

Flux Arcane Installation Guide

Welcome to the Official Flux Arcane Install Guide

Setup & monitor your Flux Nodes on both ZelCore and SSP

Wallets <https://zelcore.com> <https://sspwallet.com/>

In this Guide we will focus only on the ArcaneOS install.

To run one FluxNode at home you need your router to support DMZ or UPNP. You can run up to 8 nodes; If running more than one node - UPNP support on your router is mandatory.

The ArcaneOS is currently only for AMD64 (x86-64) processors, ARM devices should install the operating system

on the old mechanism using the previous guide.

[https://medium.com/@mmalik4/flux-light-node-setup-as-ea
sy-as-it-gets-833f17c73dbb](https://medium.com/@mmalik4/flux-light-node-setup-as-easy-as-it-gets-833f17c73dbb)

Installation Overview

To install the new Flux ArcaneOS we have to undertake the following:

- Run the installer via attached ISO or Usb Stick.
- Select system settings eg, keyboard layout, hostname, network, etc.
- Choose what disks we want to use for the installation.
- Load the Flux Signed Platform Key into our Mainboard firmware.
- Reboot into the newly installed system and run the secondary installer.

Download URL

<https://images.runonflux.io/latest>

You can download the image over ssh with commands:

```
curl -JO https://images.runonflux.io/latest
```

```
wget --content-disposition https://images.runonflux.io/latest
```

Pre Flight

If you are installing onto a Virtual Machine (VM) you only need to download the Flux Arcane OS ISO. However, if you are installing on a bare metal machine, you will need to create yourself a bootable usb stick of the image, this can be done with software like Balena Etcher (MacOS and Windows) or Rufus (Windows only) etc.

Minimum System Requirements

On top of the existing Flux Nodes system requirements for CPU, RAM and SSD, there are the following additional requirements:

- A Trusted Platform Module (TPM 2.0) must be present (not mandatory for VPS's).
- Unified Extensible Firmware Interface (UEFI) boot mode.

These features are required on the machine that is running the FluxNode, whether that is virtual or physical. For example, if you are running a FluxNode on bare metal, the actual Mainboard will need a TPM. If you are running on a VM, that VM will need to have a TPM present (it can be virtual).

For bare metal installs, almost all modern main boards have these features.

For now you can only install ArcaneOS on VPS's if they support secure boot. At the time of writing this guide we don't know any VPS provider with secure boot working properly.

If you run the image and something is missing, you will get a warning message on the welcome screen, and will not be able

to proceed.

Step By Step

This step by step was completed using the Proxmox Hypervisor, however any similar hypervisor should work. Procedure should be very similar on Windows Oracle Virtual Box. VMWare v16 did not work but we got community reports it works with v17.

Create your VM, with the specs required to run your FluxNode tier. Here are the settings we that are required for the Arcane OS:

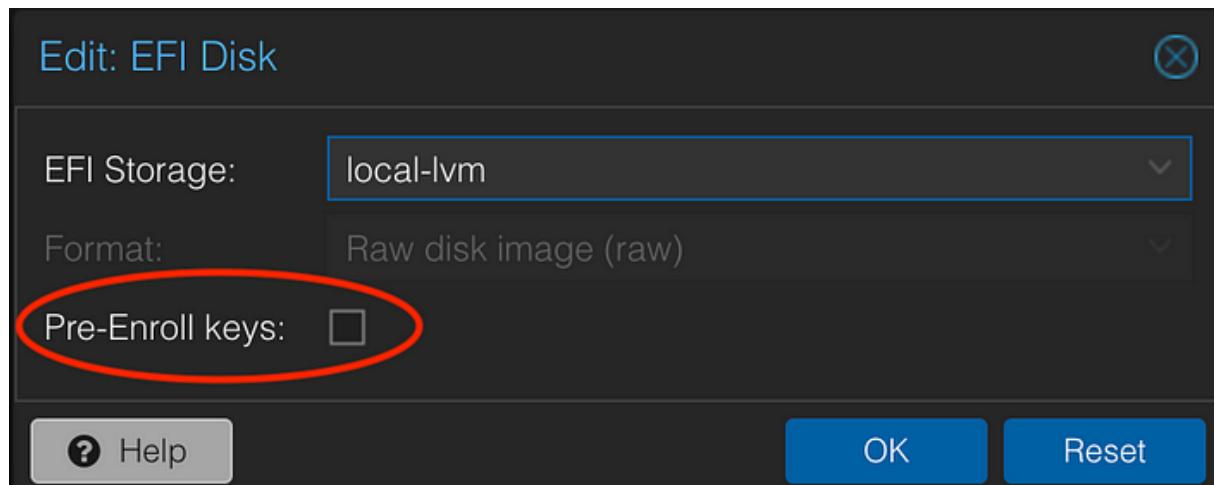
We have the FluxLive iso loaded in the CD/DVD Drive

| Add | Remove | Edit | Disk Action | Revert |
|-----------------------|---|------|-------------|--------|
| Memory | 8.00 GiB | | | |
| Processors | 4 (2 sockets, 2 cores) [host] | | | |
| BIOS | OVMF (UEFI) | | | |
| Display | Default | | | |
| Machine | Default (i440fx) | | | |
| SCSI Controller | VirtIO SCSI single | | | |
| CD/DVD Drive (ide2) | local:iso/FluxLive-1734438219.iso,media=cdrom,size=2414976K | | | |
| Hard Disk (scsi0) | local-lvm:vm-112-disk-3,discard=on,iothread=1,size=220G,ssd=1 | | | |
| Network Device (net0) | virtio=0A:E1:E3:E1:B7:72,bridge=vmbr2 | | | |
| EFI Disk | local-lvm:vm-112-disk-0,efitype=4m,size=4M | | | |
| TPM State | local-lvm:vm-112-disk-2,size=4M,version=v2.0 | | | |

