Creating an LXC Container

This document describes how to create and configure a standard LXC container.

The following documents will only describe the installation and configuration of applications within a functional LXC container.

Goal

Create an LXC container with the following specifications:

- **CTID:** 110
- **Hostname:** apache110
- **IP:** 192.168.137.110/24
- **Gateway:** 192.168.137.1
- **DNS:** inherited from the host
- **RAM:** 512 MB
- **Hard Drive:** 8 GB
- **Template:** `/var/lib/vz/template/cache/ubuntu-24.04-standard_24.04-2_amd64.tar.zst`

Additional Steps

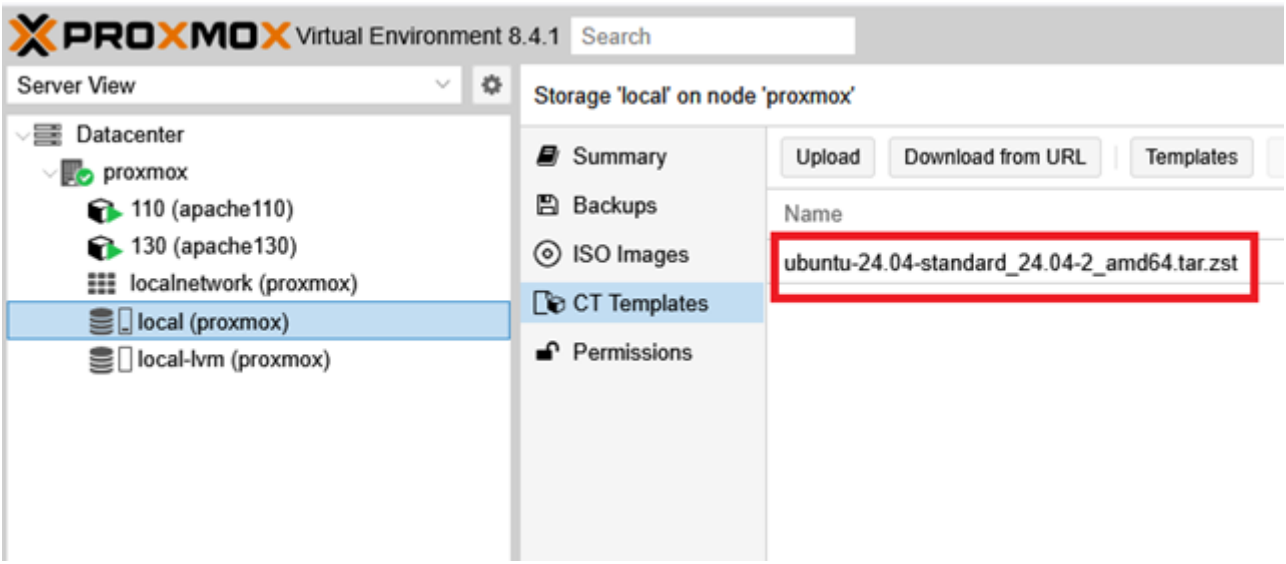
1. Create a user `pdal` (sudoer) with the password: `myPassword`.
2. Perform a system update (`apt update/upgrade`).
3. Set the `timedatectl` timezone to `Europe/Berlin` or yout timezone.
4. Check network connectivity (Gateway & DNS resolution).

> Note: For the PDAL project, you can exceptionally use the same user and password every time. This should, of course, never be done in production systems.

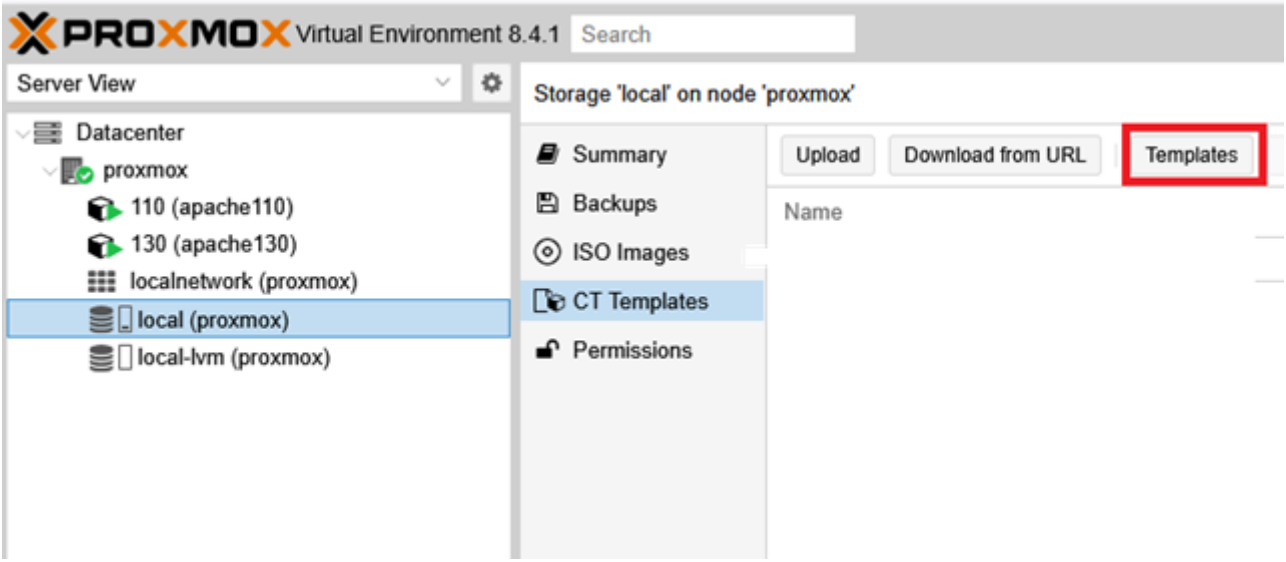
---

1. Check and Upload the Template

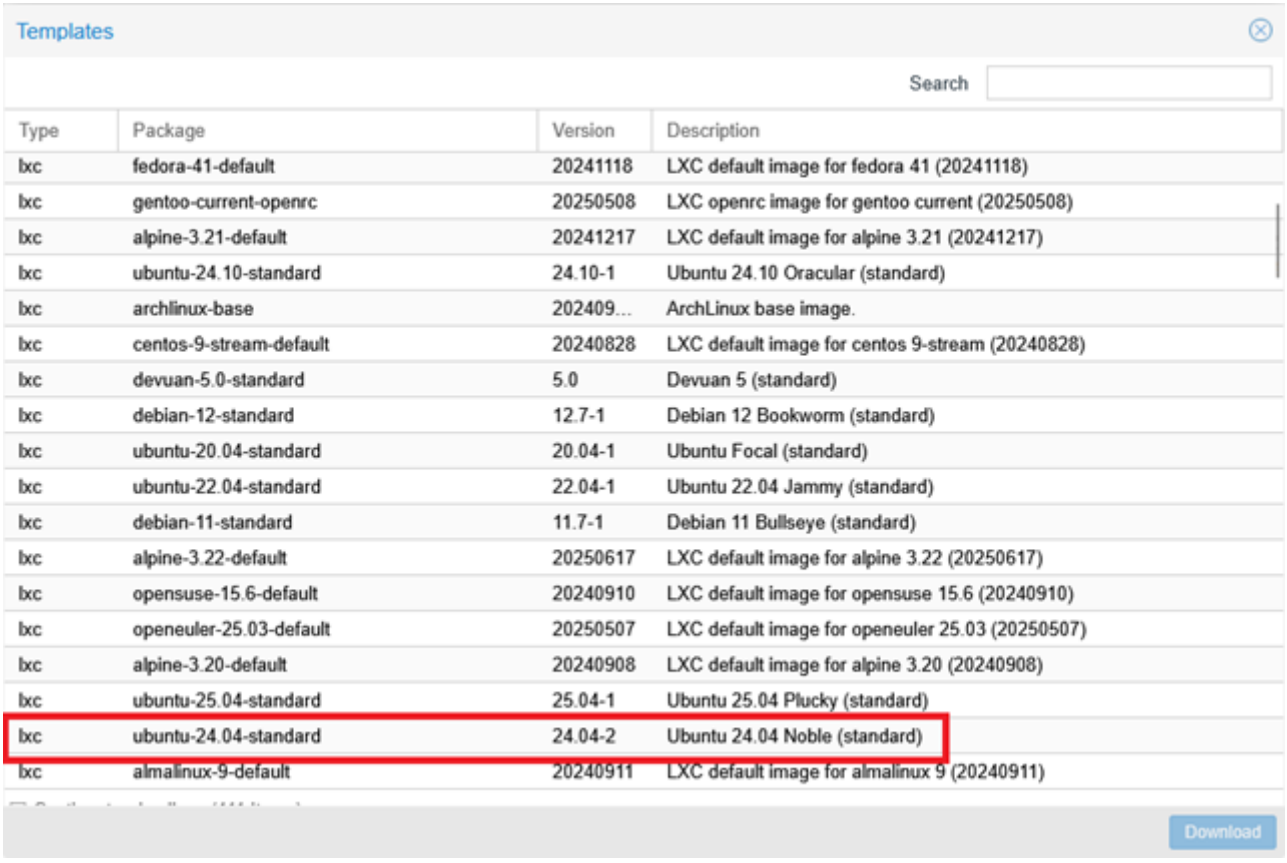
- Check under `Datacenter → <local> → Templates` to see if your template is available.



