

# Package Repositories

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Proxmox VE uses [APT](#) as its package management tool like any other Debian-based system.

Proxmox VE automatically checks for package updates on a daily basis. The `root@pam` user is notified via email about available updates. From the GUI, the *Changelog* button can be used to see more details about an selected update.

## Repositories in Proxmox VE

Repositories are a collection of software packages, they can be used to install new software, but are also important to get new updates.



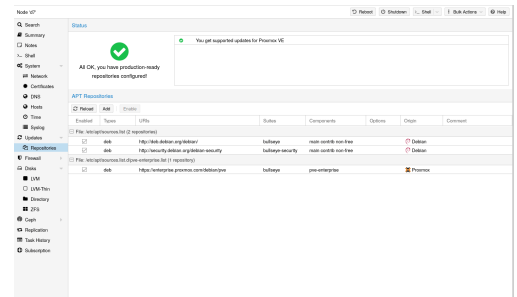
You need valid Debian and Proxmox repositories to get the latest security updates, bug fixes and new features.

APT Repositories are defined in the file `/etc/apt/sources.list` and in `.list` files placed in `/etc/apt/sources.list.d/`.

## Repository Management

Since Proxmox VE 7, you can check the repository state in the web interface. The node summary panel shows a high level status overview, while the separate *Repository* panel shows in-depth status and list of all configured repositories.

Basic repository management, for example, activating or deactivating a repository, is also supported.



## Sources.list

In a `sources.list` file, each line defines a package repository. The preferred source must come first. Empty lines are ignored. A `#` character anywhere on a line marks the remainder of that line as a comment. The available packages from a repository are acquired by running `apt-get update`. Updates can be installed directly using `apt-get`, or via the GUI (Node → Updates).

### File `/etc/apt/sources.list`

```
deb http://deb.debian.org/debian bookworm main contrib
deb http://deb.debian.org/debian bookworm-updates main contrib

# security updates
deb http://security.debian.org/debian-security bookworm-security main contrib
```

Proxmox VE provides three different package repositories.

## Proxmox VE Enterprise Repository

This is the recommended repository and available for all Proxmox VE subscription users. It contains the most stable packages and is suitable for production use. The `pve-enterprise` repository is enabled by default:

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```
deb https://enterprise.proxmox.com/debian/pve bookworm pve-enterprise
```

Please note that you need a valid subscription key to access the **pve-enterprise** repository. We offer different support levels, which you can find further details about at <https://proxmox.com/en/proxmox-virtual-environment/pricing>.



You can disable this repository by commenting out the above line using a **#** (at the start of the line). This prevents error messages if your host does not have a subscription key. Please configure the **pve-no-subscription** repository in that case.

## Proxmox VE No-Subscription Repository

As the name suggests, you do not need a subscription key to access this repository. It can be used for testing and non-production use. It's not recommended to use this on production servers, as these packages are not always as heavily tested and validated.

We recommend to configure this repository in `/etc/apt/sources.list`.

File `/etc/apt/sources.list`

```
deb http://ftp.debian.org/debian bookworm main contrib
deb http://ftp.debian.org/debian bookworm-updates main contrib

# Proxmox VE pve-no-subscription repository provided by proxmox.com,
# NOT recommended for production use
deb http://download.proxmox.com/debian/pve bookworm pve-no-subscription

# security updates
deb http://security.debian.org/debian-security bookworm-security main contrib
```

## Proxmox VE Test Repository

This repository contains the latest packages and is primarily used by developers to test new features. To configure it, add the following line to `/etc/apt/sources.list`:

`sources.list` entry for `pvetest`

```
deb http://download.proxmox.com/debian/pve bookworm pvetest
```



The `pvetest` repository should (as the name implies) only be used for testing new features or bug fixes.

## Ceph Squid Enterprise Repository

This repository holds the enterprise Proxmox VE Ceph 19.2 Squid packages. They are suitable for production. Use this repository if you run the Ceph client or a full Ceph cluster on Proxmox VE.

File `/etc/apt/sources.list.d/ceph.list`

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```
deb https://enterprise.proxmox.com/debian/ceph-squid bookworm enterprise
```

## Ceph Squid No-Subscription Repository

This Ceph repository contains the Ceph 19.2 Squid packages before they are moved to the enterprise repository and after they where on the test repository.



It's recommended to use the enterprise repository for production machines.

File `/etc/apt/sources.list.d/ceph.list`

```
deb http://download.proxmox.com/debian/ceph-squid bookworm no-subscription
```

## Ceph Squid Test Repository

This Ceph repository contains the Ceph 19.2 Squid packages before they are moved to the main repository. It is used to test new Ceph releases on Proxmox VE.

