

1. Backup Storage Locations

Now, installing Proxmox backup server and another TrueNas Scale instance is not really the problem. If you have already set up PVE and TrueNas scale then it is super simple. The real culprit is where to store the backup data. We will discuss the different storage locations and tell with each option what the advantages and disadvantages are. It is then up to you which storage locations to choose for your setup.

We will discuss solutions if you only have one machine, two or three machines to your disposal ;)

- [1. Same PVE machine same drives \(Requires 1 Machine\)](#)
- [2. Same PVE Machine Dedicated Drives \(Requires 1 Machine\)](#)
- [3. Dedicated TrueNas scale with virtual PBS \(Requires 2 machines\)](#)
- [4. Dedicated PVE & TrueNas Backup, Virtual Truenas Scale VM, and PBS Container \(Requires 3 machines\)](#)
- [5. Dedicated PVE, TrueNas, PBS, Truens Backup \(Requires 4 machines\)](#)

1. Same PVE machine same drives (Requires 1 Machine)

The first backup strategy we will execute is the simplest but also the most vulnerable one. This means you store your backup on the same hard drives you also run your production system on. This is highly discouraged but for completeness we will still discuss it if you don't have other storage drives to your disposal.

2. Same PVE Machine

Dedicated Drives (Requires 1 Machine)

In this strategy we will use different storage drives for our backups. We assume a Proxmox environment from which you want to backup the virtual machines. What we will do is

1. Create a Proxmox PBS VM on our main PVE machine
2. Pass through the drives to the PBS VM (1 drive would suit but a mirrored pool would of course be best). This prevents the ZFS on top of ZFS problem.
3. Then schedule backup jobs to our PBS on the same machine but stored on separate drives

This method is especially great if you have a system that allows for multiple drives for storage. For instance an ATX case would be great for this. You could have for instance a mirrored ZFS pool for production and then a third drive or mirrored pool dedicated solely to backups. So yes if you just have a small mini pc that has no options for drive expansion then this method won't be for you.

Pass Through the Drives

Benefits

Performance Impact: A PBS VM on the same system can experience noticeable performance degradation during large backup operations, as it competes for disk I/O and CPU cycles with production workloads. A bare metal PBS system provides guaranteed performance without contention.

Reliability: With a bare metal deployment, if your production hypervisor or its storage fails, your backups remain completely separate and accessible. A VM-based approach creates a single point of failure at the host level.

Practical Trade-offs: The VM approach makes sense for smaller deployments where backup windows are outside peak production hours and where cost is a primary concern. Bare metal becomes more attractive as your backup volume grows or if downtime tolerance is very low.

Enhanced Data Protection

- **Isolation from Hardware Failures:** Storing backups on separate drives protects against data loss due to hardware failures or corruption in the production environment.
- **Corruption Prevention:** If the production drives become corrupted, backups on different drives remain intact and accessible.

Improved Security

- **Threat Isolation:** Keeping backups on different drives enhances security by isolating them from potential threats that may affect the production environment.
- **Access Control:** This separation allows for stricter access controls, reducing the risk of unauthorized access to backup data.

Backup Integrity

- **Consistent Availability:** Backups stored on different drives ensure that they are available even if the primary system experiences downtime or issues.
- **Disaster Recovery:** In the event of a disaster, having backups on separate drives facilitates quicker recovery processes, minimizing downtime.

3. Dedicated TrueNas scale with virtual PBS (Requires 2 machines)

Here we will setup PBS on top of Truenas Scale as a container. Why would you do this ? well if you run both proxmox pve and run a Truenas VM or bare metal then you have two different systems to backup. You want to backup your VM's and you want to back up your TrueNas datasets. Both are optimised for running a second bare metal Proxmox PBS and a bare metal Truenas instance. However, this means you need to get two devices. The middle ground is get 1 extra host where TrueNas and PBS both have direct access to the zfs pools instead of having ZFS on top of ZFS.

Source: [Why run PBS on Truenas ?](#)

4. Dedicated PVE & TrueNas Backup, Virtual Truenas Scale VM, and PBS Container (Requires 3 machines)

This setup is the most robust setup but is also the most expensive setup and often not necessary for a home lab. This setup basically has

1. Dedicated PVE instance
2. Truenas Scale installed on the PVE instance as a VM with passed through drives
3. Dedicated Truenas Scale backup machine
4. Dedicated Proxmox Backup server machine

We will not go into discussing setting this up since there is no difference in installation that we not already discussed before. It is just included for completeness to show how professional environments are setup. However,

5. Dedicated PVE, TrueNas,
PBS, Truens Backup
(Requires 4 machines)