- If not: **Upload** or download via the web UI.



- Navigate to "Templates":



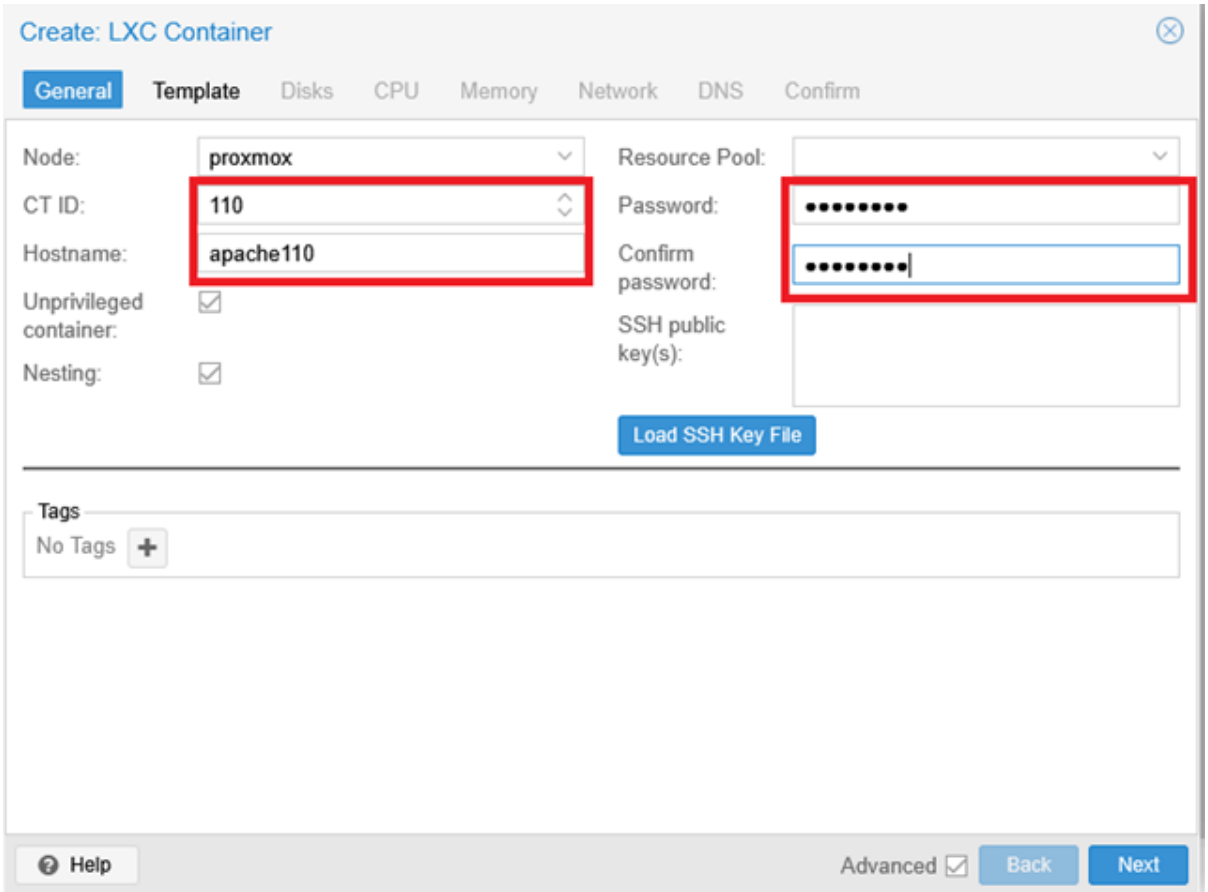
- Select the corresponding template and click "Download".

lxc	ubuntu-22.04-standard	22.04-1	Ubuntu 22.04 Jammy (standard)
lxc	debian-11-standard	11.7-1	Debian 11 Bullseye (standard)
lxc	alpine-3.22-default	20250617	LXC default image for alpine 3.22 (20250617
lxc	opensuse-15.6-default	20240910	LXC default image for opensuse 15.6 (20240
lxc	openeuler-25.03-default	20250507	LXC default image for openeuler 25.03 (2025
lxc	alpine-3.20-default	20240908	LXC default image for alpine 3.20 (20240908
lxc	ubuntu-25.04-standard	25.04-1	Ubuntu 25.04 Plucky (standard)
lxc	ubuntu-24.04-standard	24.04-2	Ubuntu 24.04 Noble (standard)
lxc	almalinux-9-default	20240911	LXC default image for almalinux 9 (20240911

After the download, the template should now be displayed.

🛠 2. Create the Container

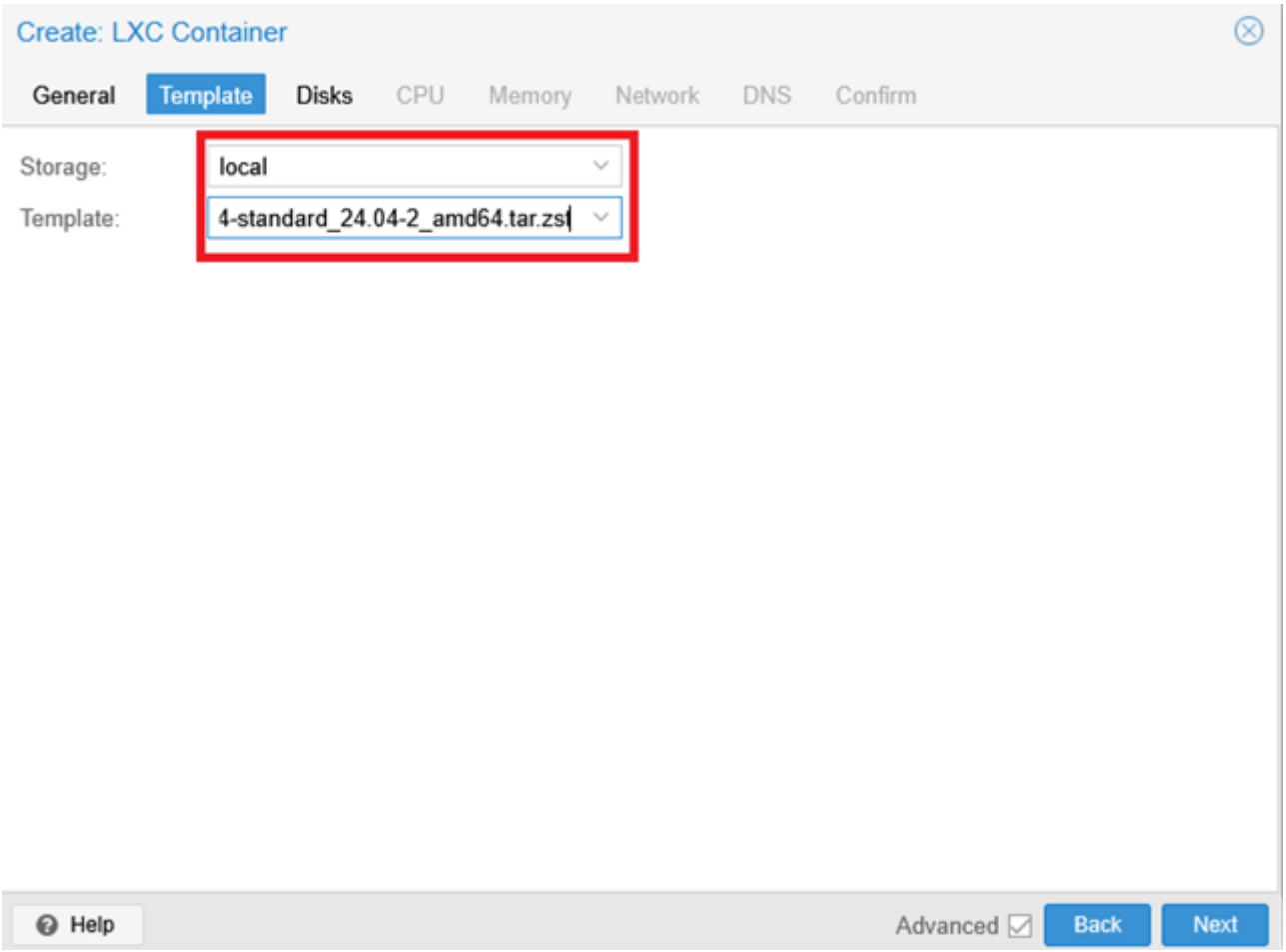
1. Right-click on the node → **Create CT**
2. **General**:
   - CT ID: `110`
   - Hostname: `apache110`
   - Password: (set root password)
   - Unprivileged: ☑



