

# Proxmox – a VMware alternative (?)

April 2024, Thilo Lauer

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# Agenda

- ▶ Proxmox

# Agenda, V1.1

- ▶ State of affairs with VMware
- ▶ New solution: Proxmox
  - ▷ Features
  - ▷ Comparison with ESXi
  - ▷ Licensing, Support
  - ▷ First experiences with VMS on Proxmox

In 2023 Broadcom took over VMware

- "Changes" in licensing
- Portfolio reduction
- Contracts with VMware partners cancelled



...which has lead to customers re-evaluating their virtualization environment

One possible alternative might be Proxmox. Let's have a closer look...



# Who is Proxmox?

- Proxmox Server Solutions GmbH located in Vienna, Austria ([www.proxmox.com](http://www.proxmox.com))
- “software provider dedicated to developing powerful and efficient open-source server solutions”
- Privately held
- Staged Support & Training offered

# What is Proxmox?

- “Proxmox Virtual Environment” (Proxmox VE, PVE)
- Based on a modified Debian Linux kernel
- Uses QEMU/kvm as virtualization engine
- Released under GNU AGPLv3 license
- Management via Web-based GUI, CLI or REST API

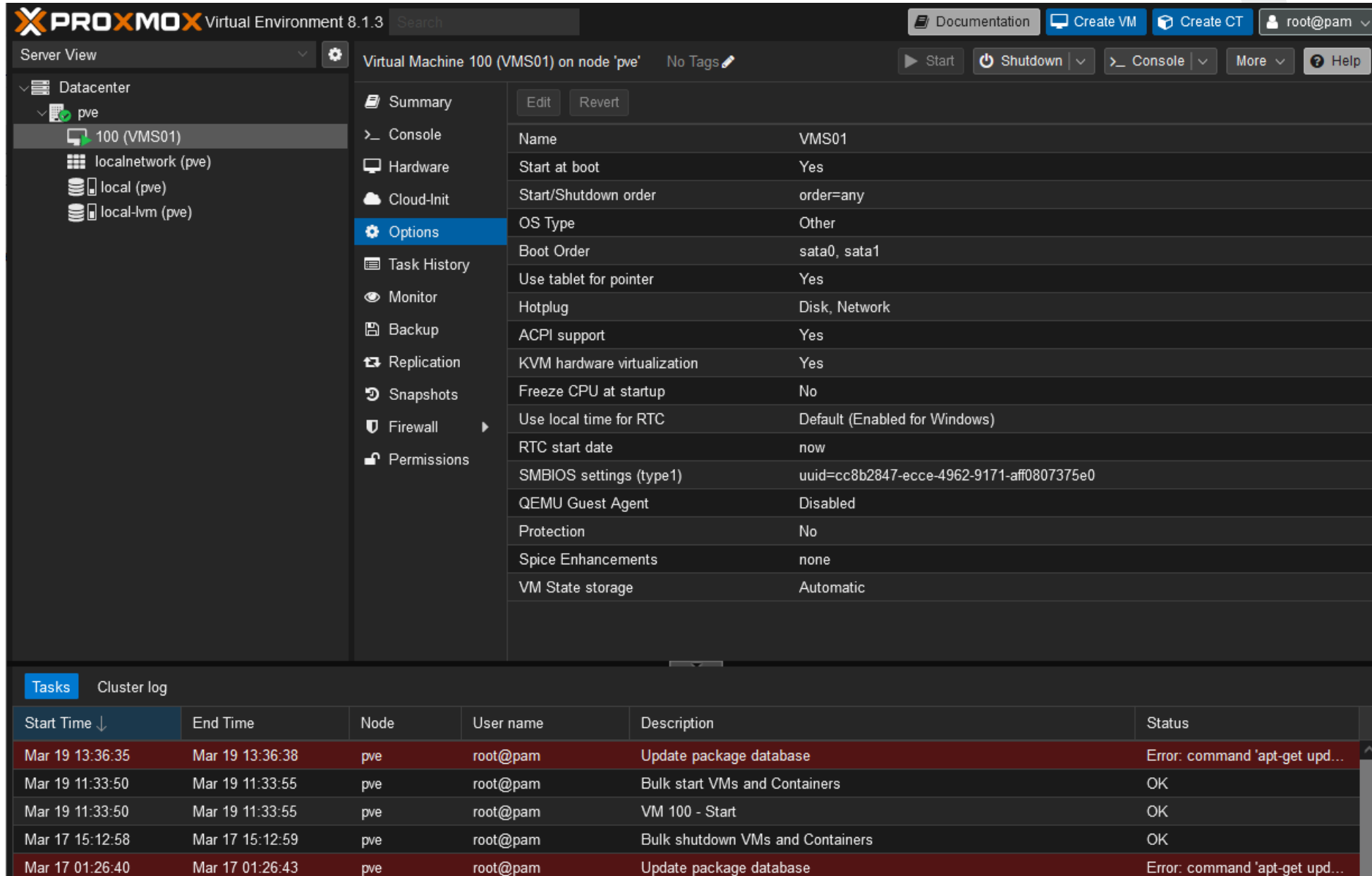
# How does Proxmox look like?

