

Promox VE

Proxmox VE is an open-source server management platform for your enterprise virtualization. It tightly integrates KVM hypervisor and LXC, software-defined storage, and networking functionality on a single platform. With the integrated web-based user interface you can easily manage VMs and containers, highly available clusters, or the integrated disaster recovery tools with ease.

- [HumHub](#)
 - [HumHub Install with Turnkey LAMP on Proxmox](#)
- [Install and Setup Proxmox VE](#)
- [Access Proxmox Server Remotely - Virtual Console not Loading](#)
- [Setup and Install Docker in a Promox LXC Conainer](#)
- [Setup and Install Docker in a Promox 7 LXC Conainer](#)
- [Add External USB Storage to Proxmox](#)
- [Enable Proxmox TFA Two Factor Authentication](#)
- [How to list VMs and Containers in Proxmox](#)

HumHub

HumHub Install with Turnkey LAMP on Proxmox

HumHub is a free and open-source social network software written on top of the Yii PHP framework that provides an easy to use toolkit for creating and launching your own social network.



Install the Turnkey LAMP in a new LXC:

1. Click on your preferred storage on the left side of Proxmox
2. Click on CT Templates then Templates
3. Search for Turnkey LAMP and download

Launch a new CT with the Turnkey LAMP template and install. Once finished, log in as root and password.

Run apt update

Download [HumHub](#)

Extract the files

Use [WinSCP](#) (from Windows remotely) or terminal locally to access the directory var/www with the root LXC credentials.

Drop the HumHub files into the www directory



When files are done uploading give write access to the assets folder using CHMOD.

Run the following command in the terminal of the LXC to update PHP and install plugins. I tried running HumHub on php 7.3 and ran into a slew of issues when trying to run the cronjobs. PHP version 8 seems to do the job.

```
apt update
apt install -y php8.0-{mysql,cli,common,snmp,ldap,curl,mbstring,zip} -y
```

Navigate to Adminer on the machine IP https: on port 12322

1. Adminer; login as MySQL username **adminer**: password: **your LXC root pass**
https://12.34.56.789:12322 - Adminer database management web app
2. Create the HumHub database and a new user with full privileges

File permissions

At least following directories and files needs to be **writable** by the PHP process:

- /assets
- /protected/config/
- /protected/modules
- /protected/runtime
- /uploads/*

```
chown -R www-data:www-data /var/www/humhub
```

If you want to use the HumHub automatic updater, all files must be writable.

Navigate to the machine IP on https and begin the installer.

If you see any missing PHP plugins, just google for them and it's pretty basic. Just tedious and takes time but you should be good to go other than a couple image plugins that you most likely wont need.

Enter your database connection info using localhost as the db host. I had to create a new user and give it privileges in Adminer to get it to work but it only takes a few seconds.

Be sure to make a snapshot or backup in Proxmox right after the initial setup and admin account is created. This way if you break something, you can just roll back to a fresh start.

Extra:

You may want to up the max image/video size from 8M. You can do this by going to /etc/php/8.0 then edit the php.ini values. PHP version may be different when you install but that will be where the php.ini file is stored. Change the below values by using WinSCP (on a Windows machine), open the file and hit CTRL F to find them. You can use vim or nano in your terminal to edit the file just as easy. Whatever you prefer.

```
upload_max_filesize = 200M
post_max_size = 200M
```

Be sure to save the php.ini and exit. If you upload larger videos, be sure to make the sizes larger to accommodate that.

Cron Jobs

Asynchronous jobs in HumHub are used to run potentially heavy or scheduled tasks such as sending out summary mails, notifications or search index optimization. If not setup, you will see a warning message on your site. It won't effect your posting but without setting them up, your posts will not be indexed and searchable.

image not found or type unknown



```
php /var/www/protected/yii cron/run
```

```
php /var/www/protected/yii queue/run
```

Add the above commands to crontab.

You can run the commands manually once to clear the warning message off your site.

```
crontab -e
```

Scroll to the bottom and add the following commands.

```
0 * * * * php /var/www/protected/yii cron/run
*/10 * * * * php /var/www/protected/yii queue/run
```

This means if you add something to your site right after the cronjobs run, you will have to wait 10 minutes before they will show up in search results.

Save and exit.

Did you find this helpful? [Subscribe to me on Youtube](#) for more content!

Install and Setup Proxmox VE

This guide will explain how to install Proxmox VE on a bare metal system. You don't need a fancy server to run Proxmox.

Recommended Hardware

- Intel EMT64 or AMD64 with Intel VT/AMD-V CPU flag.
- Memory, minimum 2 GB for OS and Proxmox VE services. Plus designated memory for guests. For Ceph or ZFS additional memory is required, approximately 1 GB memory for every TB used storage.
- Fast and redundant storage, best results with SSD disks.
- OS storage: Hardware RAID with batteries protected write cache (“BBU”) or non-RAID with ZFS and SSD cache.
- VM storage: For local storage use a hardware RAID with battery backed write cache (BBU) or non-RAID for ZFS. Neither ZFS nor Ceph are compatible with a hardware RAID controller. Shared and distributed storage is also possible.
- Redundant Gbit NICs, additional NICs depending on the preferred storage technology and cluster setup – 10 Gbit and higher is also supported.
- For PCI(e) passthrough a CPU with VT-d/AMD-d CPU flag is needed.

Here, you can see more on [Proxmox hardware requirements](#).