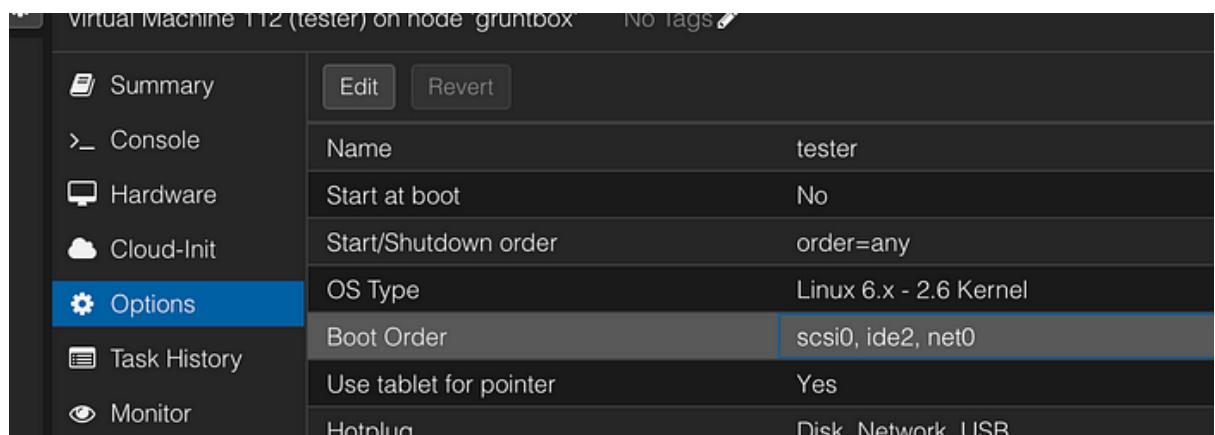
Note the Processor type (host), OVMF (UEFI) bios, TPM (v2.0) and EFI Disk.

Important! When you add the EFI disk, make sure you untick “Pre-Enroll keys” this will put the UEFI in “setup mode”, which allows us to install our own Platform Key to secure the system.

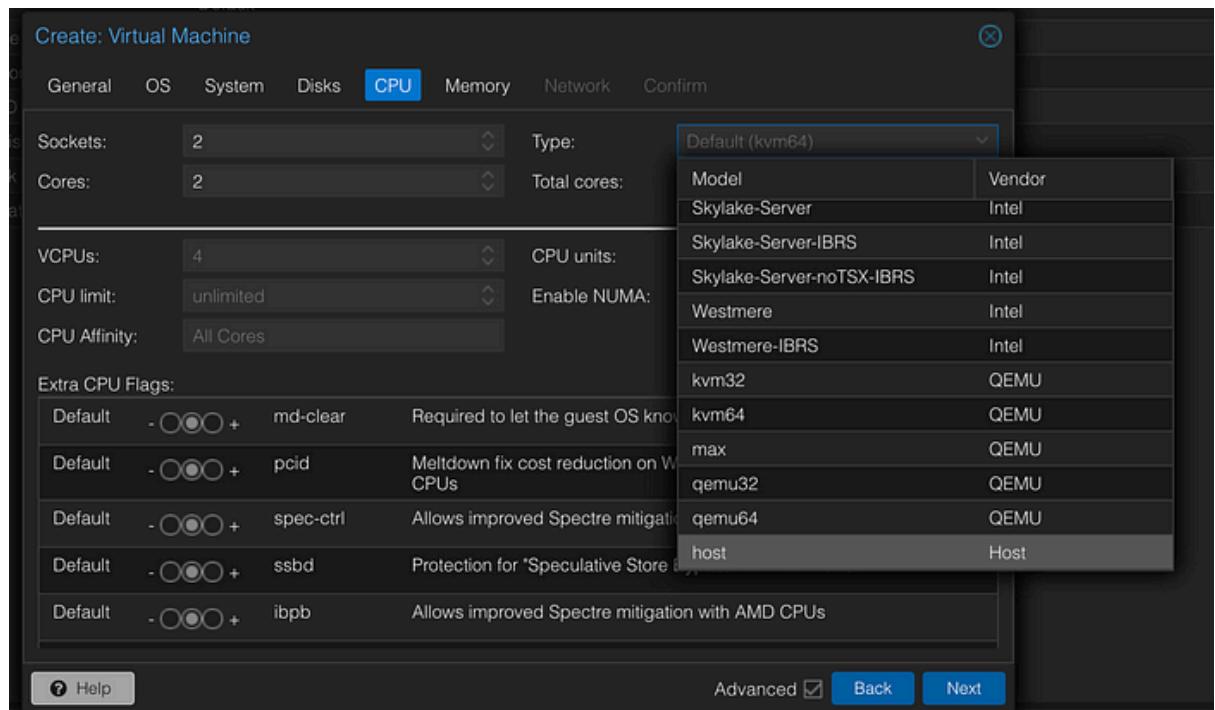
If you fail to untick this, you will get a warning message when the image first boots.



If you click on “options” on the left, we also need to make sure the hard drive is before the cdrom in the boot order.

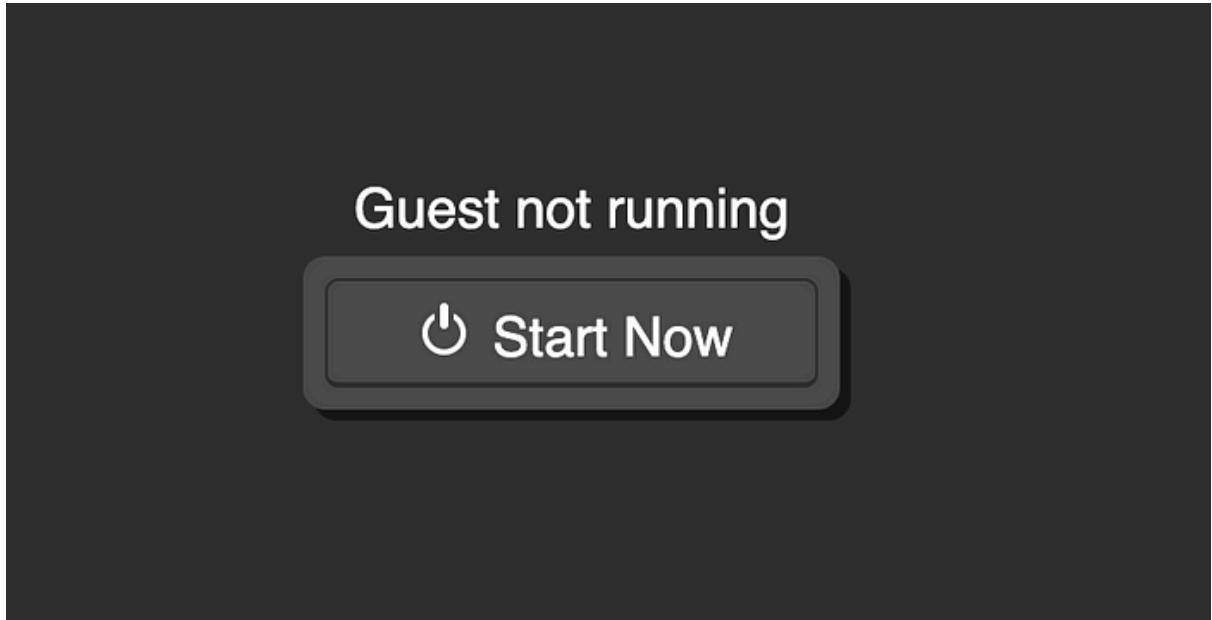


It is also important to note, the CPU should generally be set to type “host”



