

# Ultimate Server Guide

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# Create ZFS "folders" aka dataset

**Run this command to create a ZFS Dataset**

```
zfs create rpool/config/<containername>
```

**Run this command to destroy a ZFS Dataset**

```
zfs destroy rpool/config/<containername>
```

# New Proxmox / Docker Server Deployment guide

## Deployment Summary

Here, we will document the general steps to deploy a Proxmox / Docker setup.

- Install Proxmox Development Environment.
- Fix the repositories. We need to remove the enterprise repos and add the no-subscription repos

```
nano /etc/apt/sources.list.d/pve-enterprise.list
```

Comment out the enterprise entry with # and save

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

Comment out the entry here as well.

```
nano /etc/apt/sources.list
```

Check one of my running servers to see what it has, but my newer one has this

```
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
```

```
deb http://download.proxmox.com/debian/pve bullseye pve-no-subscription
```

- Update and Upgrade the server

```
apt update && apt upgrade
```

### Possibly important, maybe not

This below command- I'm not sure it makes sense, so I wouldn't run it, but Allyn gave it to me so it may be necessary. I'm confused because it says apt-get install when we never use apt-get.

```
apt update && apt upgrade -y && reboot apt-get install -y apt-transport-https ca-certificates curl gnupg2  
software-properties common
```

- Uhh, adds some docker repo key? Fuck if I know.

```
curl -fsSL https://download.docker.com/linux/debian/gpg | apt-key add -
```

- Add the Docker Repo, so we can install docker.

```
add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/debian $(lsb_release -cs) stable"
```

- If using ZFS, create mount points for rpool/docker. If you aren't, skip this step.

```
zfs create -o mountpoint=/var/lib/docker rpool/docker
```

```
zfs create -o mountpoint=/config rpool/config
```

```
mkdir /etc/systemd/system/docker.service.d
```

```
nano /etc/systemd/system/docker.service.d/storage-driver.conf
```

```
[Service]  
ExecStart=  
ExecStart=/usr/bin/dockerd --storage-driver=zfs -H fd://
```

- Install Docker via the following command

```
apt update && apt install docker-ce docker-ce-cli containerd.io -y
```

- Check Storage Driver - probably checking to see if ZFS is the Storage Driver. Only applicable if you use ZFS.

docker info | grep Storage

## Installing Portainer

- Create a ZFS pool for Portainer. This enables ZFS features for the container.

```
zfs create rpool/config/portainer
```

- Install Portainer by running this command

```
docker run -d -p 8000:8000 -p 9000:9000 -p 9443:9443 --name=portainer --restart=always -v /var/run/docker.sock:/var/run/docker.sock -v /config/portainer:/data portainer/portainer-ce:latest
```

## Installing Portainer App Templates

- Install the following URL into the App Templates area in Portainer Settings.

<https://raw.githubusercontent.com/ntv-one/portainer/main/template.json>

<https://raw.githubusercontent.com/portainer/templates/master/templates-2.0.json> - this was mine  
idk

# PROXMOX Nag Screen Removal

Run the following command in the proxmox terminal

```
sed -Ezi.bak "s/(Ext.Msg.show\\(\\{\\s+title: gettext\\('No valid sub)/void\\(\\{ V\\1/g" /usr/share/javascript/proxmox-widget-toolkit/proxmoxlib.js && systemctl restart pveproxy.service
```

# PROXMOX VM Tips

## Help! My VM won't shutdown!

- Stop the current shutdown task by clicking on the task in the Tasks List
- Press Stop
- Click the dropdown next to Shutdown in the top right and select "Stop"

## Help! My VM randomly suspends!

- Edit Power Plan in Windows to never sleep hard disks and never sleep display

## Help! My game crashes without warning!

- Ensure your VM has actual RAM size defined accordingly ([RAMSIZE] x 1024): (ex: 4096/8192) - RECOMMENDED 16GB (**16384MB**) **minimum!**
- Set processor type to "host" on Proxmox VM

## Increase the hard drive space of a PROXMOX VM:

1. Shut down the VM
2. Run the command: (Example: qm resize 100 ide0 +150G)
3. 

```
qm resize [VM_ID] [DISK_NAME] +[SIZE_INCREASE]G
```
4. Start the VM
5. Go into Disk Management, right-click the drive you want to add the additional storage to and press extend volume
6. *As a general rule. Windows only allows you to extend partitions that are **next** to each other. If your new unallocated volume is NOT physically next to your main partition, you will have to use a third party tool to "move" it next to it. I recommend >*

<https://www.diskpart.com/download-home.html> < The free version of this software has a solid and tested feature to re-arrange partitions on a physical drive. After using this tool to move your partition structure, you should now be able to complete 5.