File `/etc/apt/sources.list.d/ceph.list`

```
deb http://download.proxmox.com/debian/ceph-squid bookworm test
```

## Ceph Reef Enterprise Repository

This repository holds the enterprise Proxmox VE Ceph 18.2 Reef packages. They are suitable for production. Use this repository if you run the Ceph client or a full Ceph cluster on Proxmox VE.

File `/etc/apt/sources.list.d/ceph.list`

```
deb https://enterprise.proxmox.com/debian/ceph-reef bookworm enterprise
```

## Ceph Reef No-Subscription Repository

This Ceph repository contains the Ceph 18.2 Reef packages before they are moved to the enterprise repository and after they where on the test repository.



It's recommended to use the enterprise repository for production machines.

File `/etc/apt/sources.list.d/ceph.list`

```
deb http://download.proxmox.com/debian/ceph-reef bookworm no-subscription
```

## Ceph Reef Test Repository

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This Ceph repository contains the Ceph 18.2 Reef packages before they are moved to the main repository. It is used to test new Ceph releases on Proxmox VE.

File `/etc/apt/sources.list.d/ceph.list`

```
deb http://download.proxmox.com/debian/ceph-reef bookworm test
```

## Ceph Quincy Enterprise Repository

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This repository holds the enterprise Proxmox VE Ceph Quincy packages. They are suitable for production. Use this repository if you run the Ceph client or a full Ceph cluster on Proxmox VE.

File `/etc/apt/sources.list.d/ceph.list`

```
deb https://enterprise.proxmox.com/debian/ceph-quincy bookworm enterprise
```

## Ceph Quincy No-Subscription Repository

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This Ceph repository contains the Ceph Quincy packages before they are moved to the enterprise repository and after they were on the test repository.



It's recommended to use the enterprise repository for production machines.

File `/etc/apt/sources.list.d/ceph.list`

```
deb http://download.proxmox.com/debian/ceph-quincy bookworm no-subscription
```

## Ceph Quincy Test Repository

---

This Ceph repository contains the Ceph Quincy packages before they are moved to the main repository. It is used to test new Ceph releases on Proxmox VE.

File `/etc/apt/sources.list.d/ceph.list`

```
deb http://download.proxmox.com/debian/ceph-quincy bookworm test
```

## Older Ceph Repositories

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Proxmox VE 8 doesn't support Ceph Pacific, Ceph Octopus, or even older releases for hyper-converged setups. For those releases, you need to first upgrade Ceph to a newer release before upgrading to Proxmox VE 8.

See the respective [upgrade guide](#) for details.

## Debian Firmware Repository

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Enable this repository if you want to set up [Early OS Microcode Updates](#) or need additional [Runtime Firmware Files](#) not already included in the pre-installed package `pve-firmware`.

To be able to install packages from this component, run `editor /etc/apt/sources.list`, append `non-free-firmware` to the end of each `.debian.org` repository line and run `apt update`.

## SecureApt

The *Release* files in the repositories are signed with GnuPG. APT is using these signatures to verify that all packages are from a trusted source.

If you install Proxmox VE from an official ISO image, the key for verification is already installed.

If you install Proxmox VE on top of Debian, download and install the key with the following commands:

```
# wget https://enterprise.proxmox.com/debian/proxmox-release-bookworm.gpg -O
/etc/apt/trusted.gpg.d/proxmox-release-bookworm.gpg
```

Verify the checksum afterwards with the `sha512sum` CLI tool:

```
# sha512sum /etc/apt/trusted.gpg.d/proxmox-release-bookworm.gpg
7da6fe34168adc6e479327ba517796d4702fa2f8b4f0a9833f5ea6e6b48f6507a6da403a274fe201595edc86a84463d50383d07f64bd
de2e3658108db7d6dc87 /etc/apt/trusted.gpg.d/proxmox-release-bookworm.gpg
```

or the `md5sum` CLI tool:

```
# md5sum /etc/apt/trusted.gpg.d/proxmox-release-bookworm.gpg
41558dc019ef90bd0f6067644a51cf5b /etc/apt/trusted.gpg.d/proxmox-release-bookworm.gpg
```

## Proxmox VE 7.x Repositories

Proxmox VE 7.x is based on Debian 11.x (“bullseye”). Please note that this release is out of date (see the [FAQ support table](#)). Existing installations should be updated. Nevertheless access to these repositories is still provided.