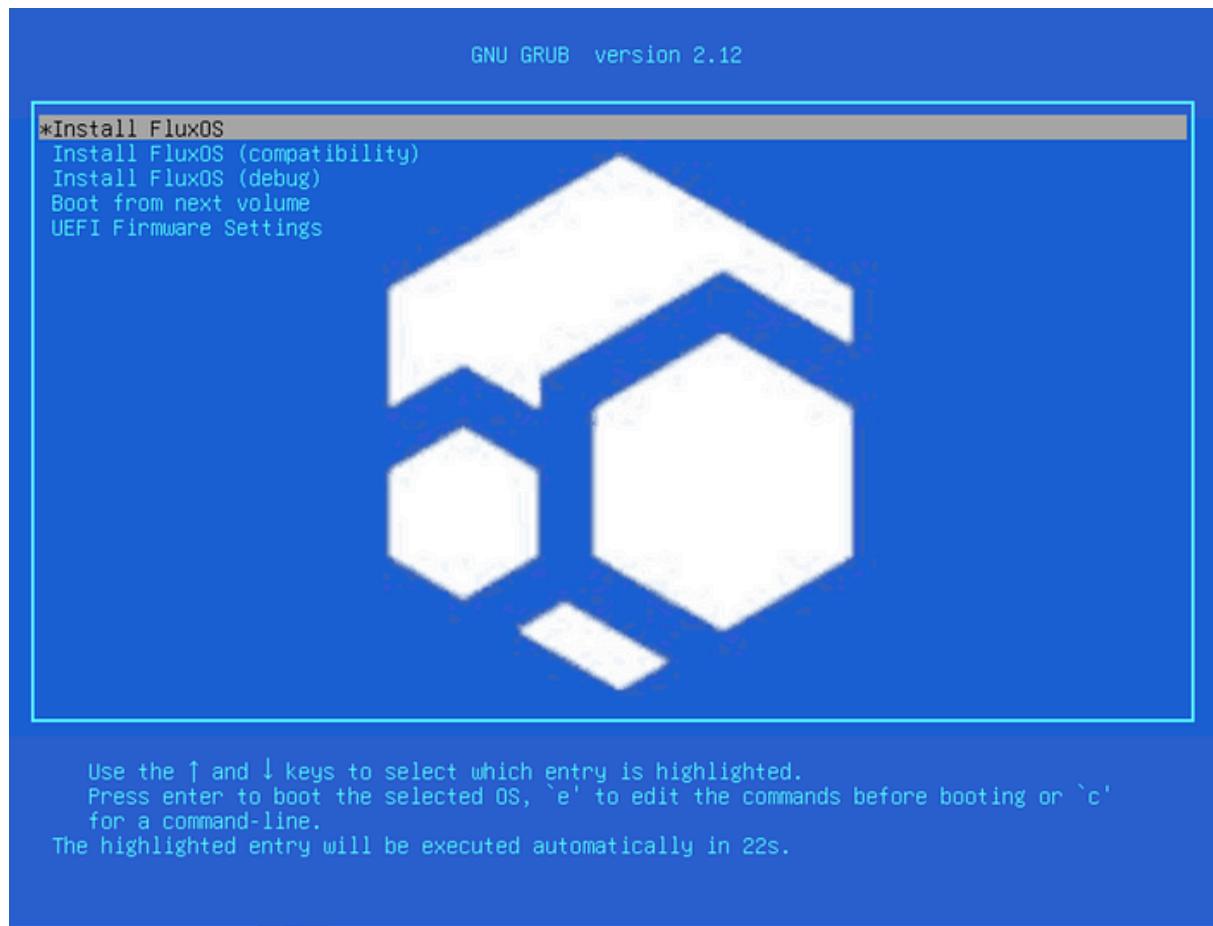
If you leave this as the default, AVX support will be disabled and you will get a warning when you start the image.

Continue to the console tab on the left, and click start.



After several moments, you will be presented with the Grub loader screen. There are several options here, but always start with the default “Install FluxOS” option (just hit enter)

If you try that, and you get issues, like a bad display, try the compatibility mode or debug mode, but only as a last resort.