7. Send it.

- **In order to decrease the size of your VM volume, do these steps in reverse.**

- Shrink the volume in windows
- Write down the amount of space you shrunk the volume by in G

- ```
qm resize [VM_ID] [DISK_NAME] -[SIZE_INCREASE]G
```

# Setting up SAMBA



# VFIO "GPU Passthrough"

## Guide for Proxmox

### BIOS Settings:

- Disable Above 4G
- Disable ReBAR
- Disable SR-IOV (Leave this enabled if using a Quadro or other SR-IOV enabled graphics accelerator)
- Enable IOMMU Support
- Enable VT-d
- Ensure primary output in BIOS is set to iGPU (NOT AUTO)

### Proxmox Kernel Version:

- Ensure Proxmox is running on kernel version 6.0.2 or later -

```
pveversion -v
```

- Update Proxmox -

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

### Proxmox Config:

```
nano /etc/kernel/cmdline
root=ZFS=rpool/ROOT/pve-1 boot=zfs
Change to:
For Intel:
root=ZFS=rpool/ROOT/pve-1 boot=zfs quiet intel_iommu=on
For AMD:
root=ZFS=rpool/ROOT/pve-1 boot=zfs quiet amd_iommu=on
```

- Update the Proxmox Kernel Commandline to boot with IOMMU Support
- Enable IOMMU in Proxmox

- `nano /etc/default/grub`  
Comment out `#GRUB_CMDLINE_LINUX_DEFAULT="quiet"`  
Replace with  
`GRUB_CMDLINE_LINUX_DEFAULT="quiet intel_iommu=on"` - For Intel  
`GRUB_CMDLINE_LINUX_DEFAULT="quiet AMD_iommu=on"` - For AMD  
Save  
`update-grub`

- Add Kernel Modules

- `nano /etc/modules`  
`vfio`  
`vfio_iommu_type1`  
`vfio_pci`  
`vfio_virqfd`

- Blacklist GPU drivers from loading on root Proxmox (may be needed)

- `nano /etc/modprobe.d/blacklist.conf`  
`blacklist nvidia`  
`blacklist nouveau`  
`blacklist radeon`  
`blacklist amd`

- Ensure your GPU is in a SEPARATE IOMMU GROUP

- `lspci -v`  
- Find the group number with your GPU  
`find /sys/kernel/iommu_groups/ -type l`  
If you do notice that the GPU you're using is in the same group as another device, run the command below to attempt to isolate the device then reboot Proxmox and run the steps above again to verify.  
`echo "options vfio_iommu_type1 allow_unsafe_interrupts=1" >`  
`/etc/modprobe.d/iommu_unsafe_interrupts.conf`

- Reboot

## Virtual Machine Configuration:

- Boot VM normally and setup Remote Desktop
- Shutdown VM
- Ensure BIOS Type is set to OVMF (UEFI)
- Ensure Memory does not have Ballooning Device enabled
- Add the GPU by selecting Add > PCI Device > Select your GPU (Ensure it is the proper IOMMU group as discovered with `lspci -v`)

- Ensure that All fuctions, ROM-bar, Primary GPU, and PCI-Express are all enabled.
  - Change Display Type to NONE
  - Log in via Remote Desktop
  - Install Graphics Card Drivers
  - Reboot.
- 
- Enjoy.

# Updating Portainer

## From Proxmox:

```
docker stop portainer
docker remove portainer
docker pull portainer/portainer-ce:latest
docker run -d -p 8000:8000 -p 9000:9000 -p 9443:9443 --name=portainer --restart=always -v
/var/run/docker.sock:/var/run/docker.sock -v /config/portainer:/data portainer/portainer-ce:latest
```

## IF YOU ACCIDENTALLY UPGRADE TO EE (Business Edition):

```
docker stop portainer
docker run -it --name portainer-database-rollback -v /config/portainer:/data portainer/portainer-ee:latest --
rollback-to-ce
docker run -d -p 8000:8000 -p 9000:9000 -p 9443:9443 --name=portainer --restart=always -v
/var/run/docker.sock:/var/run/docker.sock -v /config/portainer:/data portainer/portainer-ce:latest
```

# Postgresql

\l < list databases

create database:

```
CREATE DATABASE database;
```

delete database:

```
DROP DATABASE database;
```

grant admin to user on new db:

```
GRANT ALL PRIVILEGES ON DATABASE database TO user;
```

# Checkpoints and Snapshots for ZFS

Zpool checkpoint rpool



**malventano**

Snapshot rpool before you swap it.  
Actually do a checkpoint of rpool before you swap.