The screenshot displays the Proxmox Virtual Environment 8.1.3 web interface. The top navigation bar includes the Proxmox logo, version number, a search bar, and links for Documentation, Create VM, Create CT, and the user profile (root@pam). The left sidebar shows the 'Server View' and a tree structure under 'Datacenter' containing 'pve' and its sub-items: '100 (VMS01)', 'localnetwork (pve)', 'local (pve)', and 'local-lvm (pve)'. The main content area is titled 'Datacenter' and features a sidebar menu with options like Search, Summary, Notes, Cluster, Ceph, Options (selected), Storage, Backup, Replication, Permissions, Users, API Tokens, Two Factor, Groups, Pools, and Roles. The 'Options' page shows a list of settings such as Keyboard Layout, HTTP proxy, Console Viewer, Email from address, MAC address prefix, Migration Settings, HA Settings, Cluster Resource Scheduling, U2F Settings, WebAuthn Settings, Bandwidth Limits, Maximal Workers/bulk-action, Next Free VMID Range, Tag Style Override, User Tag Access, and Registered Tags. At the bottom, the 'Tasks' tab is active, displaying a table of recent tasks.

Start Time ↓	End Time	Node	User name	Description	Status
Mar 19 13:36:35	Mar 19 13:36:38	pve	root@pam	Update package database	Error: command 'apt-get upd...
Mar 19 11:33:50	Mar 19 11:33:55	pve	root@pam	Bulk start VMs and Containers	OK
Mar 19 11:33:50	Mar 19 11:33:55	pve	root@pam	VM 100 - Start	OK
Mar 17 15:12:58	Mar 17 15:12:59	pve	root@pam	Bulk shutdown VMs and Containers	OK
Mar 17 01:26:40	Mar 17 01:26:43	pve	root@pam	Update package database	Error: command 'apt-get upd...