Install Proxmox VE

An album with all of the following screenshots can be found here: <https://imgur.com/a/ISg9Lzt>

1. The first step to installing Proxmox is downloading the installation ISO (<https://i.imgur.com/76OXS2L>) from their website (<https://www.proxmox.com/en/downloads>), and make a bootable USB stick out of it. For this tutorial, we assume you know how to do this.
2. Make sure virtualization support is turned on in the BIOS of the server. The Intel version of this is called VT-d or VT-x. The AMD version is called AMD-V. If your server for some reason does not support this, you can unfortunately not make use of the full power of

Proxmox. Unfortunately, this is probably the hardest part of the tutorial. Turning virtualization support on will be different on every server/motherboard thus making it very difficult for us to show how this is done. Usually this option is turned on by default, but it is a good idea to check this. You can google “[motherboard name] virtualization bios” to see how to do this for your specific motherboard.

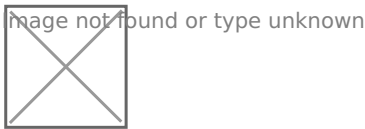
3. Insert the earlier created bootable USB drive into the server and boot from it. You should see this (<https://imgur.com/tHEP7u8>) screen.
4. Now press [Enter] on “Install Proxmox VE”. After a few seconds you should see a screen with the user licence agreement (<https://imgur.com/B02f7a3>). After reading the User Licence Agreement, press “I agree”.
5. Now select the physical disk you want to install Proxmox on next to “Target-Harddisk”. We recommend NOT installing Proxmox on a USB device. Unlike some hypervisor operating systems you may have heard of, Proxmox does not run from memory. This means that if you install Proxmox on a USB drive, it will cause a lot of wear, and your USB drive might fail sooner than expected[3]. Press “Next” after selecting the right hard drive. (<https://imgur.com/cNC3S9U>)
6. Enter your Country, Time zone and Keyboard Layout accordingly. Press “Next”. (<https://imgur.com/UI5IyoN>)
7. Enter a password for your root account with a valid email address. This email address will be used by Proxmox for important notifications. Press “Next”. (<https://imgur.com/tmJmwJa>)
8. Enter your preferred network settings. Proxmox should automatically detect these settings, so you can press “next” without changing anything, and it should work fine. (<https://imgur.com/vyjH51z>). For now, we will not make any changes to these settings.
9. The next step of the installation will be a summary of your settings. Make sure they are all ok and then press install. ProxMox will now install itself on the selected hard drive (<https://imgur.com/0g3BDLr>).
10. The last screen of the installation should say that it was a success. Press “Reboot”. (<https://imgur.com/h1TIMXo>)
11. After the system reboots, you will see a blue screen with several startup options. Do not press any button. Proxmox will continue to boot normally after a few seconds. (<https://imgur.com/Vy5O8oe>)
12. The next screen should be a console showing the IP address chosen during the installation of Proxmox. To access the Proxmox UI, use a browser on a different computer on the same network to navigate to the IP Address and the specified port as shown on the Proxmox server. Make sure to use “https” as well. (<https://imgur.com/G8TzBkf>)
13. Once you access the Proxmox UI on another computer in the same network you will be greeted with a login screen (<https://imgur.com/5zFcC0I>). Log in with the username “root” and the password you chose during the installation. Congratulations, your Proxmox install is now complete and working.

This guide was sited from the [Proxmox forum](#).

Access Proxmox Server Remotely - Virtual Console not Loading

So you have Nginx Proxy Manager setup to remotely access your Proxmox server. Everything is working fine *except* your virtual console? This is a common issue and I have an easy fix!

Step 1: Edit the Proxy Host



Turn on the switch for "Websockets Support" then save it.

Step 2: Done.

As always, PLEASE exercise caution when exposing this over the internet. At the very least, [enable Proxmox TFA](#) and add another layer of security to your Proxmox host.

Check out my [Youtube channel](#) for self hosting related content!

Setup and Install Docker in a Proxmox LXC Container

This guide is for Proxmox VE 6.4.4 or earlier and will NOT work well on version 7. See [this guide](#) for 7.

[You should check out my website at noted.lol!](#)

Containers are a lightweight alternative to fully virtualized machines (VMs). They use the kernel of the host system that they run on, instead of emulating a full operating system (OS). This means that containers can access resources on the host system directly.

The runtime costs for containers is low, usually negligible. However, there are some drawbacks that need be considered:

- Only Linux distributions can be run in Proxmox Containers. It is not possible to run other operating systems like, for example, FreeBSD or Microsoft Windows inside a container.
- For security reasons, access to host resources needs to be restricted. Therefore, containers run in their own separate namespaces. Additionally some syscalls (user space requests to the Linux kernel) are not allowed within containers.

Proxmox VE uses [Linux Containers \(LXC\)](#) as its underlying container technology. The “Proxmox Container Toolkit” (`pct`) simplifies the usage and management of LXC, by providing an interface that abstracts complex tasks.

Containers are tightly integrated with Proxmox VE. This means that they are aware of the cluster setup, and they can use the same network and storage resources as virtual machines. You can also use the Proxmox VE firewall, or manage containers using the HA framework.