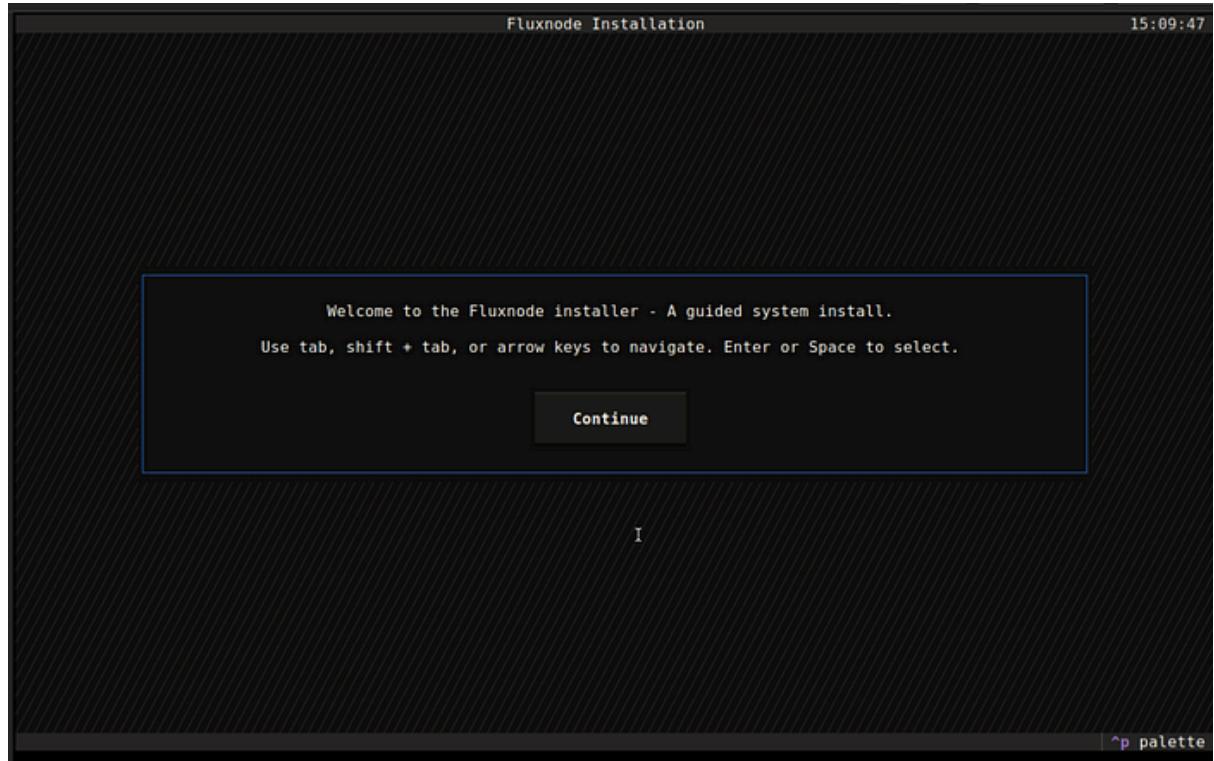


After about 10–20 seconds, it will load the splash screen below

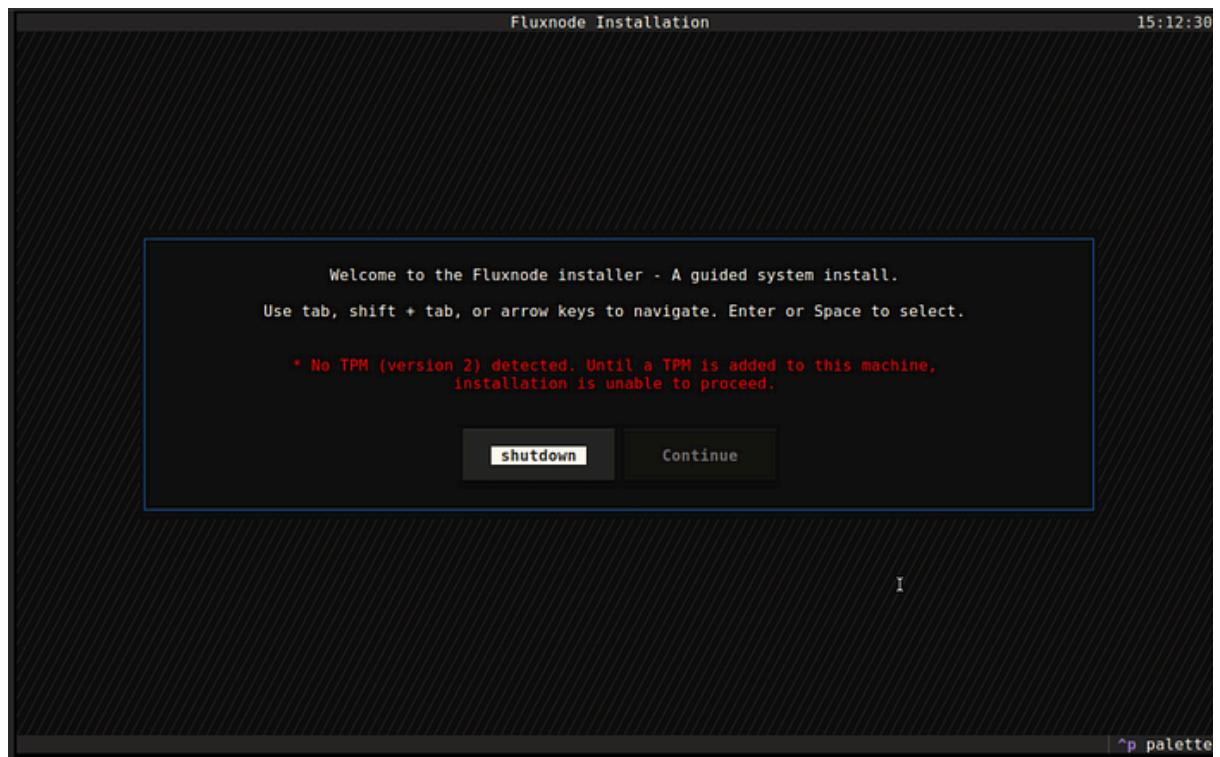


and shortly after that, the main installer welcome screen.