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**Virtual Machines**

Running	1
Stopped	1

**LXC Container**

Running	0
Stopped	0

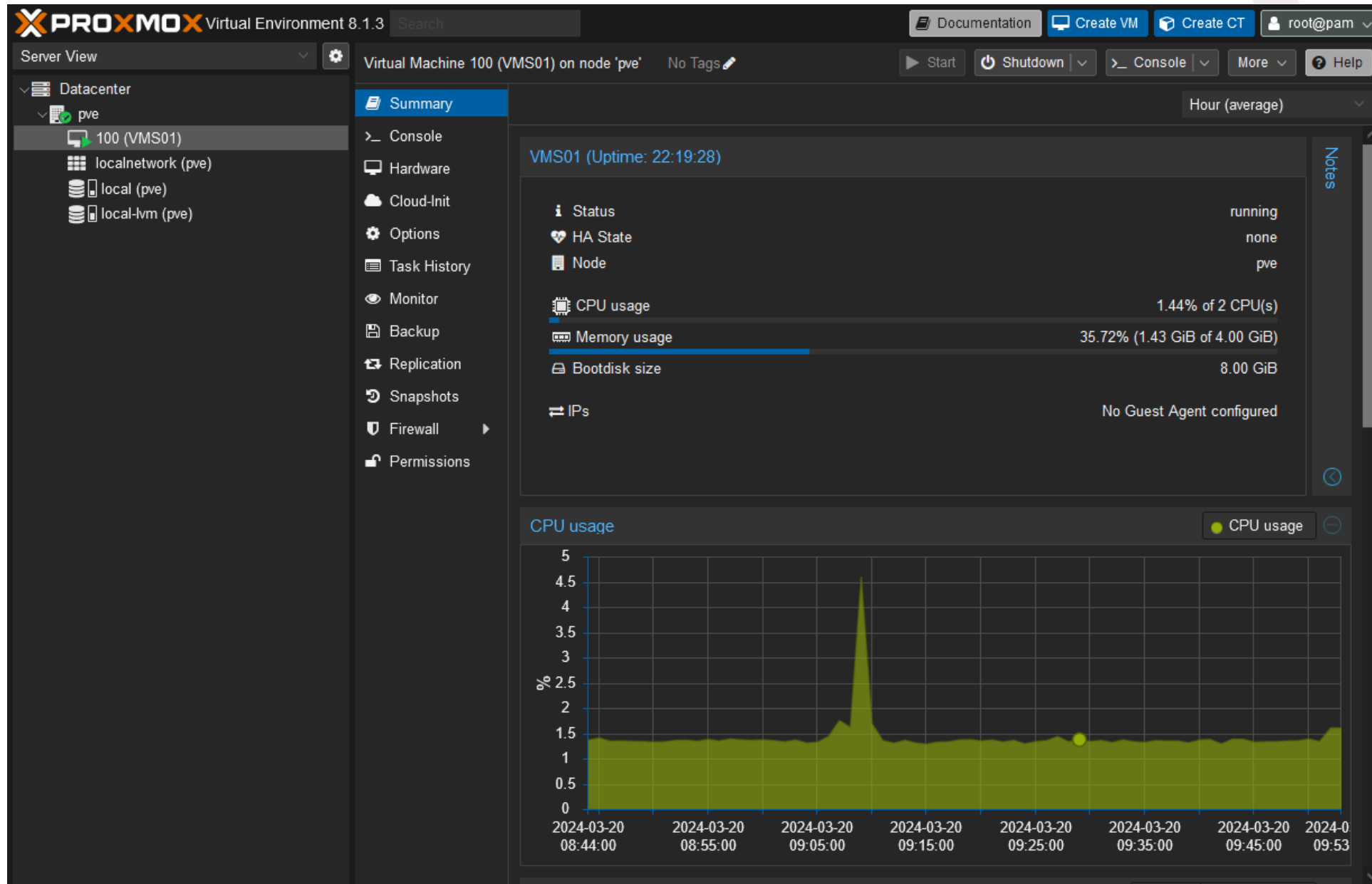
**Resources**

- CPU:** 1% of 4 CPU(s)
- Memory:** 37% (2.88 GiB of 7.71 GiB)
- Storage:** 41% (11.22 GiB of 27.30 GiB)