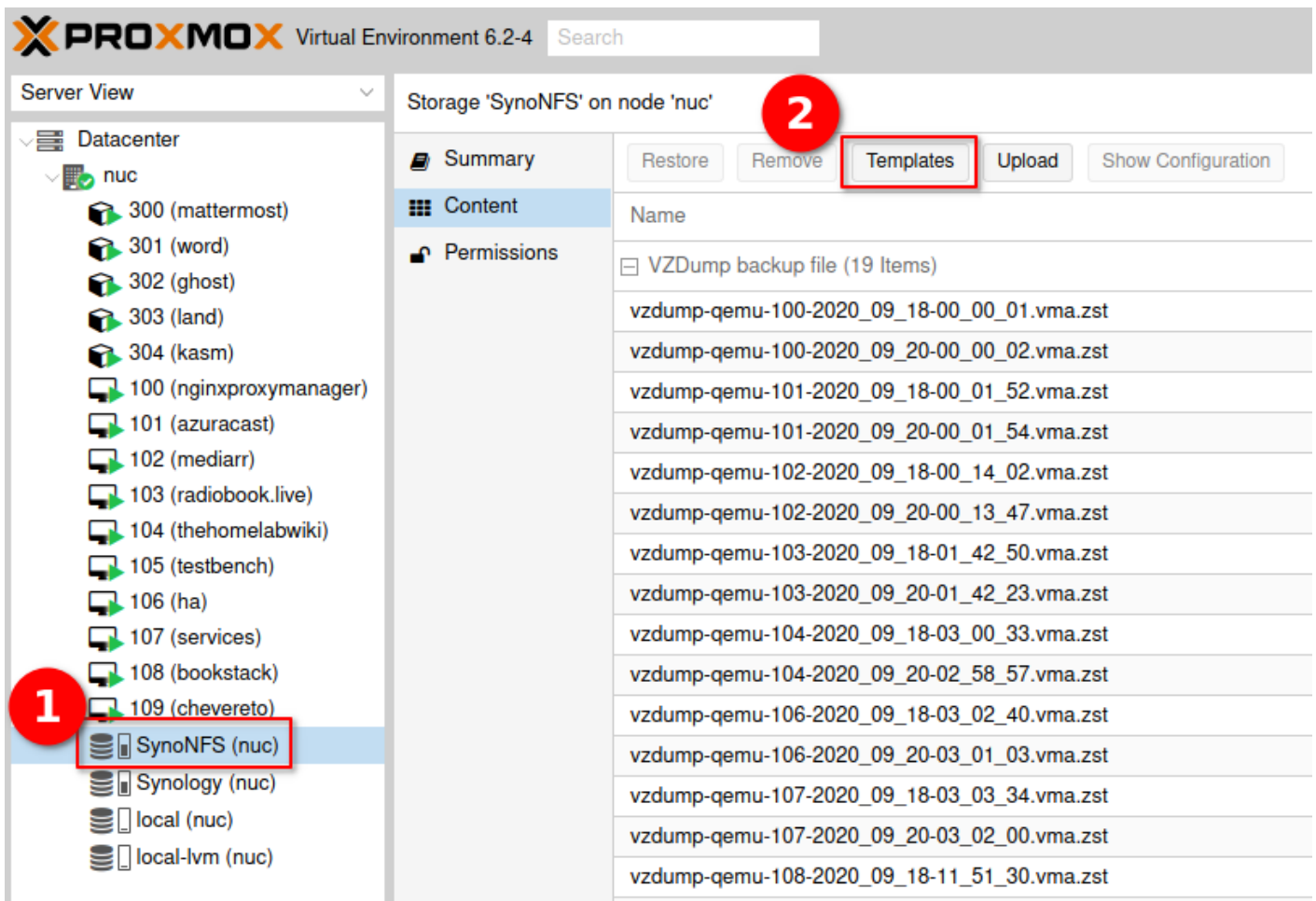
Our primary goal is to offer an environment that provides the benefits of using a VM, but without the additional overhead. This means that Proxmox Containers can be categorized as “System Containers”, rather than “Application Containers”.

The above was cited from the Proxmox VE website.

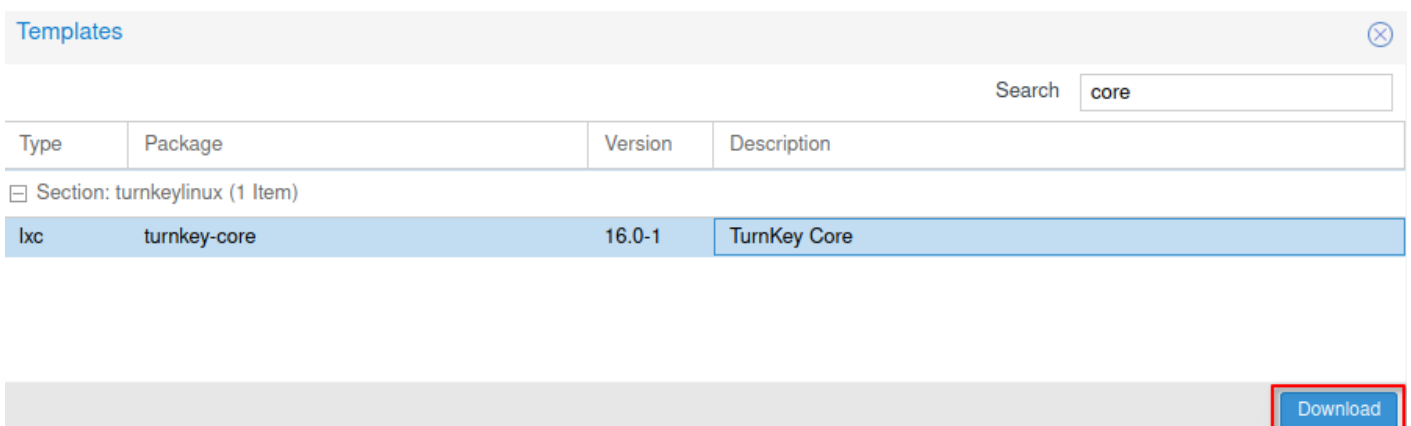
Download the Turnkey Core template

To setup and install Docker in a Proxmox LXC Container, you will have to download the Turnkey Core template to your storage.