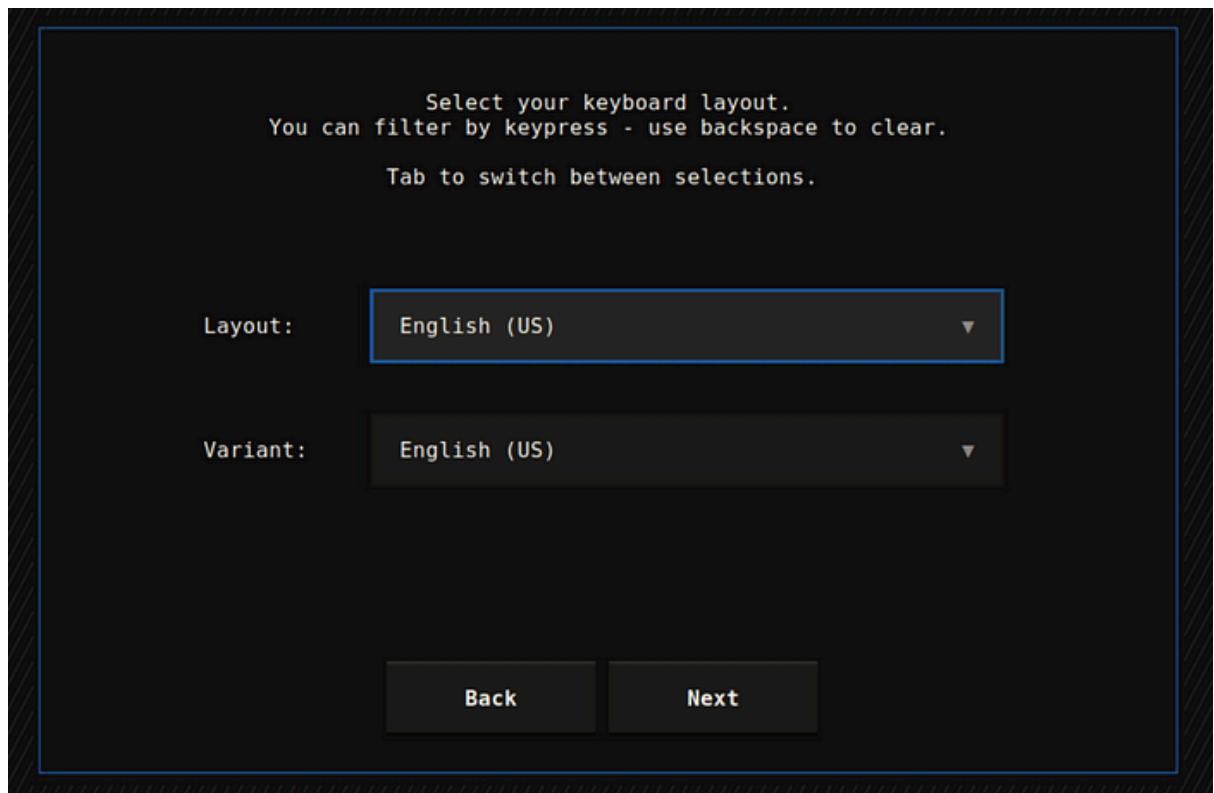
This is what it looks like if everything is good:



If the system is missing something, it will tell you, and the system will need to be shutdown:

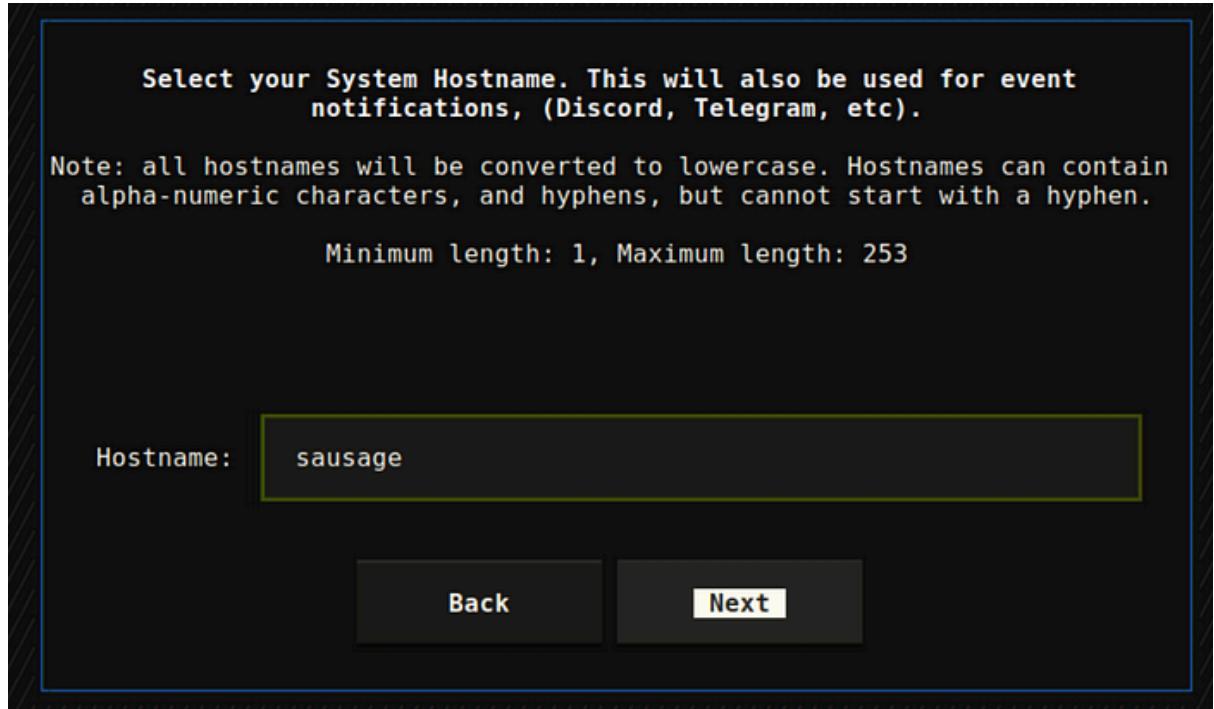


If everything is all good click continue to move to the keyboard selection.



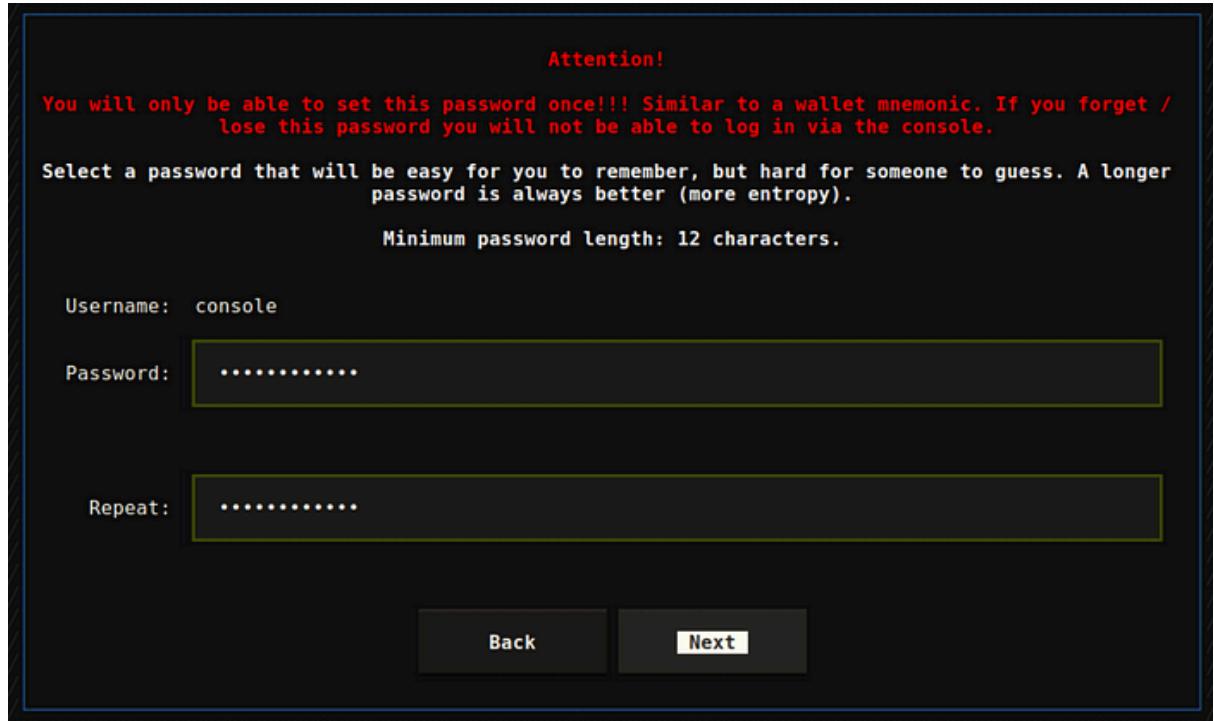
Using either your keyboard or mouse, select your desired keyboard layout. If using the keyboard, you can filter by typing the letters of your layout, you can also scroll up/down faster with shift + up/down.