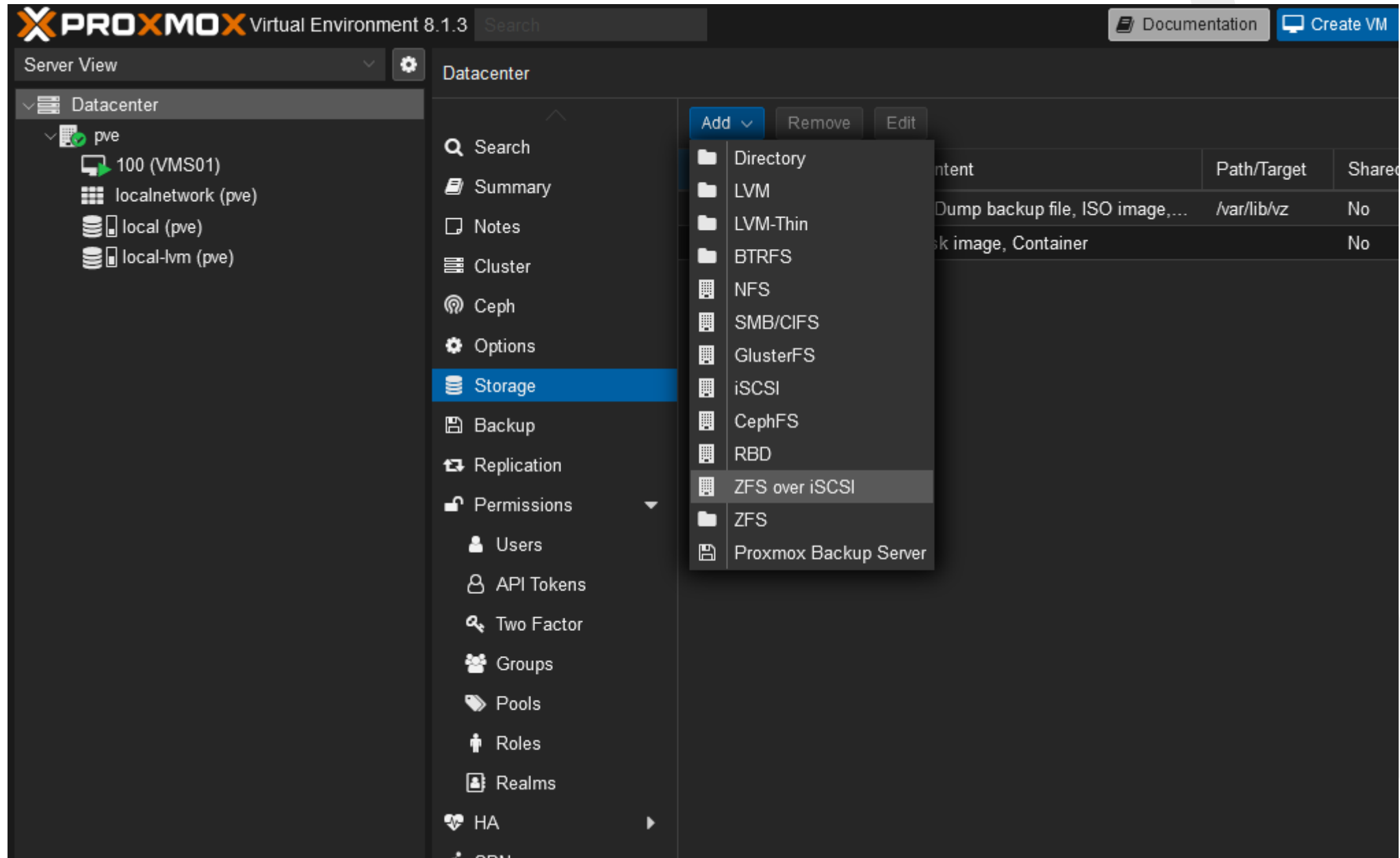
**Nodes**

Name	ID	Online	Support	Server Address	CPU usage	Memory usage	Uptime
pve	0	✓	-	192.168.146.129	1%	37%	22:47:18

# How does Proxmox look like?



# Configuring the host – create storage space



The screenshot displays the Proxmox VE 8.1.3 web interface. The top navigation bar includes the Proxmox logo, the version number, a search bar, and links for 'Documentation' and 'Create VM'. The left sidebar shows the 'Server View' and a tree structure under 'Datacenter' containing 'pve' and its sub-items: '100 (VMS01)', 'localnetwork (pve)', 'local (pve)', and 'local-lvm (pve)'. The main panel is titled 'Datacenter' and features a central menu with options like 'Search', 'Summary', 'Notes', 'Cluster', 'Ceph', 'Options', 'Storage' (highlighted), 'Backup', 'Replication', 'Permissions', 'Users', 'API Tokens', 'Two Factor', 'Groups', 'Pools', 'Roles', 'Realms', 'HA', and 'CDN'. An 'Add' dropdown menu is open, listing storage types: 'Directory', 'LVM', 'LVM-Thin', 'BTRFS', 'NFS', 'SMB/CIFS', 'GlusterFS', 'iSCSI', 'CephFS', 'RBD', 'ZFS over iSCSI' (highlighted), 'ZFS', and 'Proxmox Backup Server'. The background shows a table with columns for 'Content', 'Path/Target', and 'Shared'.