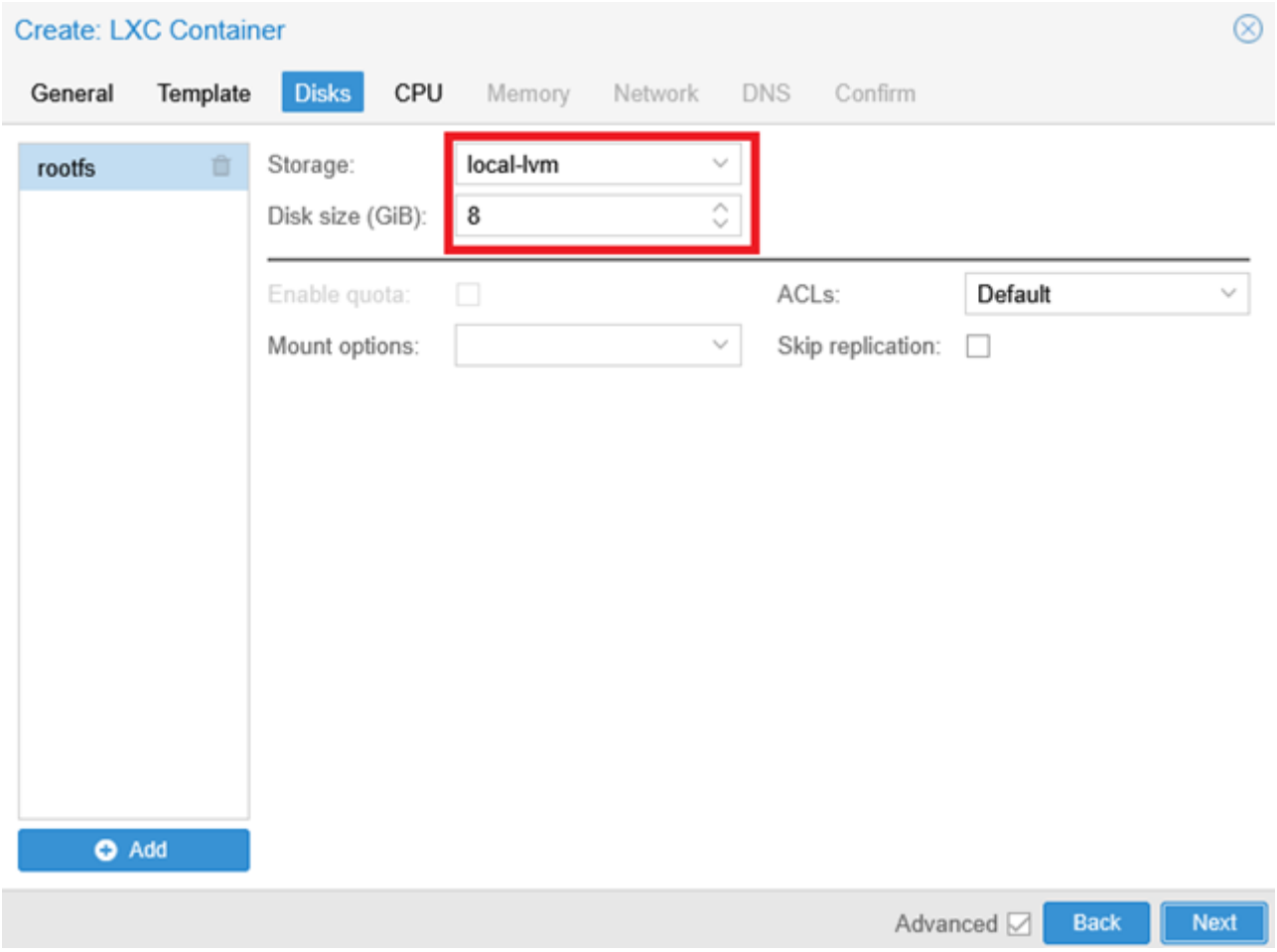
> Note: Proxmox uses three-digit numbers for the CT ID. We will use the last octet of the IP address as an identifier. You should also choose a descriptive name, for example, "apache110."

3. **Template**:

- Storage: e.g., `local`
- Select template

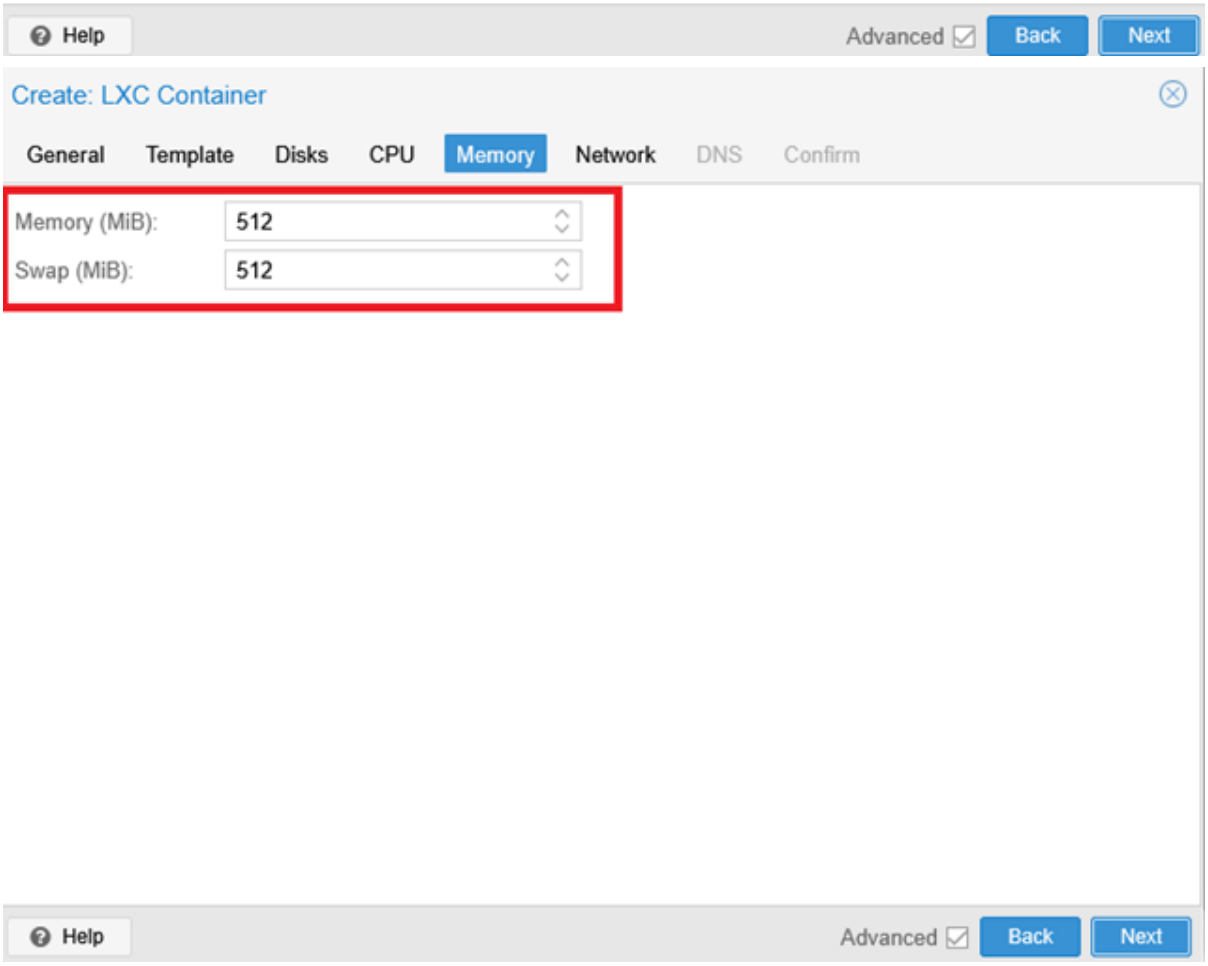


4. **Root Disk**:
   - Storage: `local-lvm`
   - Size: `8 GiB`



5. **CPU & Memory**:
    - Cores: 1

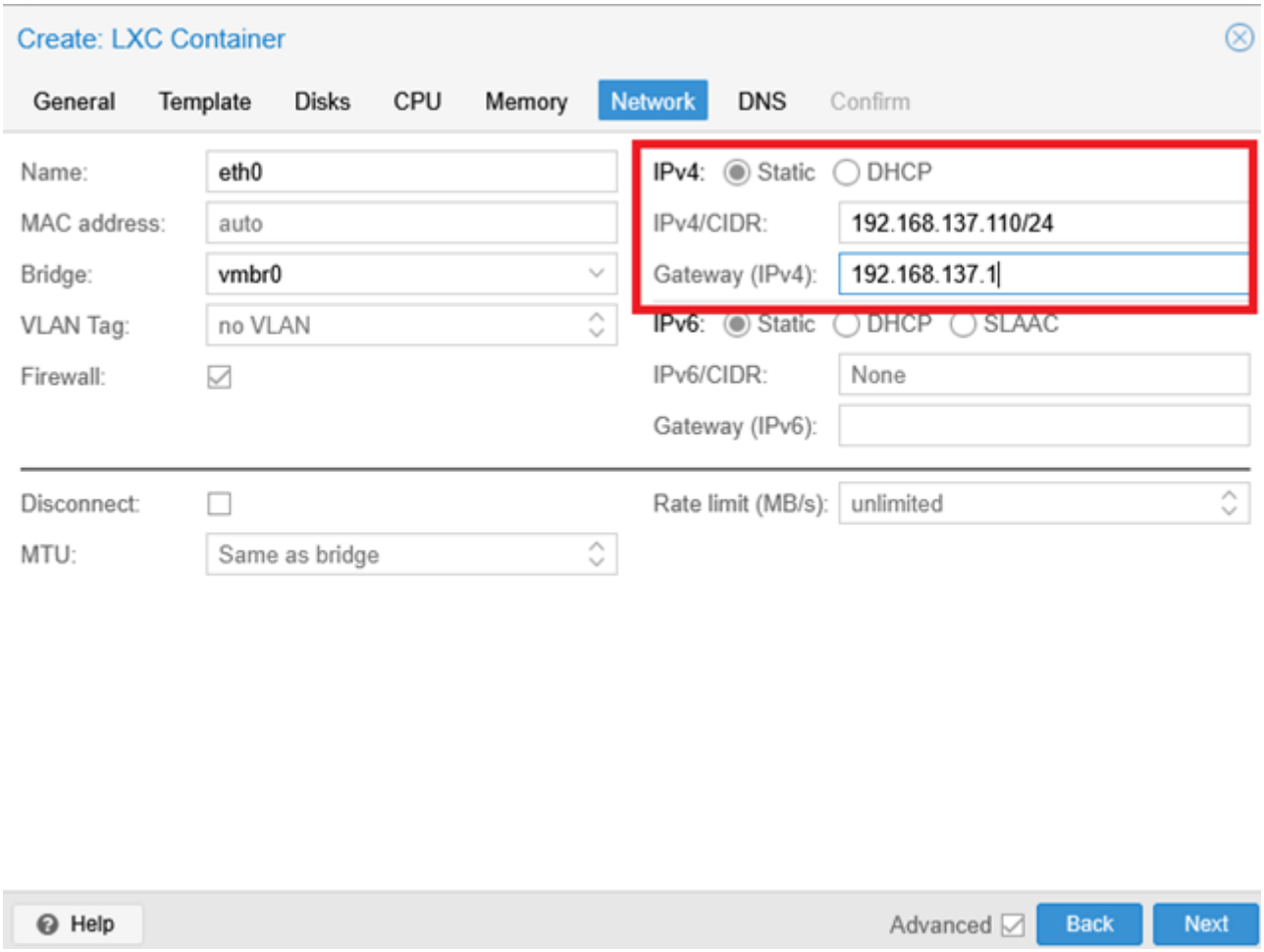
- Memory: `512 MiB`, Swap optional `512 MiB`



6. **Network**:

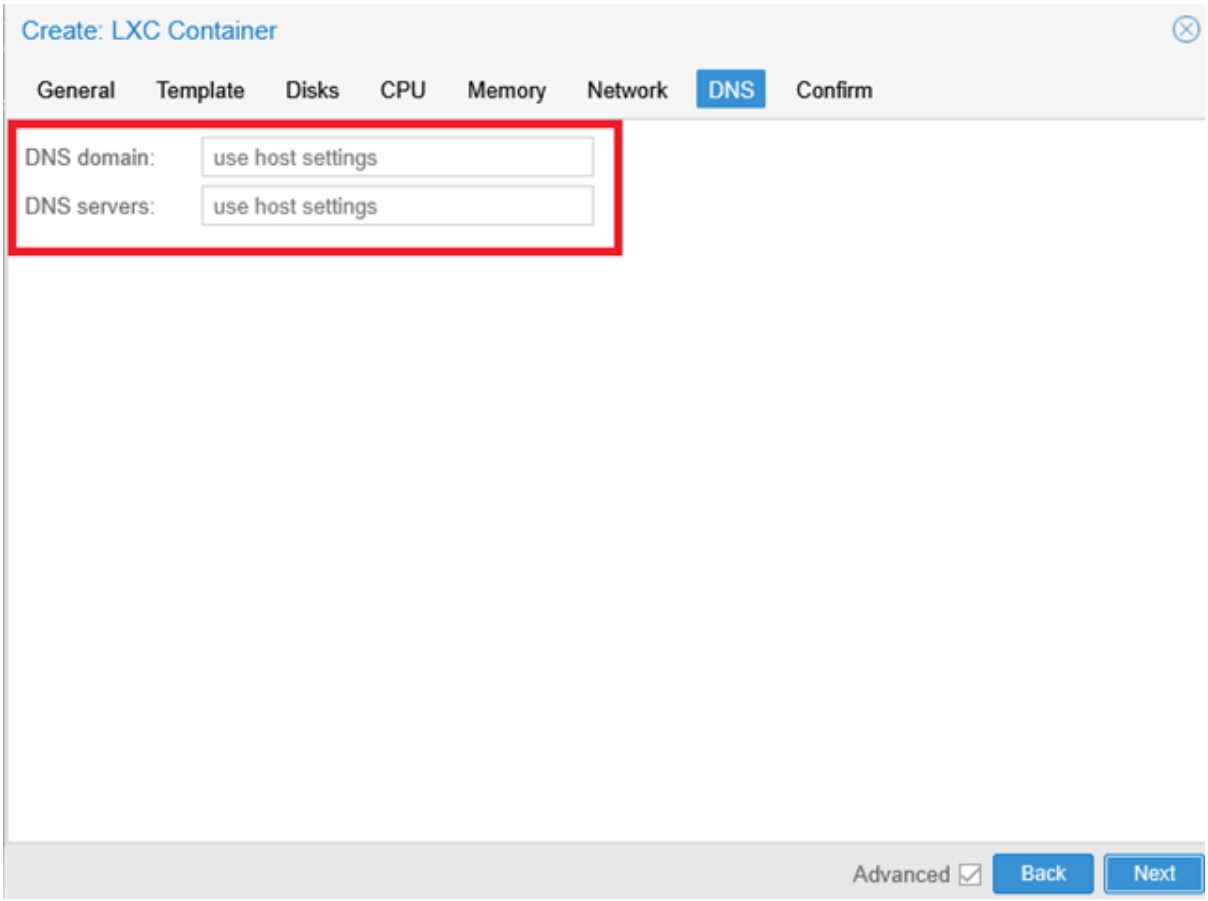
- Bridge: `vmbr0`
- IPv4: Static `192.168.137.110/24`