1. Click on your storage then click on the templates button.

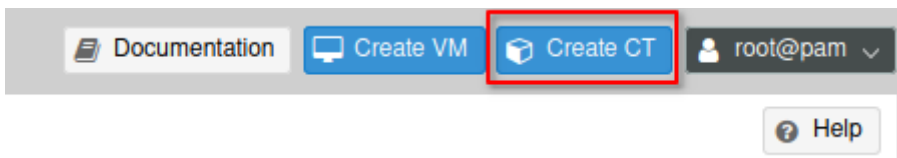


2. Search for the core template and click download.



Type	Package	Version	Description
Section: turnkeylinux (1 Item)			
lxc	turnkey-core	16.0-1	TurnKey Core

3. When it's done you can click the "Create CT" button in the upper right corner.



4. Set your hostname and password and be sure to UNCHECK "Unprivileged container" or this will not work. Now move on to the Template tab.

The screenshot shows the 'Create: LXC Container' form in the 'General' tab. The form has several input fields: 'Node' (set to 'nuc'), 'CT ID' (set to '110'), 'Hostname' (set to 'docker'), 'Resource Pool' (empty), 'Password' (masked with dots), 'Confirm password' (masked with dots), and 'SSH public key' (empty). There is a checkbox labeled 'Unprivileged container' which is unchecked and highlighted with a red rectangular box. A 'Load SSH Key File' button is located below the 'SSH public key' field. The form has tabs for 'General', 'Template', 'Root Disk', 'CPU', 'Memory', 'Network', 'DNS', and 'Confirm'. A 'Help' button is in the top right corner.The screenshot shows the bottom navigation bar of the form. It includes a 'Help' button with a question mark icon, an 'Advanced' checkbox which is checked, and 'Back' and 'Next' buttons.

5. Select the storage where you downloaded the Turnkey Core template then choose the template.

The screenshot shows the 'Create: LXC Container' form in the 'Template' tab. The form has two input fields: 'Storage' (set to 'SynoNFS') and 'Template' (set to 'debian-10-turnkey-core_16.0-1_i'). Both fields are highlighted with a blue rectangular box. The form has tabs for 'General', 'Template', 'Root Disk', 'CPU', 'Memory', 'Network', 'DNS', and 'Confirm'. A 'Help' button is in the top right corner.

6. In the Storage tab choose where you want the container to use storage. For the disk size I recommend at-least 20gb of space. This depends on what you plan on doing with the container. For example if you plan on downloading a bunch of files, you may want a larger size disk.

Create: LXC Container ⓧ

General Template **Root Disk** CPU Memory Network DNS Confirm

Storage: SynoNFS

Disk size (GiB): 20

Enable quota: ☐ ACLs: Default

Mount options: Skip replication: ☐

7. On the CPU tab, I usually put 4 cores but this is overkill for a container. This depends on the processor you have in your system.

Create: LXC Container ⓧ

General Template Root Disk **CPU** Memory Network DNS Confirm

Cores: 4

CPU limit: unlimited CPU units: 1024

8. On the Memory tab I usually allocate 2gb for containers.

Create: LXC Container ⓧ

General Template Root Disk CPU **Memory** Network DNS Confirm

Memory (MiB): 1908

Swap (MiB): 1000

9. On the Network tab I let the DHCP host assign the IP automatically.

Create: LXC Container

GeneralTemplateRoot DiskCPUMemoryNetworkDNSConfirm

Name:eth0

MAC address:auto

Bridge:vmbr0

VLAN Tag:no VLAN

Rate limit (MB/s):unlimited

Firewall:☒

IPv4: ☐ Static ☒ DHCP

IPv4/CIDR:

Gateway (IPv4):

IPv6: ☐ Static ☒ DHCP ☐ SLAAC

IPv6/CIDR:

Gateway (IPv6):

10. On the DNS tab I just use my gateway IP.

Create: LXC Container

GeneralTemplateRoot DiskCPUMemoryNetworkDNSConfirm

DNS domain:192.168.1.1

DNS servers:192.168.1.1

11. Confirm your settings and make sure you DO NOT tick "Start after created". Click finish and let the container create.

Create: LXC Container



General

Template

Root Disk

CPU

Memory

Network

DNS

Confirm

Key ↑	Value
cores	4
hostname	docker
memory	1908
nameserver	192.168.1.1
net0	bridge=vmbbr0,name=eth0,ip=dhcp,ip6=dhcp,firewall=1
nodename	nuc
ostemplate	SynoNFS:vztmpl/debian-10-turnkey-core_16.0-1_amd64.tar.gz
pool	
rootfs	SynoNFS:20
searchdomain	192.168.1.1
swap	1000
vmid	110

☐ Start after created

Advanced ☒

Back

Finish

12. Once done, you will see "TASK OK". Click the X in the upper corner and proceed to the next step.

Task viewer: CT 110 - Create



Output

Status

Stop

```
Allocating group tables: 0/160 done
Writing inode tables: 0/160 done
Creating journal (32768 blocks): done
Multiple mount protection is enabled with update interval 5 seconds.
Writing superblocks and filesystem accounting information: 0/160 done

extracting archive '/mnt/pve/SynoNFS/template/cache/debian-10-turnkey-core_16.0-1_amd64.tar.gz'
Total bytes read: 506183680 (483MiB, 153MiB/s)
Detected container architecture: amd64
Creating SSH host key 'ssh_host_ed25519_key' - this may take some time ...
done: SHA256:oR+Ar4v7TNeonHo2Z6eOXVsFQL9bUSddx+271RfJqbl root@docker
Creating SSH host key 'ssh_host_dsa_key' - this may take some time ...
done: SHA256:6AmQfqBueqZrsQOhe/Nle5oULaD23bmDPO61Ds69jwc root@docker
Creating SSH host key 'ssh_host_ecdsa_key' - this may take some time ...
done: SHA256:AFZh2X+6b04ZKtieiz2bc///TsD8IY3isHyV7QQMxpY root@docker
Creating SSH host key 'ssh_host_rsa_key' - this may take some time ...
done: SHA256:oX9YalKvYHAWpAXAuunl87D9BnDgyOyus5WIGRm6TaM root@docker
TASK OK
```