Let's move on to the next screen, the system hostname. This can be used as the identifier for system notifications also if you want.

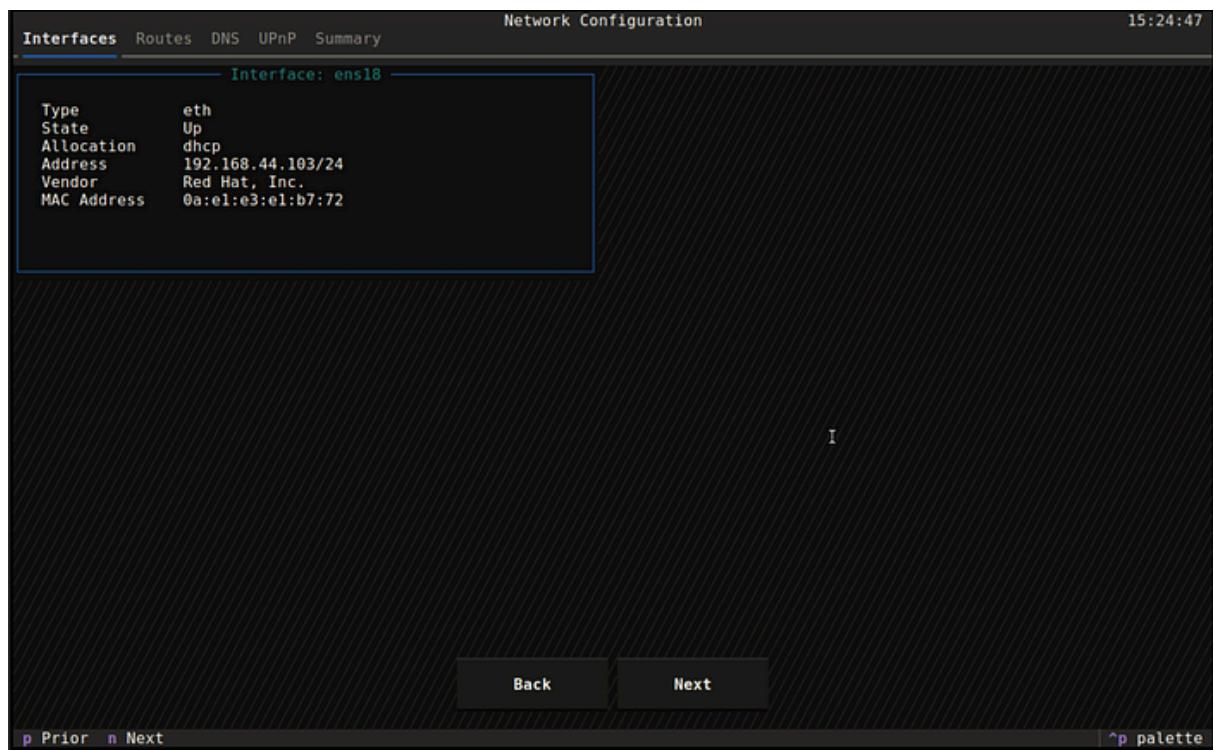


Next up, the console password.

FluxOS Embedded has been designed to maintain strict operational access and Role Based Access Control. (RBAC) As such, there is only one user that has access via the console. The “**console**” user. Here we are setting up that user.

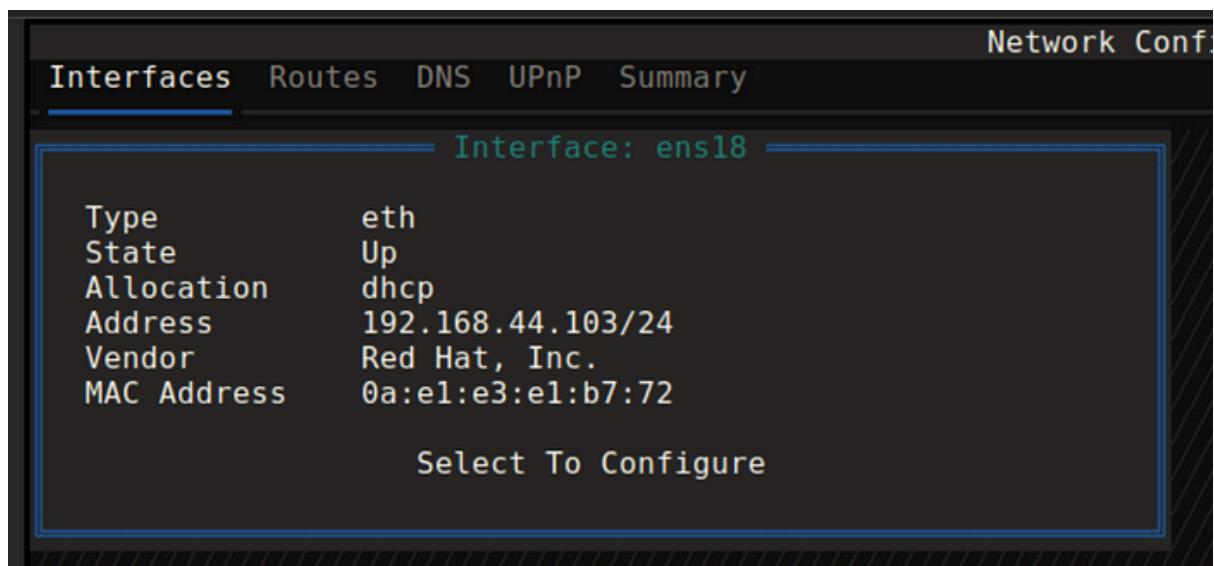


Next is the network setup. There will be a list of network interfaces here. Generally, you will only have one interface. You can either press down to configure, or click on the interface.

