

# Proxmox VE 9 & Debian 13 Air-Gapped Update Guide

This guide describes how to set up an intermediate APT cache on an internet-connected machine (via VirtualBox) and transfer that cache to an air-gapped environment to update Proxmox VE 9 installations.

## Phase 1: VirtualBox Setup (Internet-Facing Host)

On your internet-connected machine, you need two virtual entities: the **Cache Server** and a **Template Proxmox VM** to "pull" the initial data.

### 1.1 Debian 13 (Trixie) Cache VM

1. **Create VM:** 2 vCPUs, 2GB RAM, 50GB+ Disk (depending on how many packages you cache).
2. **Networking:** Use **Bridged Adapter** to ensure it has its own IP on your local network.
3. **OS Installation:** Install a minimal Debian 13 (Netinst). Ensure `SSH server` and `Standard system utilities` are selected.

I did set it up with the hostname `prox-cache` in my lan with the domain `lan.zn80.net` with the IP `192.168.0.240/24`.

When you get asked what to install in addition to the basis system, deselct the `Desktop Environment` and select only `WebServer`, `SSH Server` and `Standard System Utilities`.

After starting the system, enable the `sshd.service`

```
systemctl enable sshd.service
systemctl start sshd.service
```

Also add a static IP address by editing the `/etc/network/interfaces` file:

```
# The primary network interface
allow-hotplug enp0s3
iface enp0s3 inet static
    address 192.168.0.240/24
    gateway 192.168.0.1
```

This should be it for now. Continue with installing the Proxmox-Feeder.

## 1.2 Proxmox VE 9 "Feeder" VM

To populate the cache, you need a machine that requests the specific Proxmox 9 packages.

1. **Create VM:** 2 vCPUs, 4GB RAM, 20GB Disk.
2. **OS Installation:** Install Proxmox VE 9 (or Debian 13 + PVE 9 packages).
3. **Networking:** Ensure it can reach the Debian 13 Cache VM.

I did set it up with the hostname `prox-feeder` in my lan with the domain `lan.zn80.net` with the IP `192.168.0.241/24`.

After installing the proxmox feeder vm we need to configure the in the next steps. Do not update the initial installation yet.

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## Phase 2: Setting up APT-Cacher-NG (Cache Server)

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Before installing the cache, we will optimize the Debian mirror selection to ensure the fastest download speeds.

### 2.1 Optimization: Selecting the Fastest Mirror

Install `netselect-apt` to automatically determine the best mirror for Debian 13.

```
# Install netselect-apt
sudo apt update
sudo apt install netselect-apt -y

# Find the fastest mirror for Debian 13 (Trixie)
# This creates a 'sources.list' file in the current directory
sudo netselect-apt trixie
```

```
# Backup existing sources and apply the new optimized list
sudo mv /etc/apt/sources.list /etc/apt/sources.list.bak
sudo mv sources.list /etc/apt/sources.list
sudo apt update
```

## 2.2 Install and Configure APT-Cacher-NG

Now, install the caching service which will use the fast mirrors selected above.

### Installation

```
sudo apt install apt-cacher-ng -y
```

### Configuration

Edit the configuration to ensure it allows Proxmox repositories:

```
sudo nano /etc/apt-cacher-ng/acng.conf
```

Ensure the following line is active to allow HTTPS tunneling if necessary:

```
PassThroughPattern: .*
```

### Restart Service

```
sudo systemctl restart apt-cacher-ng
```

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## Phase 3: Populating the Cache

On your **Proxmox VE 9 "Feeder" VM**, tell APT to use the Cache Server.

1. Create a proxy configuration file:

```
echo 'Acquire::http::Proxy "http://<IP-OF-CACHE-SERVER>:3142";' | sudo tee /etc/apt/apt.conf.d/00proxy
```

2. Run the updates to pull data into the cache:

```
apt update
apt dist-upgrade -y
^^^
```

```
Now, all downloaded `.deb` files are stored on the Debian 13 Cache VM
in `/var/cache/apt-cacher-ng`.
```

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## Phase 4: Exporting the Cache to the Air-Gapped System

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Since the target system is air-gapped, we must physically move the data.

### 4.1 On the Internet-Connected Cache VM:

Compress the cache data:

```
sudo tar -cvzf pve-cache-export.tar.gz /var/cache/apt-cacher-ng
```

Copy `pve-cache-export.tar.gz` to a USB drive or mobile storage.

### 4.2 On the Air-Gapped Target System:

You need a machine (or LXC container) in the air-gapped network to act as the **Local Cache Server**.

1. Install a Debian 13 LXC or VM on your air-gapped Proxmox.
2. Install `apt-cacher-ng` (you might need to install this manually via `.deb` files once if the container isn't prepared).
3. Import the data:

```
# Extract the data to the correct location
sudo tar -xvzf /path/to/usb/pve-cache-export.tar.gz -C /
sudo chown -R apt-cacher-ng:apt-cacher-ng /var/cache/apt-cacher-ng
sudo systemctl restart apt-cacher-ng
```

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## Phase 5: Configuring Air-Gapped Proxmox Clients

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Now, configure all your air-gapped Proxmox 9 nodes to use the internal cache server.

### 5.1 Set the Proxy

Edit `/etc/apt/apt.conf.d/00proxy` on **every** node:

```
```text
Acquire::http::Proxy "http://<INTERNAL-CACHE-LXC-IP>:3142";
```
```

## 5.2 Update Repository Sources

Ensure your `/etc/apt/sources.list` and `/etc/apt/sources.list.d/pve-enterprise.list` point to standard URLs. Even though there is no internet, `apt-cacher-ng` will trick APT into thinking it's talking to the real servers, while actually serving the files from the local disk.

### Example for Proxmox 9 (No-Subscription):

```
deb
[http://download.proxmox.com/debian/pve](http://download.proxmox.com/debian/pve) trixie pve-no-subscription
```

## 5.3 Run Update

```
apt update
apt dist-upgrade
```

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## Troubleshooting & Maintenance

- **Maintenance:** To update the air-gapped system again, repeat Phase 3 (on the internet host) and Phase 4 (transfer).
- **Disk Space:** Monitor `/var/cache/apt-cacher-ng`. You can use the web interface at `http://<cache-ip>:3142/acng-report.html` to manage the expiration of old packages.

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Soll ich dir noch spezifische Konfigurationsparameter für die Proxmox Enterprise Repositories heraussuchen, falls du diese über den Cache spiegeln möchtest?

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