13. Select the container and then click on Options then double click on Features.

PROXMOX Virtual Environment 6.2-4 Search

Server View

Datacenter

- nuc
 - 110 (docker)
 - 300 (mattermost)
 - 301 (word)
 - 302 (ghost)
 - 303 (land)
 - 304 (kasm)
 - 100 (nginxproxymanager)
 - 101 (azuracast)
 - 102 (mediarr)
 - 103 (radiobook.live)
 - 104 (thelabwiki)
 - 105 (testbench)

Container 110 (docker) on node 'nuc'

Summary Console Resources Network DNS Options Task History Backup Replication Snapshots

Edit Revert

Start at boot	No
Start/Shutdown order	order=any
OS Type	debian
Architecture	amd64
/dev/console	Enabled
TTY count	2
Console mode	tty
Protection	No
Unprivileged container	No
Features	none

14. Tick Nesting then click ok.

Edit: Features

keyctl: ☐ unprivileged only

Nesting: ☒

NFS: ☐

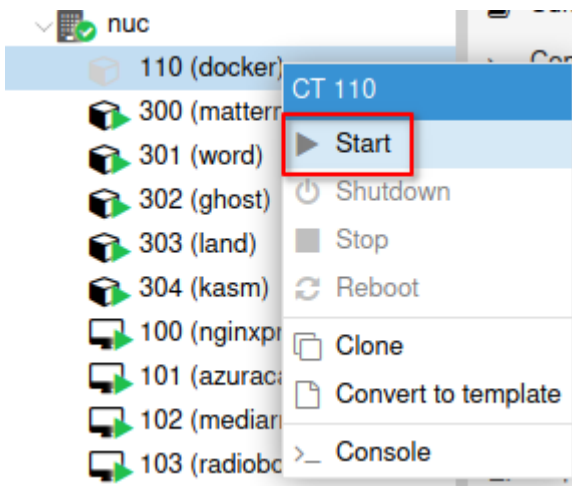
CIFS: ☐

FUSE: ☐

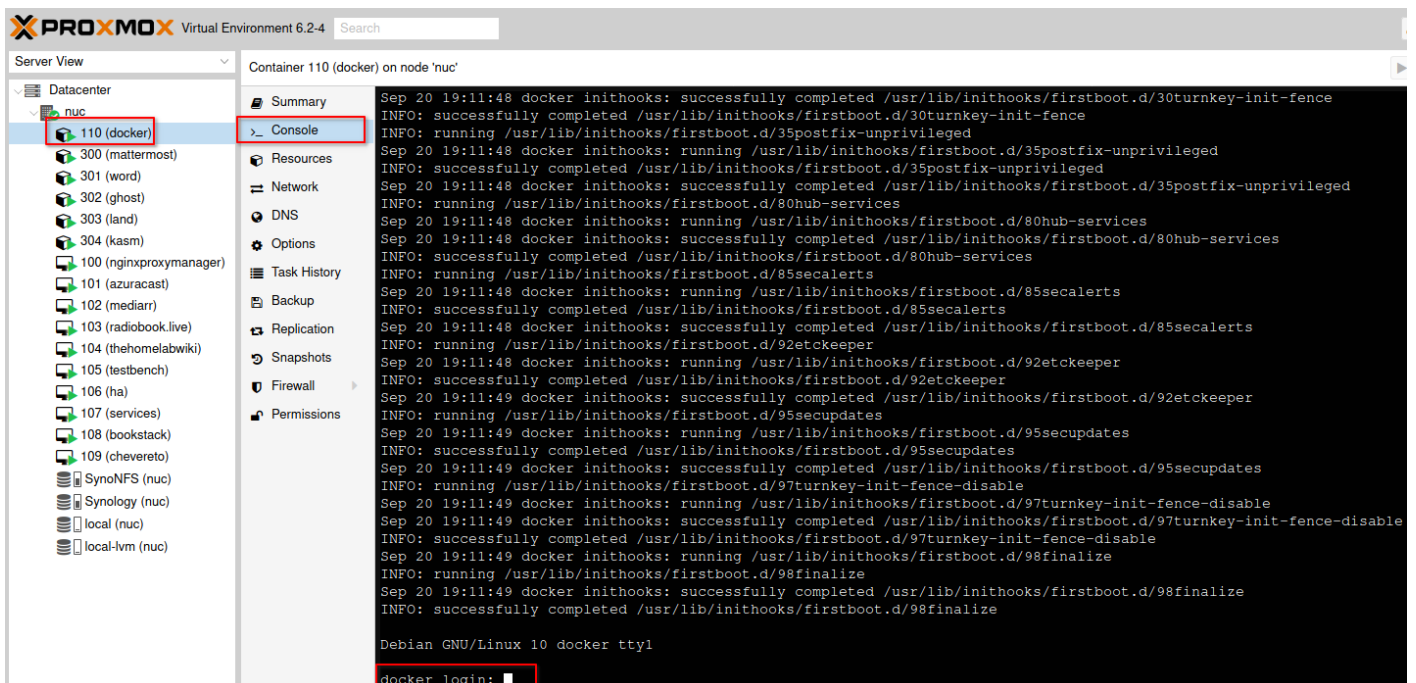
Create Device Nodes: ☐ Experimental

OK Reset

15. Now you can start your container and view the console.



This will start the container and run the install script then assign an IP to your container. Once done you will need to login using root and the password you chose when you created the container in step 4.