Content	Path/Target	Shared
Dump backup file, ISO image,...	/var/lib/vz	No
disk image, Container		No

# Creating a new (VMS) VM

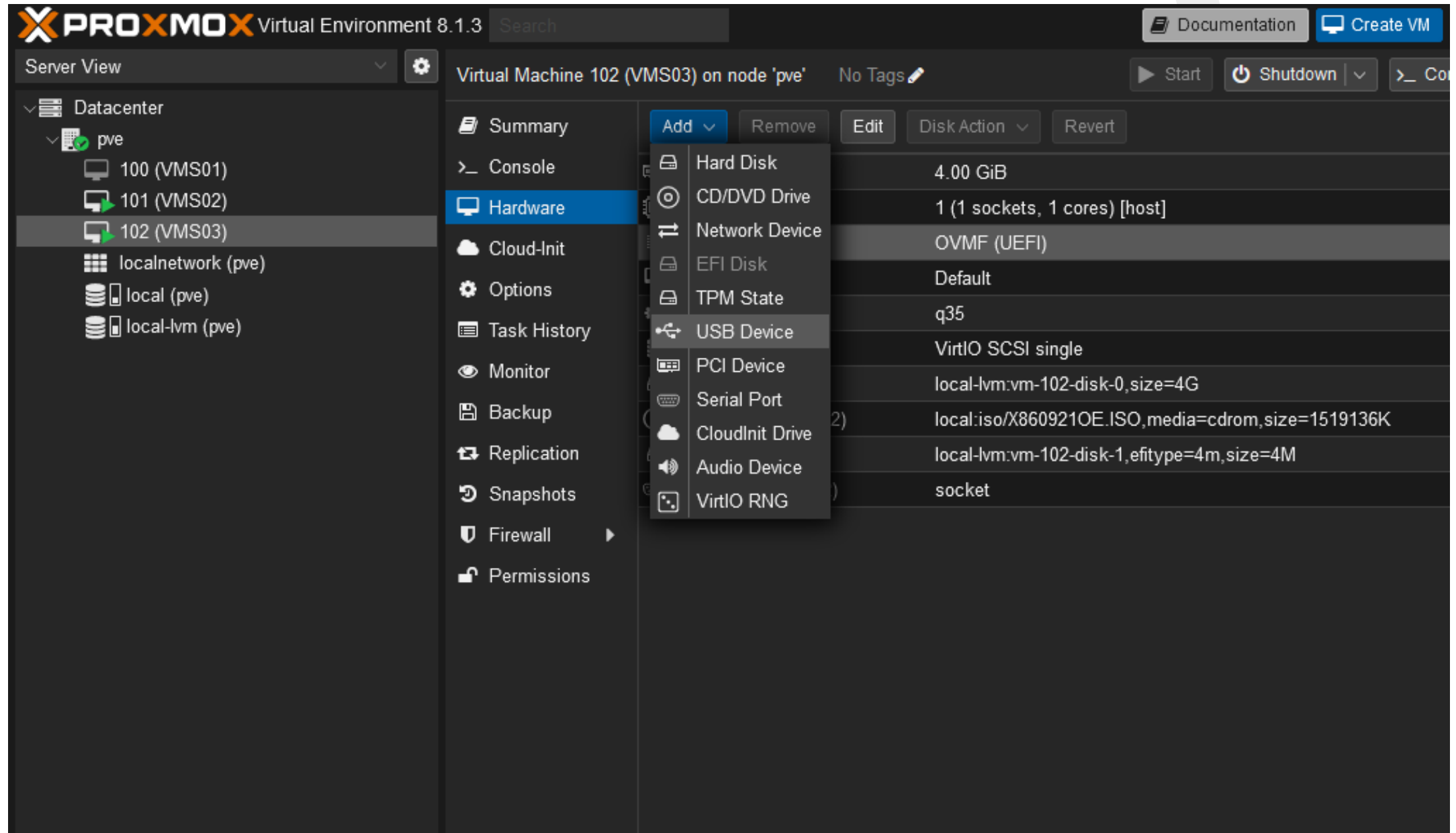
And this is where it gets dirty...

... because, to create a **VMS** VM, you may need to learn **Linux**!

# Creating a new (VMS) VM

- VM creation wizard provided
- Look/usage/options/choices almost identical to ie. ESXi
- No tedious serial console setup needed
- Some pitfalls:
  - Of course, change the BIOS to “OVMF (UEFI)”
  - In the “System” tab, change the machine type to “Q35”
  - In the “CPU” tab, change the CPU type to “host”
  - Start without any network device (select “no network device”) or add option “args: -no-hpet” to VM configuration file
  - Add an EFI Disk with the option “Pre-enrolled keys” deselected
  - Add serial console device