- Gateway: `192.168.137.1`



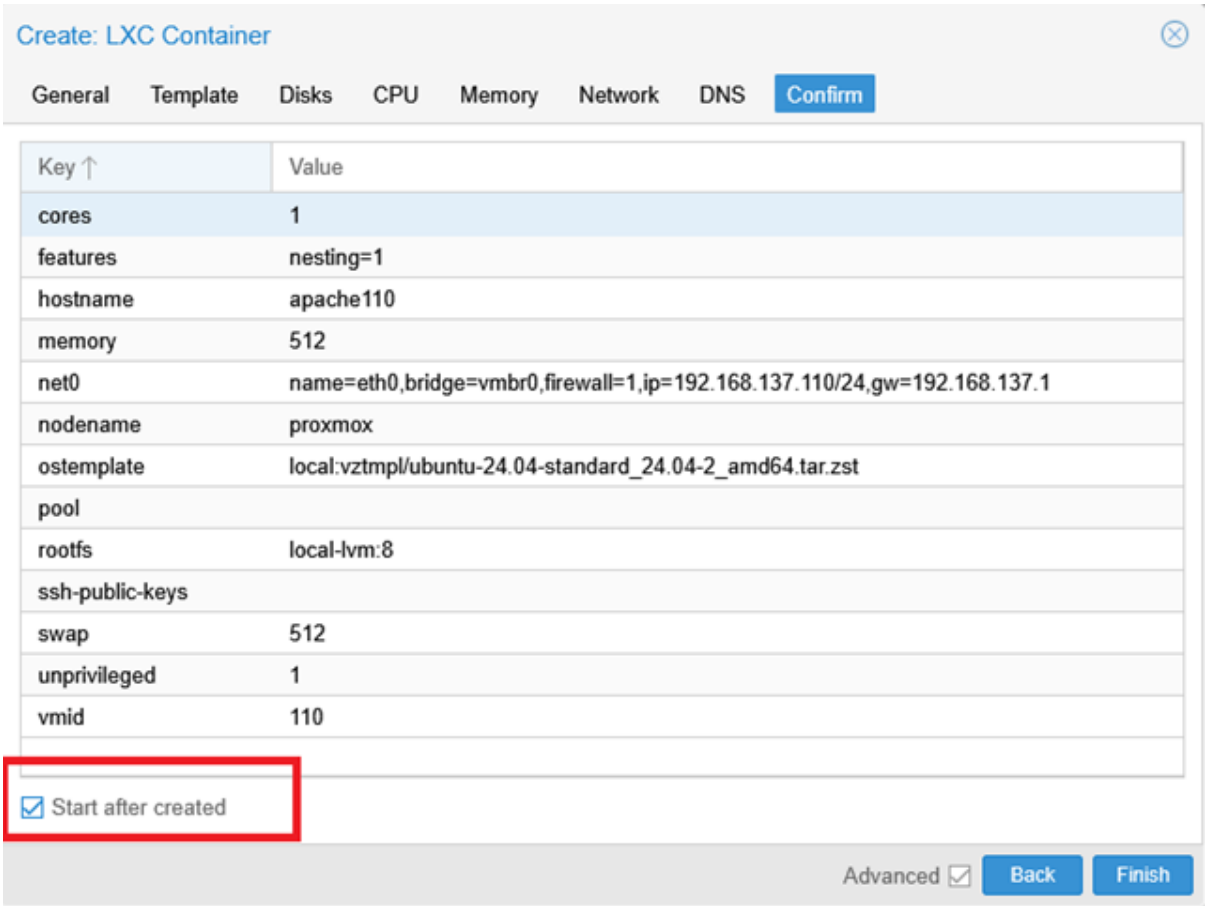
7. **DNS**:

- "Use DNS from host" (Default)



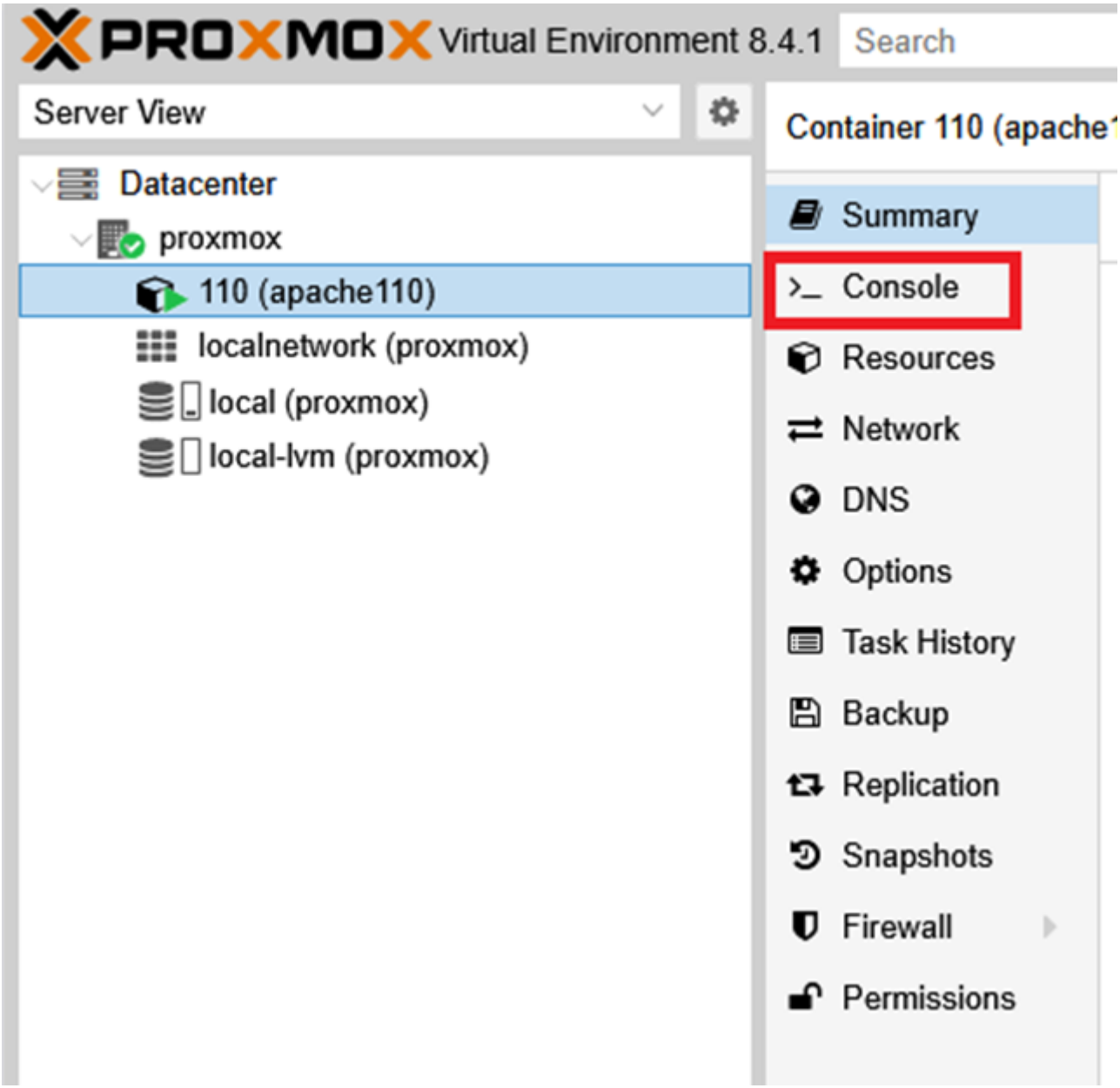
8. **Confirm**:

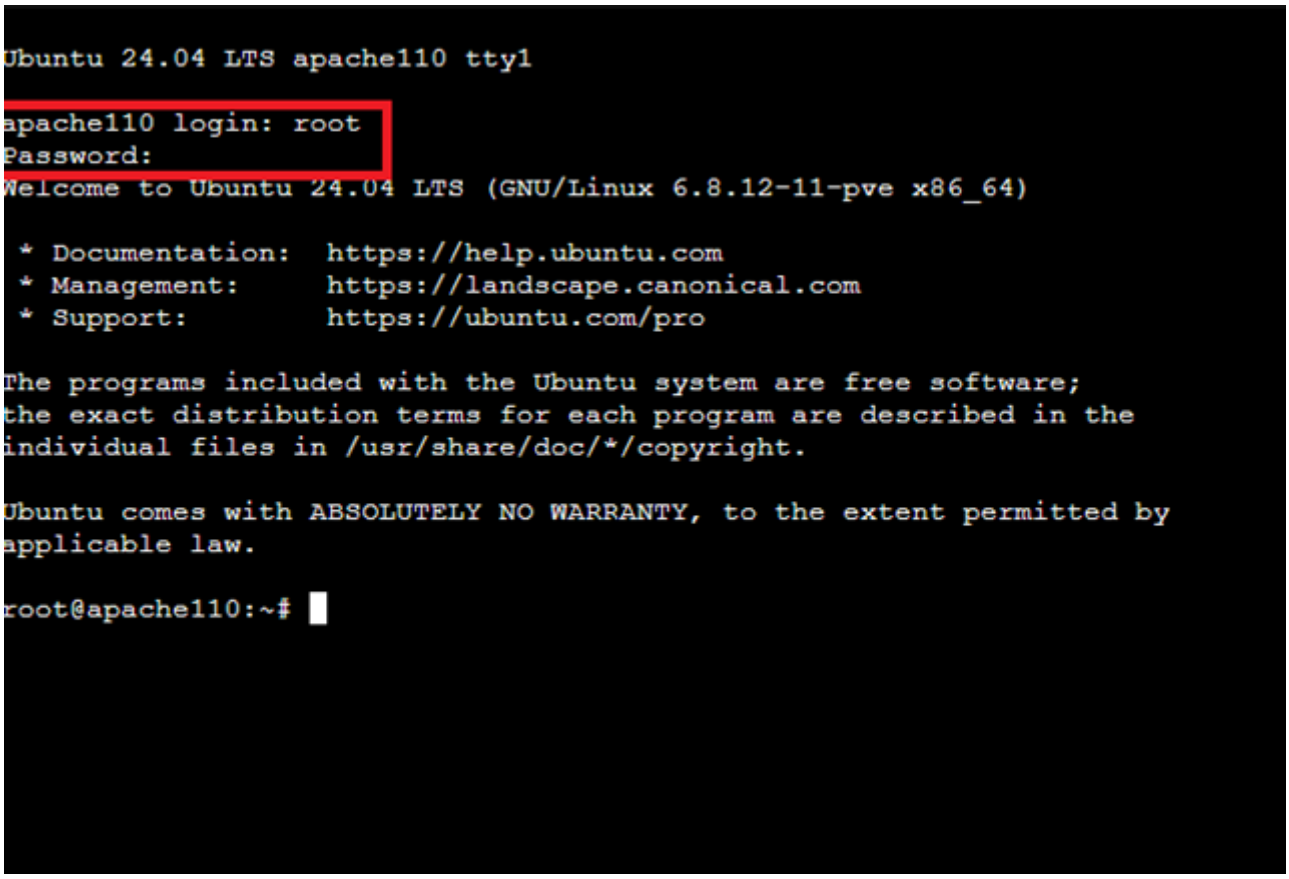
- "Start after created": ☑
- Click **Finish**



▶ 3. Start Container & First Steps

- The container will start automatically or can be started manually via the web UI.
- Open the Console → log in with `root` + the password you set.

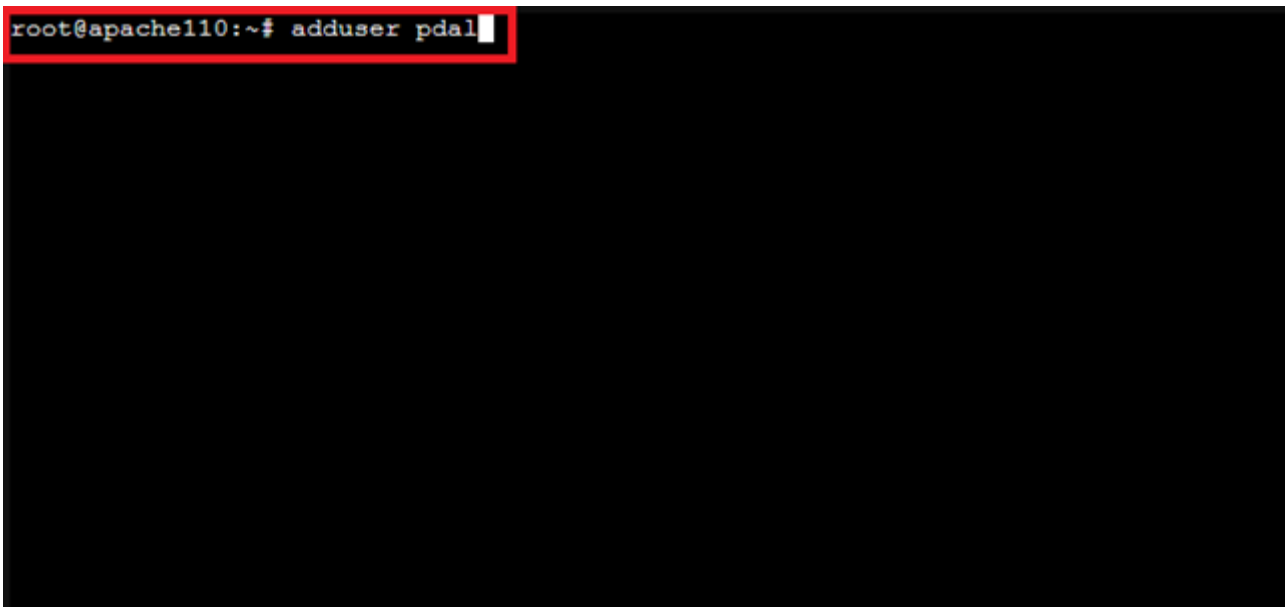




---

4. Create User `pdal` & Set as Sudoer

```
adduser pdal
# Password: meinPasswort
usermod -aG sudo pdal
```

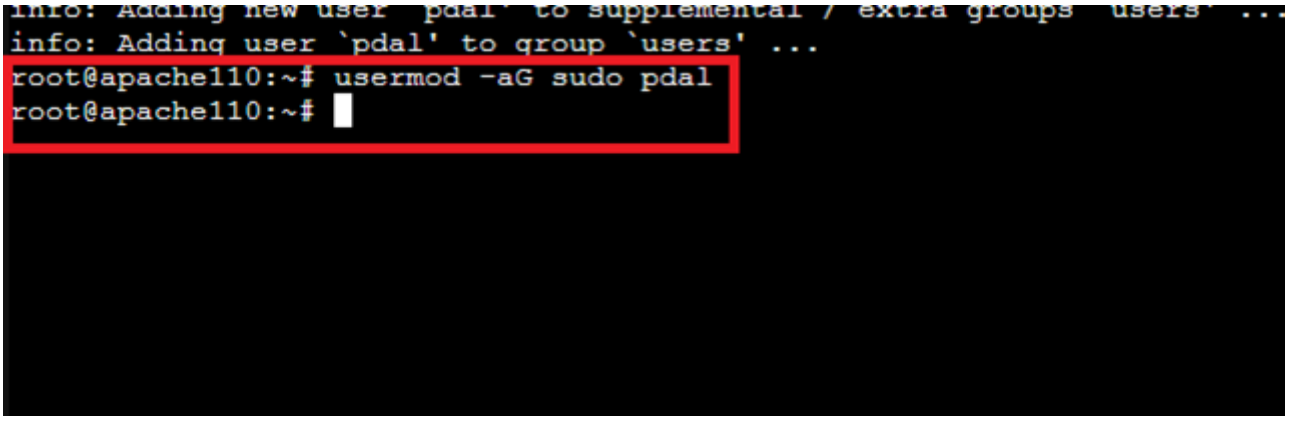


```
root@apache110:~# adduser pdal
info: Adding user `pdal' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `pdal' (1000) ...
info: Adding new user `pdal' (1000) with group `pdal (1000)' ...
info: Creating home directory `/home/pdal' ...
info: Copying files from `/etc/skel' ...
New password:
```

Set and confirm the password for user `pdal`.

```
root@apache110:~# adduser pdal
info: Adding user `pdal' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `pdal' (1000) ...
info: Adding new user `pdal' (1000) with group `pdal (1000)' ...
info: Creating home directory `/home/pdal' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
```

```
root@apache110:~# adduser pdal
info: Adding user `pdal' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `pdal' (1000) ...
info: Adding new user `pdal' (1000) with group `pdal (1000)' ...
info: Creating home directory `/home/pdal' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for pdal
Enter the new value, or press ENTER for the default
        Full Name []:
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n]
```

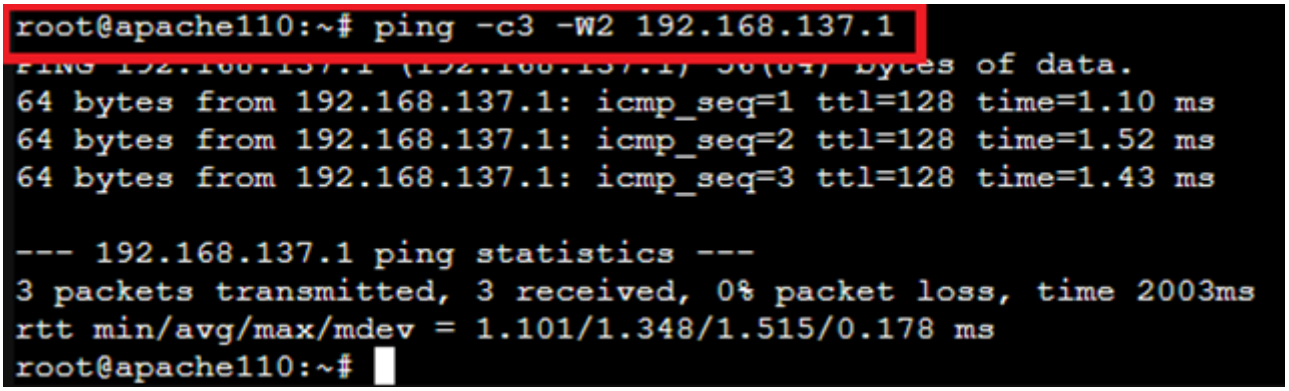


5. Network Check

In this step, we ensure that the new container has a network connection.