16. Now we have to go through the Turnkey setup. Skip the API entry.

Initialize Hub services

1) TurnKey Backup and Migration: saves changes to files, databases and package management to encrypted storage which servers can be automatically restored from.
<https://www.turnkeylinux.org/tklbam>

2) TurnKey Domain Management and Dynamic DNS:
<https://www.turnkeylinux.org/dns>

You can start using these services immediately if you initialize now. Or you can do this manually later (e.g., from the command line / Webmin)

API Key: (see <https://hub.turnkeylinux.org/profile>)

17. Skip the notifications.

System Notifications and Critical Security Alerts

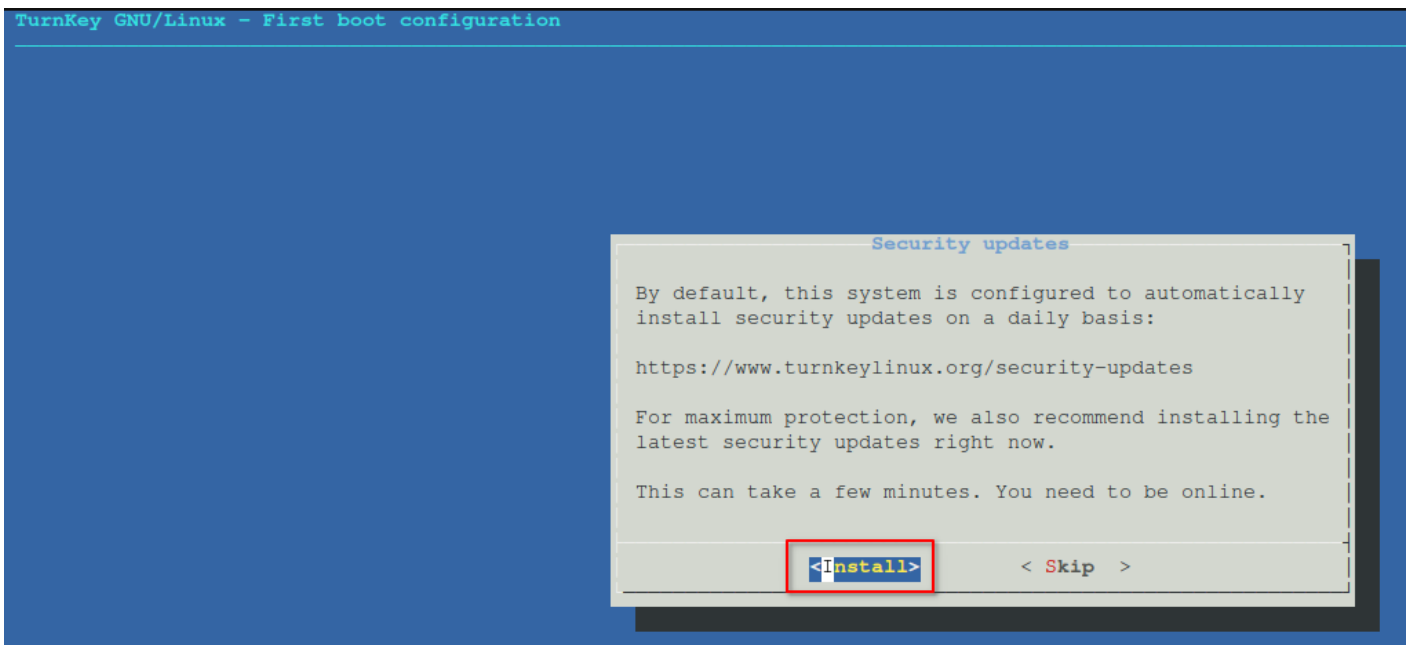
Enable local system notifications (root@localhost) to be forwarded to your regular inbox. Notifications include security updates and system messages.

You will also be subscribed to receive critical security and bug alerts through a low-traffic Security and News announcements newsletter. You can unsubscribe at any time.

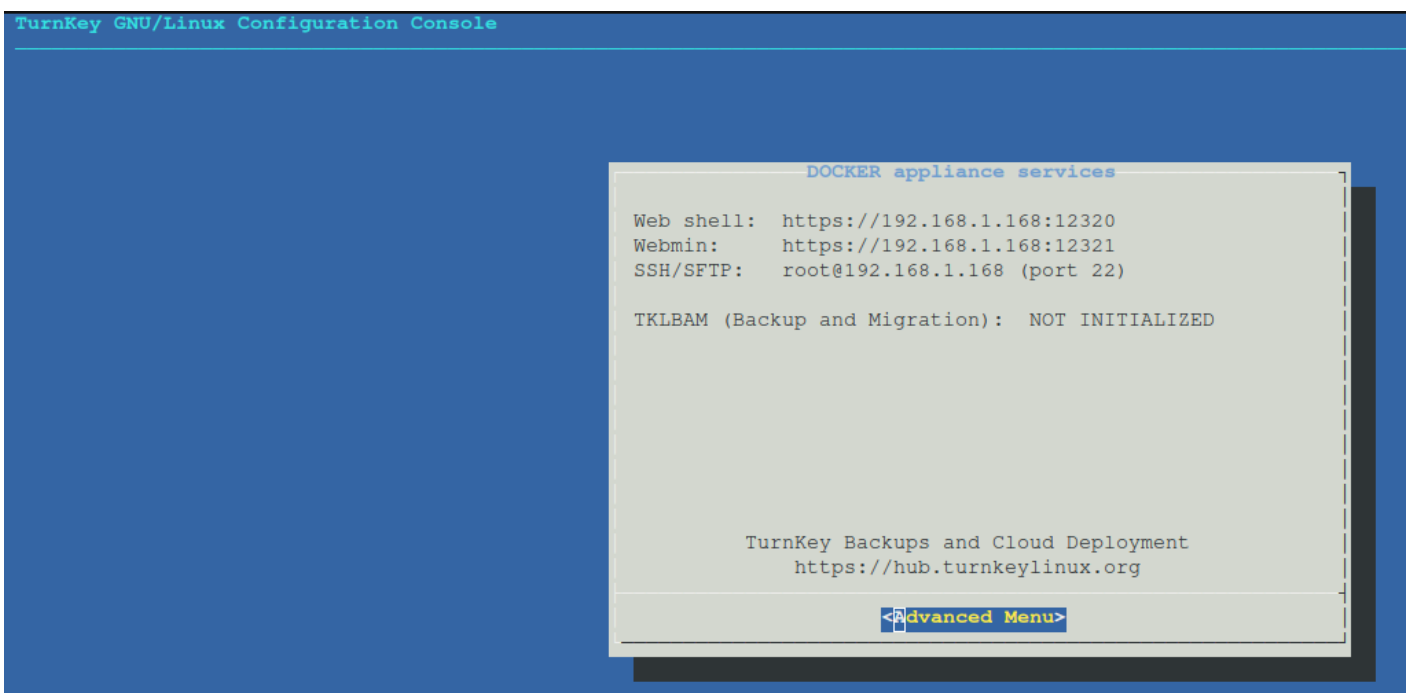
<https://www.turnkeylinux.org/security-alerts>