Repository	sources.list entry
Proxmox VE 7.x Enterprise	<code>deb https://enterprise.proxmox.com/debian/pve bullseye pve-enterprise</code>
Proxmox VE 7.x No-Subscription	<code>deb http://download.proxmox.com/debian/pve bullseye pve-no-subscription</code>
Proxmox VE 7.x Test	<code>deb http://download.proxmox.com/debian/pve bullseye pvetest</code>

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Release key URL: <https://enterprise.proxmox.com/debian/proxmox-release-bullseye.gpg>

Release key hash sums:

```

sha512sum /etc/apt/trusted.gpg.d/proxmox-release-bullseye.gpg
7fb03ec8a1675723d2853b84aa4fdb49a46a3bb72b9951361488bfd19b29aab0a789a4f8c7406e71a69aabbcb727c936d3549731c4659
ffa1a08f44db8fdcebfa

md5sum /etc/apt/trusted.gpg.d/proxmox-release-bullseye.gpg
bcc35c7173e0845c0d6ad6470b70f50e

```

## Proxmox VE 6.x Repositories

Proxmox VE 6.x is based on Debian 10.x (“buster”). Please note that this release is out of date. Existing installations should be updated. Nevertheless access to these repositories is still provided.

Repository	sources.list entry
Proxmox VE 6.x Enterprise	deb <a href="https://enterprise.proxmox.com/debian/pve">https://enterprise.proxmox.com/debian/pve</a> buster pve-enterprise
Proxmox VE 6.x No-Subscription	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> buster pve-no-subscription
Proxmox VE 6.x Test	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> buster pvetest

## Proxmox VE 5.x Repositories

Proxmox VE 5.x is based on Debian 9.x (“stretch”). Please note that this release is out of date. Existing installations should be updated. Nevertheless access to these repositories is still provided.

Repository	sources.list entry
Proxmox VE 5.x Enterprise	deb <a href="https://enterprise.proxmox.com/debian/pve">https://enterprise.proxmox.com/debian/pve</a> stretch pve-enterprise
Proxmox VE 5.x No-Subscription	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> stretch pve-no-subscription
Proxmox VE 5.x Test	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> stretch pvetest

## Proxmox VE 4.x Repositories

Proxmox VE 4.x is based on Debian 8.x (“jessie”). Please note that this release is out of date. Existing installations should be updated. Nevertheless access to these repositories is still provided.

Repository	sources.list entry
Proxmox VE 4.x Enterprise	deb <a href="https://enterprise.proxmox.com/debian/pve">https://enterprise.proxmox.com/debian/pve</a> jessie pve-enterprise
Proxmox VE 4.x No-Subscription	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> jessie pve-no-subscription
Proxmox VE 4.x Test	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> jessie pvetest

## Proxmox VE 3.x Repositories

Proxmox VE 3.x is based on Debian 7.x (“wheezy”). Please note that this release is out of date. Existing installations should be updated. Nevertheless access to these repositories is still provided.

Repository	sources.list entry
Proxmox VE 3.x Enterprise	deb <a href="https://enterprise.proxmox.com/debian/pve">https://enterprise.proxmox.com/debian/pve</a> wheezy pve-enterprise
Proxmox VE 3.x No-Subscription	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> wheezy pve-no-subscription
Proxmox VE 3.x Test	deb <a href="http://download.proxmox.com/debian/pve">http://download.proxmox.com/debian/pve</a> wheezy pvetest

## Outdated: stable Repository pve

This repository is a leftover to ease the update to 3.1. It will not get any updates after the release of 3.1. Therefore the repository needs to be removed after the upgrade to 3.1.

File `/etc/apt/sources.list`

```
deb http://ftp.debian.org/debian wheezy main contrib
# PVE packages provided by proxmox.com - NO UPDATES after the initial release of 3.1
# deb http://download.proxmox.com/debian wheezy pve
# security updates
deb http://security.debian.org/ wheezy/updates main contrib
```

## Outdated: Proxmox VE 2.x Repositories

Proxmox VE 2.x is based on Debian 6.0 (“squeeze”) and outdated. Please upgrade to the latest version as soon as possible. In order to use the stable pve 2.x repository, check your sources.list:

File `/etc/apt/sources.list`

```
deb http://ftp.debian.org/debian squeeze main contrib
# PVE packages provided by proxmox.com
deb http://download.proxmox.com/debian squeeze pve
# security updates
deb http://security.debian.org/ squeeze/updates main contrib
```

## Outdated: Proxmox VE 1.x Repositories

Proxmox VE 1.x is based on Debian 5.0 (“lenny”) and very outdated. Please upgrade to latest version as soon as possible.

Retrieved from "[https://pve.proxmox.com/mediawiki/index.php?title=Package\\_Repositories&oldid=12085](https://pve.proxmox.com/mediawiki/index.php?title=Package_Repositories&oldid=12085)"

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