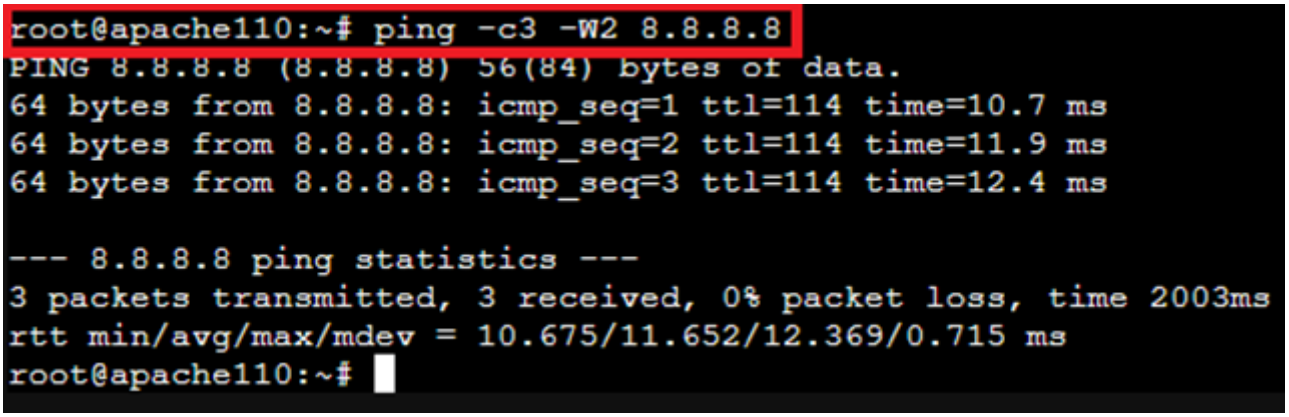
```
ping -c3 192.168.137.1
```

> Note: The `-c3` option executes only three pings.



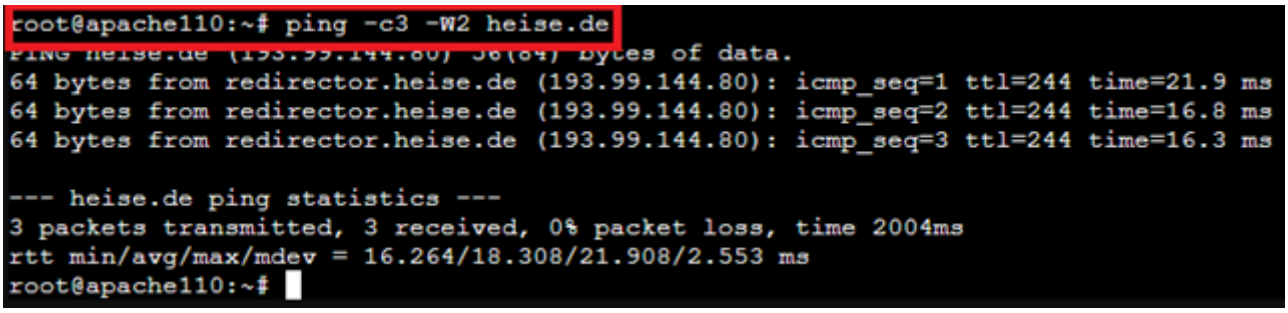
This step ensures that a network connection exists. If problems occur here, please check the container's network settings - `ContainerID → Network → Network Settings`.

```
ping -c3 8.8.8.8
```



This step ensures that external IP addresses can be reached.

```
ping -c3 heise.de
```