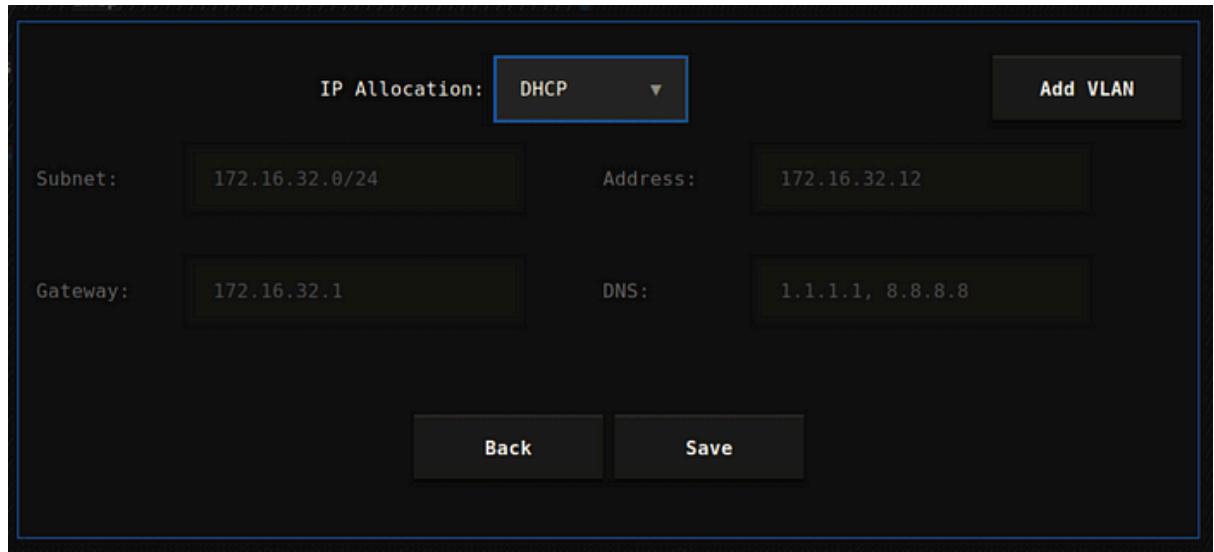


For example, let's say we want to set a static IP for this node.

press down, and hit enter.

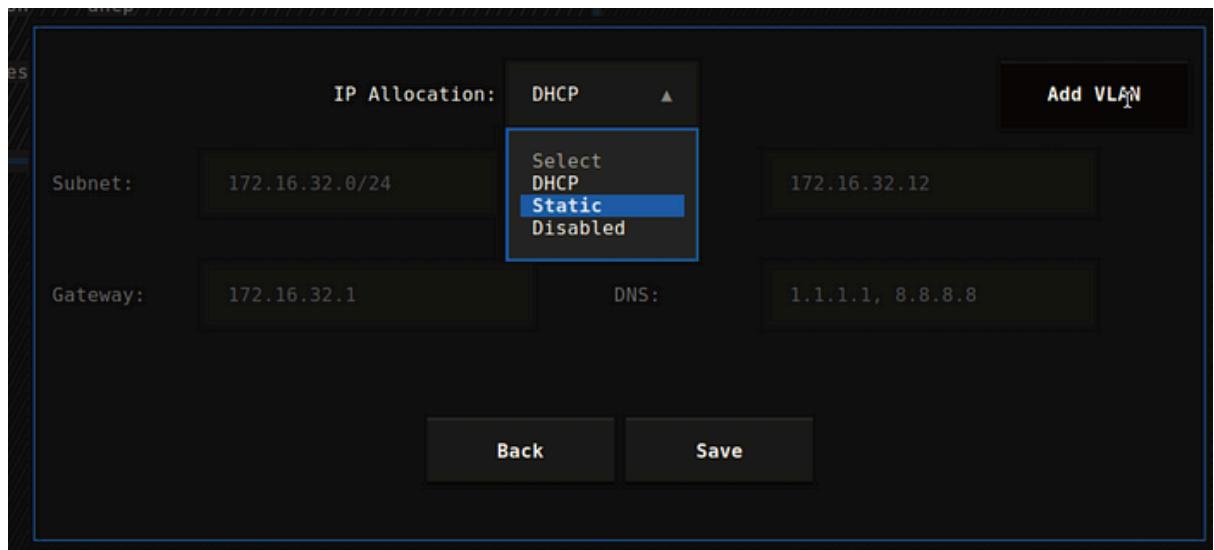


This will bring up the interface configuration modal.