Email:

18. Install security updates.



This will take you to the final screen and will show you what the access IP and ports are for the appliance services. It's important to make a note of these incase you need them for future use.



19. Press CTRL+C to clear the console and now you can update the system by typing the commands below. Since we only use root in Proxmox, you do not need to use sudo for any commands through the console.

```
apt-get update
```

then

```
apt-get upgrade
```

Install Docker on your Promox Container

Run the following commands one at a time.

```
apt install docker.io
```

```
systemctl enable docker
```

```
systemctl start docker
```

Now make sure Docker is running

```
systemctl status docker
```

Install Portainer

This is completely optional but I wanted to add this in here just in-case you wanted a Docker UI. Run the following command to install Portainer 2.0

```
docker run -d \  
--name="portainer" \  
--restart on-failure \  
-p 9000:9000 \  
-v /var/run/docker.sock:/var/run/docker.sock \  
-v portainer_data:/data \  
portainer/portainer-ce
```

Once completed, visit the IP of your container and port 9000. Example: 192.168.1.168:9000.

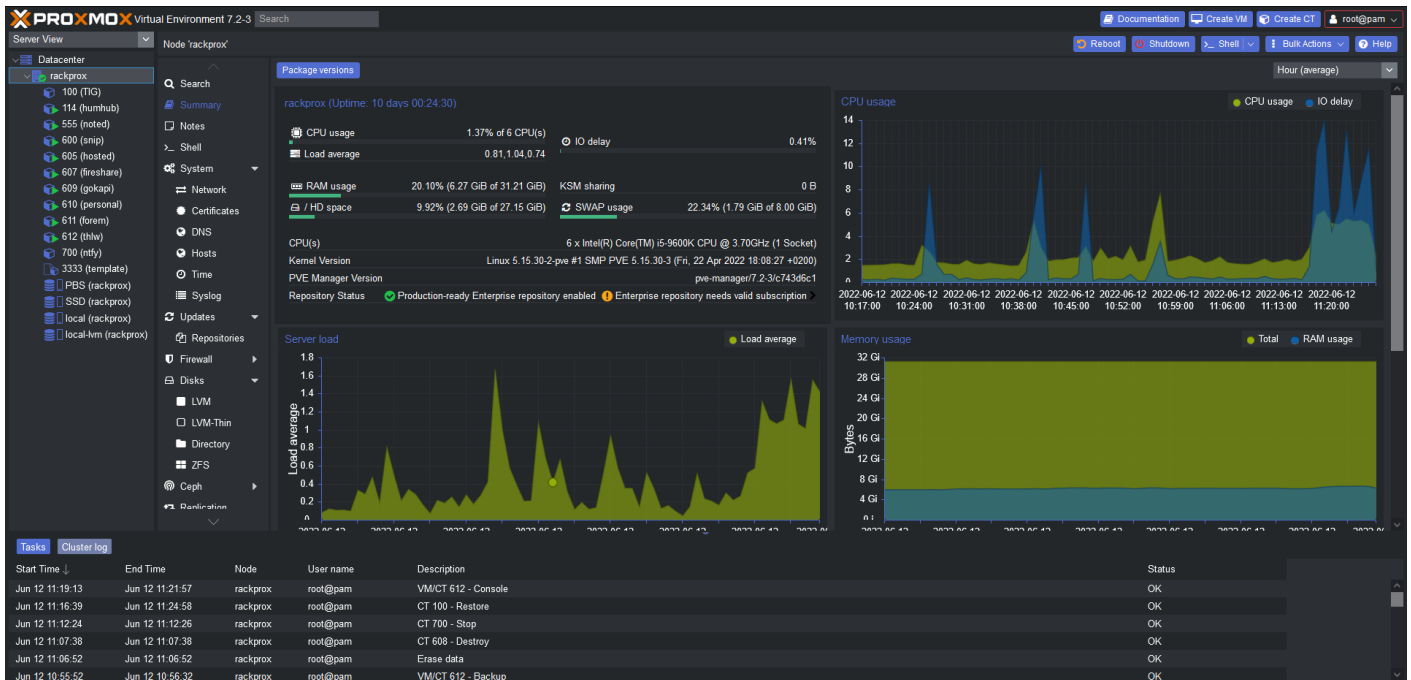
If you forgot the IP of your container, open the console and type

```
ip addr
```

Press enter and find your container IP. It's usually towards the top.