**Fifthdread**

I know these words but I've never done it  
I can look it up  
lol



**malventano**

Zpool checkpoint rpool



**Fifthdread**

ez



**malventano**

A checkpoint is like a big daddy snapshot of a whole zpool.  
Can only do one and have to remove it before you do some other zpool operations.  
It's like an 'I might break some shit' snapshot.  
Hell I'd checkpoint both of your pools before you do the swap.



**Fifthdread**

awesome. Thanks bro. Adding it to the wiki  
this isn't my big boi server it's my secondary one, so the most I'd lose is... not too much.



**malventano**

14:57

Well sure. Use it for practice.



# Backups

Backups are accomplished differently depending on the server.

Proxmox1 uses **Duplicati**

Proxmox2 uses **rsync**

## Rsync & crontab

Using the below command, you can see the rsync commands which backup docker.

```
crontab -e
```

Below is an example configuration.

```
# Palworld Hourly Backup
0 * * * * rsync -aAX --delete --exclude '*.recycle' --exclude 'rsync' /config/palworld/Pal/Saved
/config/rsync/backups/palworld/palworld_$(date +%FT%H%M%z)

# Daily Rolling Backup at 1am
00 01 * * * rsync -aAX --delete --exclude '*.recycle' --exclude 'rsync' /config/ /config/rsync/backups/daily/daily

# Weekly Backup at 2pm on Friday
00 02 * * 5 rsync -aAX --delete --exclude '*.recycle' --exclude 'rsync' /config/
/config/rsync/backups/weekly/weekly_$(date +%FT%H%M%z)

# Monthly Backup at 3am on 1st of the month
00 03 1 * * rsync -aAX --delete --exclude '*.recycle' --exclude 'rsync' /config/
/config/rsync/backups/monthly/monthly_$(date +%FT%H%M%z)
```

[This website](#) can help setup various timings for when to run rsync.

Note that cron jobs require a leading slash ahead of % symbols. Example: date  
+\\%FT\\%H\\%M\\%z



Note that an empty line is required below the crontab -e file

# Directory Tree Scanner - qdirstat - windirstat alternative

Directory Tree Scanner - qdirstat - windirstat alternative

# Docker Network Limit fix

nano edit the below file

/etc/docker/daemon.json

```
{
  "log-level": "warn",
  "log-driver": "json-file",
  "log-opts": {
    "max-size": "10m",
    "max-file": "5"
  },
  "default-address-pools": [
    {
      "base": "172.16.0.0/12",
      "size": 24
    }
  ],
  "runtimes": {
    "nvidia": {
      "path": "nvidia-container-runtime",
      "runtimeArgs": []
    }
  }
}
```

Save, restart docker

service docker restart

then maybe restart containers and stacks

# Add Pfetch and fastfetch to proxmox along with making it run at start

```
apt install unzip && wget https://github.com/dylanaraps/pfetch/archive/master.zip && unzip master.zip && install pfetch-master/pfetch /usr/local/bin/ && ls -l /usr/local/bin/pfetch && echo -e "\n# Add pfetch command\npfetch" >> ~/.bashrc
```

```
cd ~/ && wget https://github.com/fastfetch-cli/fastfetch/releases/download/2.20.0/fastfetch-linux-amd64.tar.gz && tar -xf fastfetch-linux-amd64.tar.gz && mkdir /root/bin/ && cp ~/fastfetch-linux-amd64/usr/bin/* /bin/
```

# Proxmox Power Savings / CPU Governor

<https://tteck.github.io/Proxmox/#proxmox-ve-cpu-scaling-governor>

<https://community.home-assistant.io/t/psa-how-to-configure-proxmox-for-lower-power-usage/323731/27>

Proxmox ships with Performance Governor by default, and you may want to change it to save power.

```
bash -c "$(wget -qLO - https://github.com/tteck/Proxmox/raw/main/misc/scaling-governor.sh)"
```

# ZSH customize without OhMyZSH

```
git clone --depth=1 https://gitee.com/romkatv/powerlevel10k.git ~/powerlevel10k && echo 'source  
~/powerlevel10k/powerlevel10k.zsh-theme' >> ~/.zshrc
```