage.
- Data availability without using shared storage.
- Asynchronous replication.
- Minimize data loss in the case of a failure.
- Improve reliability, fault-tolerance, and accessibility of your data.
- Enables fast, live migration.
- Flexible scheduling options with ‘pvescheduler’.

SOFTWARE-DEFINED STORAGE (SDS) WITH CEPH
- Integrated Ceph, a distributed object store and file system.
- Management via GUI or CLI.
- Run Ceph RBD and CephFS directly on the Proxmox VE cluster nodes.
- Easy-to-use installation wizard.
- Proxmox delivers its own Ceph packages.
- Ceph support is included in the support agreement.
- Configure external Ceph clusters via the API.

VIRTUALIZED NETWORKING
- Flexible network configuration options.
- Each host with up to 4094 bridges.
- Simple TCP/IP configuration.
- IPv4 and IPv6 support.
- Support for Linux bridges and VLANs.
- Integrates Open vSwitch.

BACKUP AND RESTORE
- Full backups of VMs and containers.
- Live snapshot backups.
- Define flexible backup job schedules with ‘pvescheduler’.
- Configure multiple backup storages.
- GUI and CLI integration.
- Backup and restore via GUI.
- Set up backup retention policies via GUI.
- Run scheduled backup jobs manually in the GUI.
- Monitor backup jobs via the GUI’s “Tasks” tab.

INTEGRATION OF PROXMOX BACKUP SERVER
- Full support for the open-source, enterprise backup solution from Proxmox.
- Incremental, fully deduplicated backups of VMs, containers, and physical hosts.
- QEMU dirty-bitmaps for VM backup.
- Strong encryption on the client-side, with easy encryption key management.
- Single-file and directory restore.
- With live-restore, guests start as soon as the restore does.

TWO-FACTOR AUTHENTICATION
- Providing high security.
- Support for multiple 2nd factors for a single account.
- Ability to use a hardware token (Webauthn, TOTP, Yubikey-OTP).
- Generate single-use recovery code.
KEY FEATURES

MULTIPLE AUTHENTICATION SOURCES
- Proxmox VE supports multiple authentication sources.
- Linux PAM standard authentication (e.g., 'root' and other local users).
- Built-in Proxmox VE authentication server.
- Microsoft Active Directory (MS ADS).
- LDAP
- Single Sign-On (SSO) with OpenID Connect

ROLE-BASED ADMINISTRATION
- User and permission management for all objects (VMs, storage systems, nodes, etc.)
- Proxmox VE comes with a number of predefined roles (groups of privileges) which cover common use cases. The contained privileges can be seen in the GUI.
- Permissions to control access to objects (access control lists). Each permission specifies a subject (user or group) and a role (set of privileges) on a specific path.

VM TEMPLATES AND CLONES
- Deploying VMs from templates is blazing fast, very convenient, and if you use linked clones, highly storage efficient.
- Linked and full clones.

PROXMOX VE FIREWALL
- Supporting IPv4 and IPv6.
- Linux-based netfilter technology. Stateful firewall provides high bandwidth.
- Distributed: main configuration in Proxmox VE cluster file system, with iptable rules stored in nodes.
- Cluster-wide settings.
- 3 levels of configuration (data center, host, VM/CT).
- Support for 'raw' tables; enable SYN flood attack protection.
LEARN MORE
Wiki: https://pve.proxmox.com
Community Forums: https://forum.proxmox.com
Bugtracker: https://bugzilla.proxmox.com
Code repository: https://git.proxmox.com

HOW TO BUY
Visit the Proxmox Online Shop to purchase a subscription: https://shop.proxmox.com
Find an authorized reseller in your area: https://www.proxmox.com/partners

SALES INQUIRIES
office@proxmox.com

HELP AND SUPPORT
Proxmox Customer Portal: https://my.proxmox.com
Support Forum: https://forum.proxmox.com

TRAINING PROXMOX VE
Learn Proxmox VE easily – Visit a training: https://www.proxmox.com/training

ABOUT PROXMOX
Proxmox Server Solutions GmbH is a software provider, dedicated to develop powerful and efficient open-source server solutions. The privately held company is based in Vienna (Europe).

Proxmox Server Solutions GmbH
Bräuhausgasse 37
1050 Vienna
Austria

office@proxmox.com
https://www.proxmox.com

© 2022 Proxmox Server Solutions GmbH. All Rights Reserved.
Proxmox and the Proxmox logo are either registered trademarks or trademarks of Proxmox Server Solutions GmbH in the EU, the U.S., and other countries. All other marks mentioned herein belong to their respective owners.