# Adding objects to a VM



The screenshot displays the Proxmox Virtual Environment (VE) 8.1.3 interface. The left sidebar shows the 'Datacenter' view with a tree structure including 'pve' and several VMs (100, 101, 102). VM 102 (VMS03) is selected. The main panel shows the configuration for 'Virtual Machine 102 (VMS03) on node 'pve''. The 'Hardware' tab is active, and the 'Add' dropdown menu is open, listing various hardware components that can be added to the VM. The components listed are: Hard Disk, CD/DVD Drive, Network Device, EFI Disk, TPM State, USB Device, PCI Device, Serial Port, CloudInit Drive, Audio Device, and VirtIO RNG. The right side of the main panel shows the current configuration of the VM, including its name, tags, and various hardware settings like disk size, CPU, memory, and boot order.

Proxmox Virtual Environment 8.1.3

Server View

Virtual Machine 102 (VMS03) on node 'pve' No Tags

Start Shutdown

Summary Console Hardware Cloud-Init Options Task History Monitor Backup Replication Snapshots Firewall Permissions

Add Remove Edit Disk Action Revert

- Hard Disk
- CD/DVD Drive
- Network Device
- EFI Disk
- TPM State
- USB Device
- PCI Device
- Serial Port
- CloudInit Drive
- Audio Device
- VirtIO RNG

4.00 GiB

1 (1 sockets, 1 cores) [host]

OVMF (UEFI)

Default

q35

VirtIO SCSI single

local-lvm:vm-102-disk-0,size=4G

local:iso/X860921OE.ISO,media=cdrom,size=1519136K

local-lvm:vm-102-disk-1,efitype=4m,size=4M

socket

# Running a Proxmox “Cluster”

The screenshot displays the Proxmox Virtual Environment 8.1.3 web interface. The top navigation bar includes the Proxmox logo, version information, a search bar, and links for Documentation, Create VM, and Create CT. The left sidebar shows a tree view of the Datacenter (THL) with two nodes: pve and pve2. The pve node contains VMs 101 (VMS02) and 102 (VMS03), and storage local (pve) and local-lvm (pve). The pve2 node contains VM 100 (VMS01) and storage local (pve2) and local-lvm (pve2). The main panel shows the Cluster Information section, which includes buttons for Create Cluster, Join Information, and Join Cluster. Below this, the Cluster Nodes table lists the nodes and their details.

Server View ⌵ ⚙️ Datacenter

Search

Documentation Create VM Create CT

Server View ⌵ ⚙️ Datacenter

⌵ Datacenter (THL)

- ✓ pve
  - 101 (VMS02)
  - 102 (VMS03)
  - localnetwork (pve)
  - local (pve)
  - local-lvm (pve)
- ✓ pve2
  - 100 (VMS01)
  - localnetwork (pve2)
  - local (pve2)
  - local-lvm (pve2)

Search

Summary

Notes

Cluster

Ceph

Options

Storage

Backup

Replication

Permissions ⌵

- Users
- API Tokens
- Two Factor
- Groups
- Pools
- Roles
- Realms

HA ▶

SDN ⌵

Cluster Information

Create Cluster Join Information Join Cluster

Cluster Name: THL Config Version: 2 Number of Nodes: 2

Cluster Nodes

Nodename	ID ↑	Votes	Link 0
pve	1	1	192.168.146.129
pve2	2	1	192.168.146.139



# Migrating VMs is a button click away

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Component	Specification
Memory	4.00 GiB
Processors	2 (2 sockets, 1 cores) [host,flags=+md-clear]
BIOS	OVMF (UEFI)
Display	Serial terminal 0 (serial0)
Machine	q35
SCSI Controller	VirtIO SCSI single
Hard Disk (sata0)	local-lvm:vm-100-disk-2,backup=0,format=raw,size=4G
CD/DVD Drive (sata1)	none,media=cdrom
Network Device (net0)	e1000=BC:24:11:A6:F1:00,bridge=vbr0,firewall=1
EFI Disk	local-lvm:vm-100-disk-0,efitype=4m,format=raw,pre-enrolled-keys=1,size=528K
Serial Port (serial0)	socket

# Breaking news: Tool to migrate VMs available

- VM import wizard provided
- To date (April 2024), only ESXi supported
- Minimum Proxmox version: 8.1.8
- Tested with ESXi V6.5 - V8
- OVF/OVA support planned
- Uses official public ESXi APIs only

Questions?