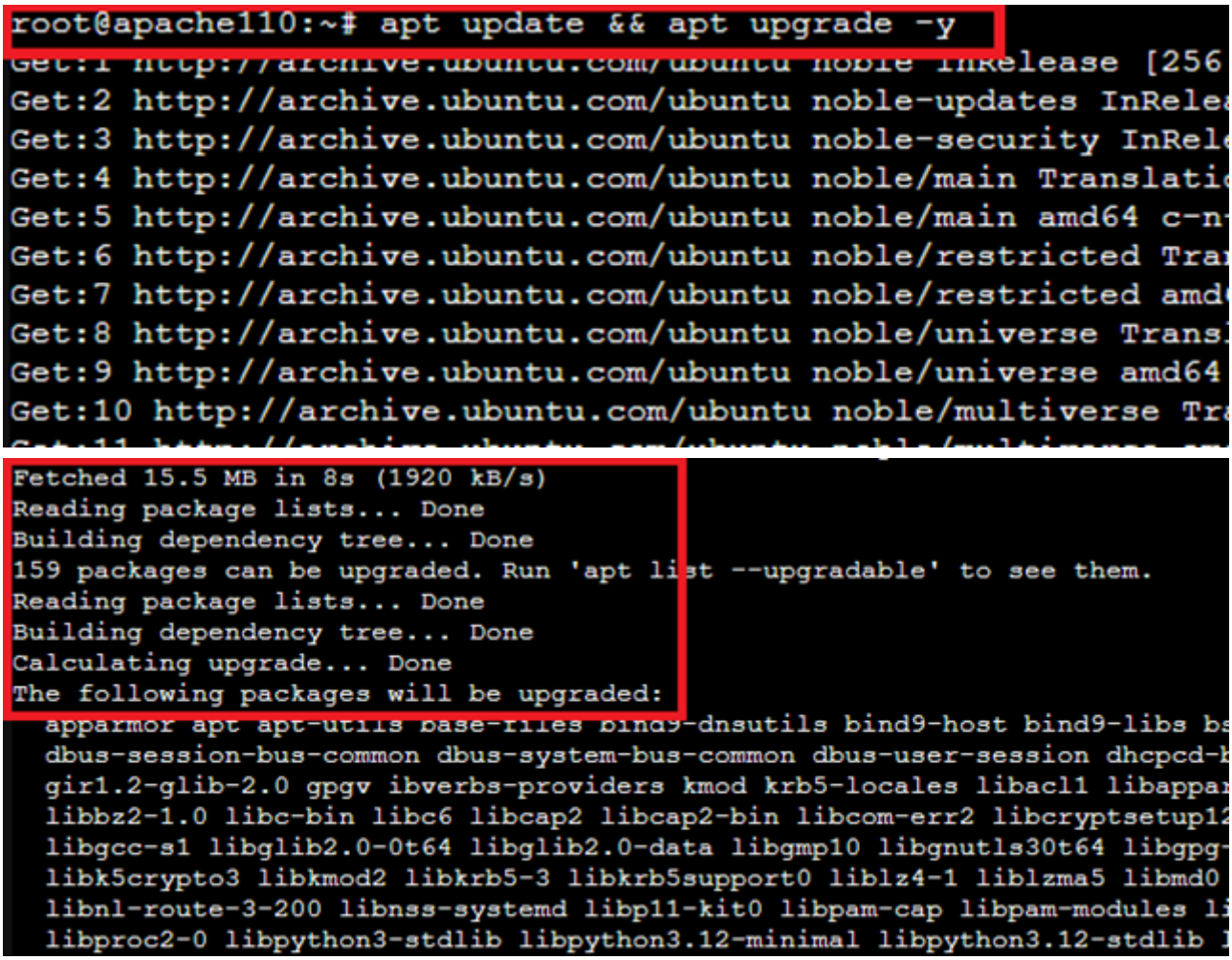


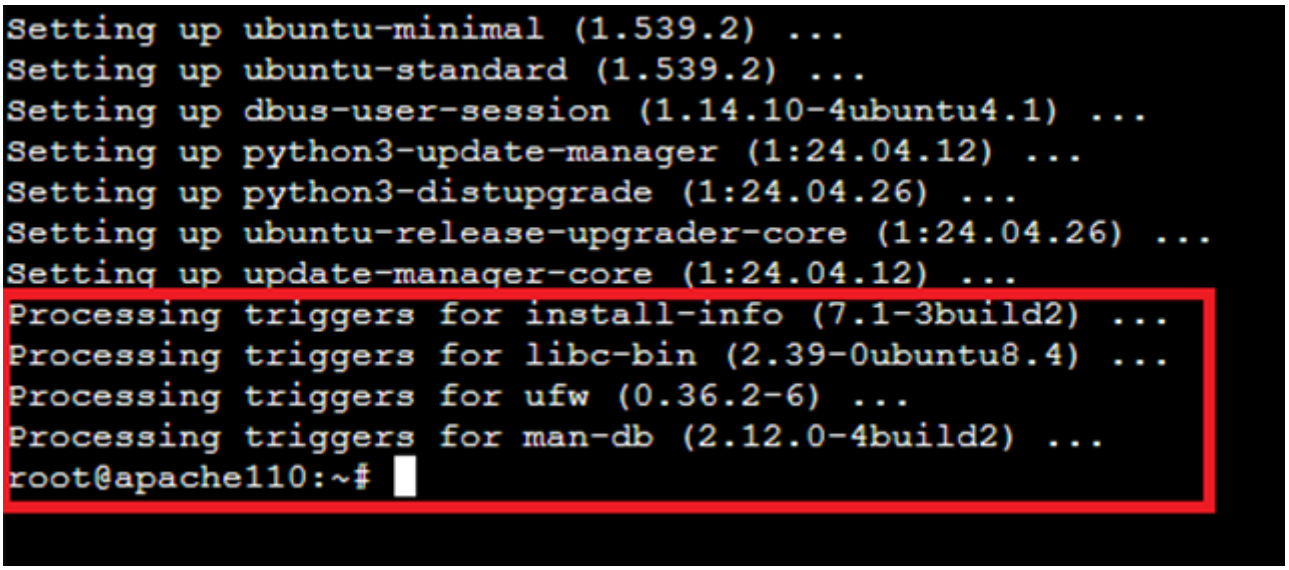
This step ensures that DNS resolution is working correctly.

6. Update the System

With a correctly functioning network, you can now update the system:

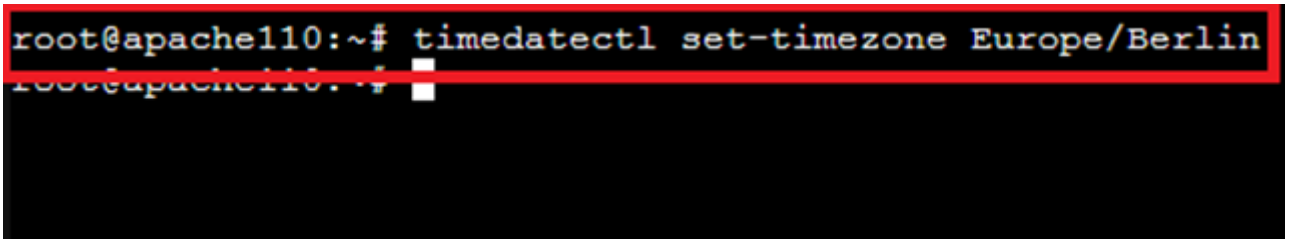
```
apt update && apt upgrade -y
```



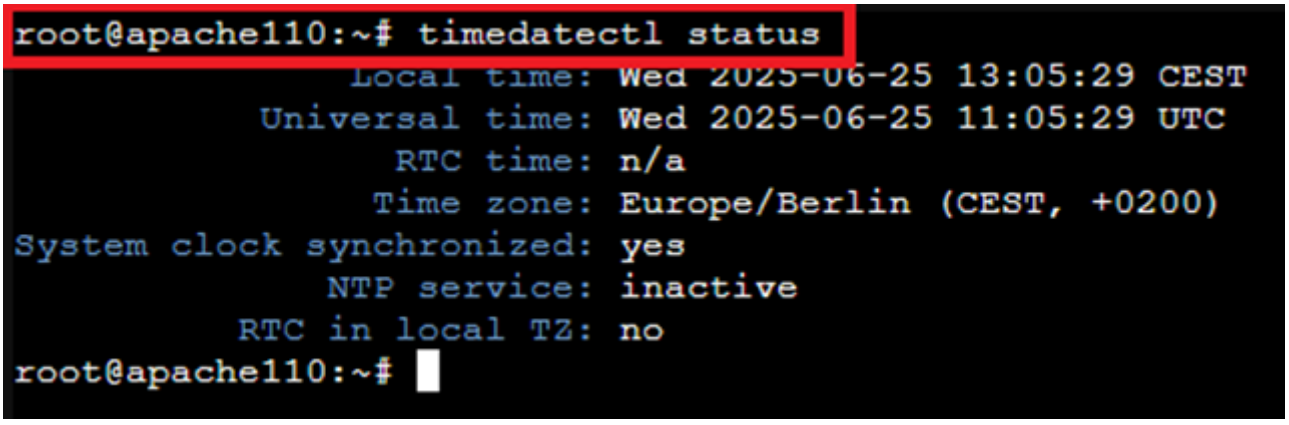


7. Configure Timezone for Display Only and Check Status

```
timedatectl set-timezone Europe/Berlin
```




```
timedatectl status
```



> Note: The container gets its system time from the host system (Proxmox). If the system time here is incorrect, check the settings in Proxmox.

☑ 🚀 Result

The `apache110` container is now:

- Configured with user pdal (sudo).

- Network checked (Gateway, DNS).
- Fully updated (apt update/upgrade).
- Timezone set to Europe/Berlin.

You can now use the container for your purposes and install or configure corresponding applications.

---

8. Setting the UTF-8 Character Set

Choosing the correct character set can often simplify your work. First, check which character set is currently set:

```
locale
```

If the output appears as:

```
LANG=C
LANGUAGE=
LC_CTYPE="C"
LC_NUMERIC="C"
LC_TIME="C"
LC_COLLATE="C"
LC_MONETARY="C"
LC_MESSAGES="C"
LC_PAPER="C"
LC_NAME="C"
LC_ADDRESS="C"
LC_TELEPHONE="C"
LC_MEASUREMENT="C"
LC_IDENTIFICATION="C"
LC_ALL=
```

the **ASCII character set** is active. This set does not support country-specific special characters—e.g., **ü, Ü, €, etc.**

Therefore, it makes sense to switch to a UTF-8 character set.

What is UTF-8?

UTF-8 (**U**nicode **T**ransformation **F**ormat - 8-bit) is the **globally dominant character encoding** today. Unlike older encodings (like ASCII or ISO-8859-1), UTF-8 can represent **all characters** and symbols from all languages (including umlauts, accents, Chinese, emojis) in a uniform format. Using UTF-8 ensures that text in log files, console output, and configuration files is displayed **correctly and consistently**.

National vs. Neutral UTF-8 Locales

UTF-8 character sets come in neutral and country-specific forms. These are defined in the **Locale** (the regional setting).

The Locale determines not only the encoding but also country-specific rules for:

- **Date and Time**
- **Currency and Number Format** (e.g., comma vs. period as decimal separator)
- **Sort Order** (`LC_COLLATE`)

For servers and containers used internationally or for scripts, the **neutral C.UTF-8 locale** is often the best standard.

Locale	Meaning	Application
`de_DE.UTF-8`	**National Locale** (German, Germany)	Aligns formats (numbers, sorting) with German rules. Good for desktop users.
`C.UTF-8`	**Neutral Locale** (C-Standard with UTF-8)	Uses standardized, binary sorting rules and a period as the decimal separator. **Optimal for servers and scripts** as it provides consistent and predictable output.

If you prefer a local setting, look up the correct designation in the list under `nano /etc/locale.gen` and replace `C.UTF-8` with the desired designation.

🛠️ Setting up the Neutral C.UTF-8 Locale

By default, the outdated `LANG=C` (ASCII) is often used in the container. To switch this to the modern standard `C.UTF-8`, follow these steps:

1. **Generate Locale (if necessary):** Ensure that the locale is available.

```
sudo locale-gen C.UTF-8
```

1. **Set Standard Locale Permanently:** Overwrite the old `C` settings with `C.UTF-8` in the system's configuration files.

```
sudo update-locale LANG=C.UTF-8 LC_ALL=C.UTF-8
```

3. **Activate Changes:** Log out of the shell and log back in, or restart the container.

```
exit # and log back in
```

4. **Verification:** Check the new settings.

```
locale
```

> **Result:** The output should now show `LANG=C.UTF-8` and `LC_ALL=C.UTF-8`.

Sources

- "Proxmox VE Documentation Index." Accessed: June 4, 2025. [Online]. Available at: Proxmox PVE-Docs
- canonical, "Ubuntu Server how-to guides." [Online]. Available at: Ubuntu Server How-To

---

License