Did you find this helpful? [Subscribe to me on Youtube](#) for more content!

Setup and Install Docker in a Proxmox 7 LXC Container



[You should check out my website at noted.lol!](#)

Follow these steps to install docker in Proxmox 7 LXC.

Install Docker via Script (recommended)

This script is the [official Docker installer](#) maintained by Docker Inc.

```
curl -fsSL https://get.docker.com -o get-docker.sh
sh get-docker.sh
```

Install Docker Manually

Update the `apt` package index and install packages to allow `apt` to use a repository over HTTPS:

```
apt-get update
```

```
apt-get install \
  apt-transport-https \
  ca-certificates \
  curl \
  gnupg \
  lsb-release
```

Add Docker's official GPG key:

```
curl -fsSL https://download.docker.com/linux/debian/gpg | gpg --dearmor -o
/usr/share/keyrings/docker-archive-keyring.gpg
```

Use the following command to set up the **stable** repository. To add the **nightly** or **test** repository, add the word `nightly` or `test` (or both) after the word `stable` in the commands below. [Learn about **nightly** and **test** channels.](#)

```
echo \
  "deb [ arch=amd64 signed-by=/usr/share/keyrings/docker-archive-keyring.gpg]
https://download.docker.com/linux/debian \
  $(lsb_release -cs) stable" | tee /etc/apt/sources.list.d/docker.list > /dev/null
```

Update the `apt` package index, and install the *latest version* of Docker Engine and containerd.

```
apt-get update
```

```
apt-get install docker-ce docker-ce-cli containerd.io
```

Verify docker is running on the system

```
systemctl status docker
```

Add External USB Storage to Proxmox

To use storage from an attached USB drive, we need to enter the Proxmox shell command line interface. There's just a few quick things we need to do, then you can enjoy your new external storage on Proxmox!

Connect the USB Drive

Make sure the USB drive is connected and ready to go. It's best that the drive is new and not used with files already on it. Also, once you plug it in to a USB port, you cannot change the port after we mount it. This is very important. So make sure you have it plugged into the right USB port.

If you need to clear the drive you can do so using cfdisk.

```
cfdisk /dev/sdb
```

Make sure you change the drive accordingly to your own ID above. See below for how to find this information.

Figure out what drive it is

Find the drive device ID running this command

```
fdisk -l
```

Image not found or type unknown



Here we can see my 4TB USB drive. I had to scroll up pretty far in the terminal to find it. Here you can see the ID is sdb1.

Create the filesystem

If we tried mounting the drive without setting the filesystem, we would get an error like this

wrong fs type, bad option, bad superblock on /dev/sdb1, missing codepage or helper program, or other error.

So to avoid this, we need to run the following command

```
mkfs. ext4 /dev/sdb1
```

Make sure you change this to the correct device ID that matched your own drive.

Create folder for mounting

Now we have to make a folder where the drive will be mounted. I used the following folder.

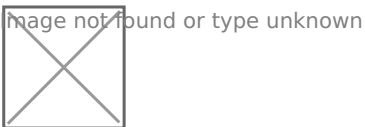
```
mkdir /mnt/USB_Data
```

Now we mount the drive to it

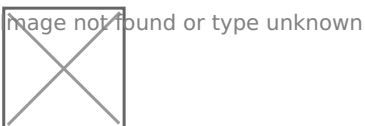
```
mount /dev/sdb1 /mnt/USB_Data
```

Add the drive in Proxmox UI

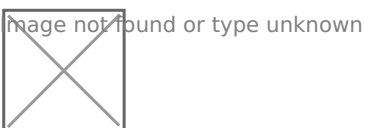
Now we go into Proxmox and add storage as a Directory using our new USB drive



Give it a name (any name should work). The Directory **MUST** be the folder where the new drive was mounted. Click add.



You should now see your new drive and it should be ready to use.



You most likely want the USB drive to automatically mount when you reboot or unplug and plug them back in. To accomplish this we need to run the following in the PVE shell.


```
apt-key adv --recv-keys --keyserver keyserver.ubuntu.com 2FAB19E7CCB7F415
echo "deb https://apt.iteas.at/iteas buster main" > /etc/apt/sources.list.d/iteas.list
apt update
apt install pve6-usb-automount
```

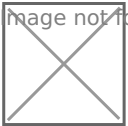
Did you find this helpful? [Subscribe to me on Youtube](#) for more content!

Enable Proxmox TFA Two Factor Authentication

There just *might* be a time when you want to do more with your Proxmox host and expose it to the internet so you can access it remotely. Or so you just don't have to remember the IP. Either way, adding another layer of security is a must. Especially if it's already baked into Proxmox. Why not use it? Enable TFA on Proxmox!

Step 1:

In the upper right corner click on "root@pam".



Step 2:

Click "TFA"



Step 3:

Click on "Randomize" a few times then open your favorite Authentication app. I use an app called [Authy](#). It's free and works great! You should be able to use any authentication app. Scan the QR code to add your Proxmox host to your authenticator app.



Step 4:

Grab the code and plug it in on Proxmox where it says "Verification code"

Step 5:

Click "Apply".

Check out my [Youtube channel](#) for self hosting related content!

How to list VMs and Containers in Proxmox

To get the list of virtual machines and containers you have on your proxmox node, run the following commands.

To list containers run this command in shell

```
pct list
```

To list VMs, run this command in shell

```
qm list
```