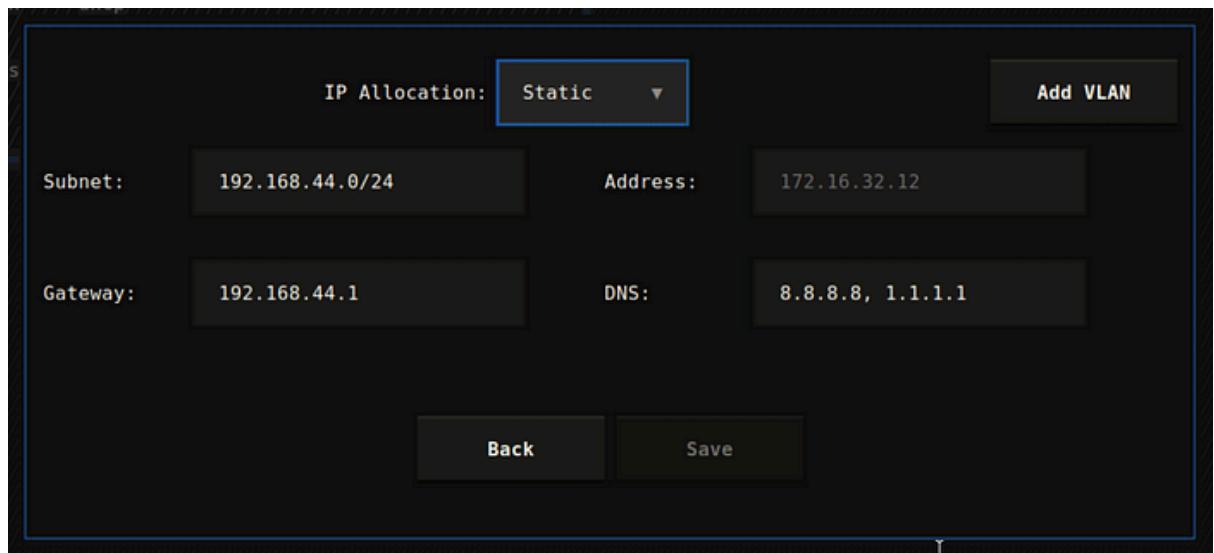
You can add a VLAN subinterface here if you like, and configure addressing on that, but we're not doing that here today.

If you hit enter, then select static.

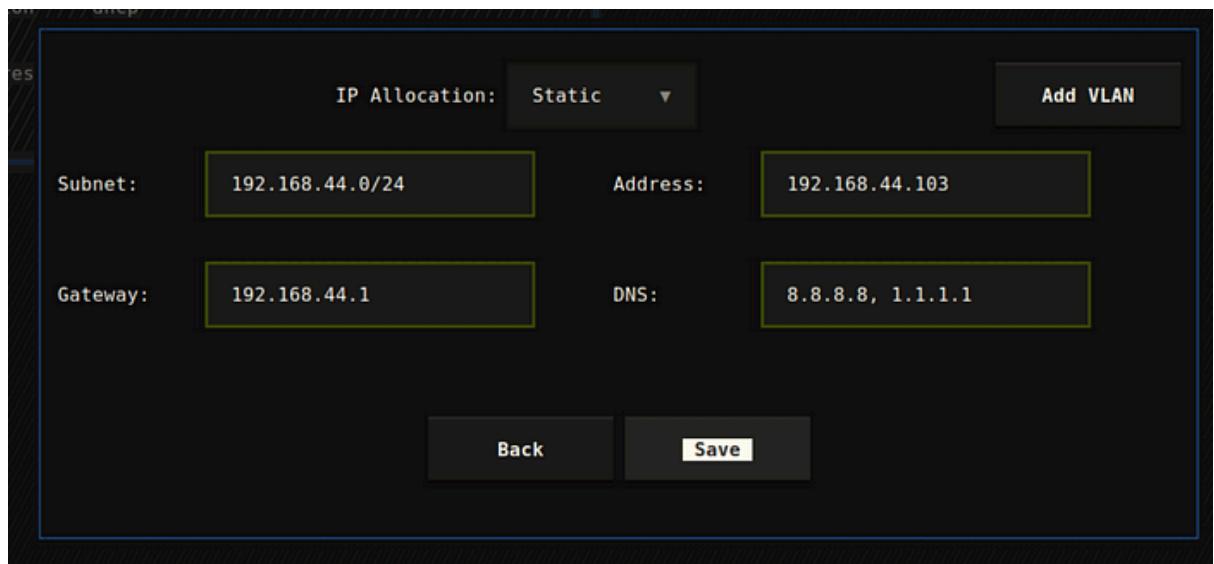


You then get presented with the static IP configuration options. If FluxOS gains an IP via DHCP, it will pre-fill out the options for you. If this is undesirable, you can delete these options.

Tab over to the address, and add your desired IP.



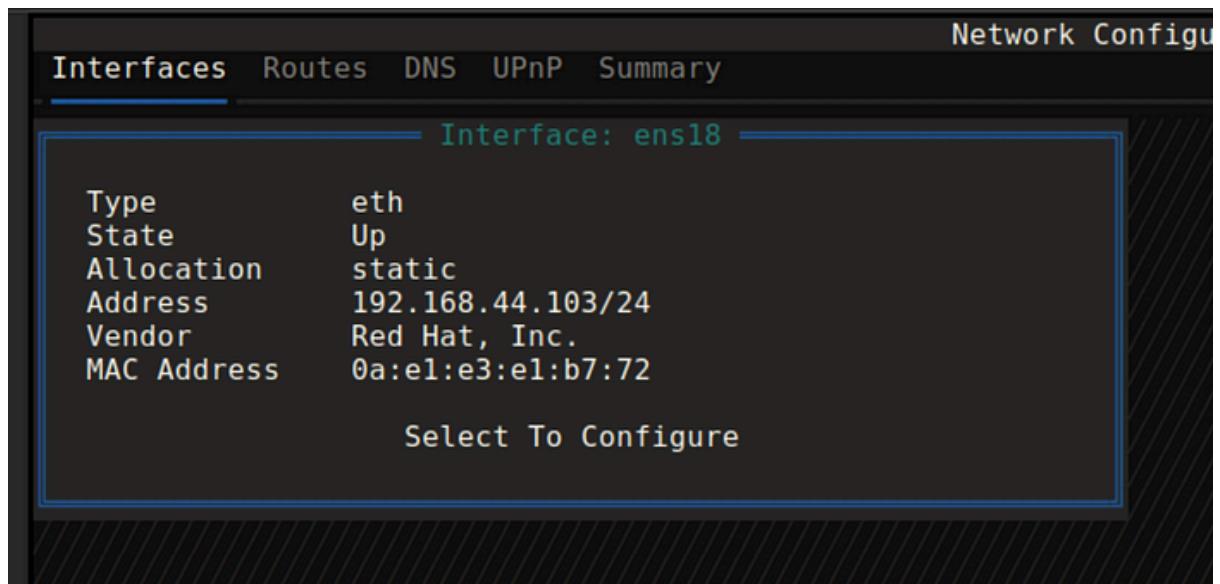
ArcaneOS also takes the liberty of adding your current DNS.



Click Save

This will show a brief loading screen, as your interface is being reconfigured.

Once the interface is reconfigured:

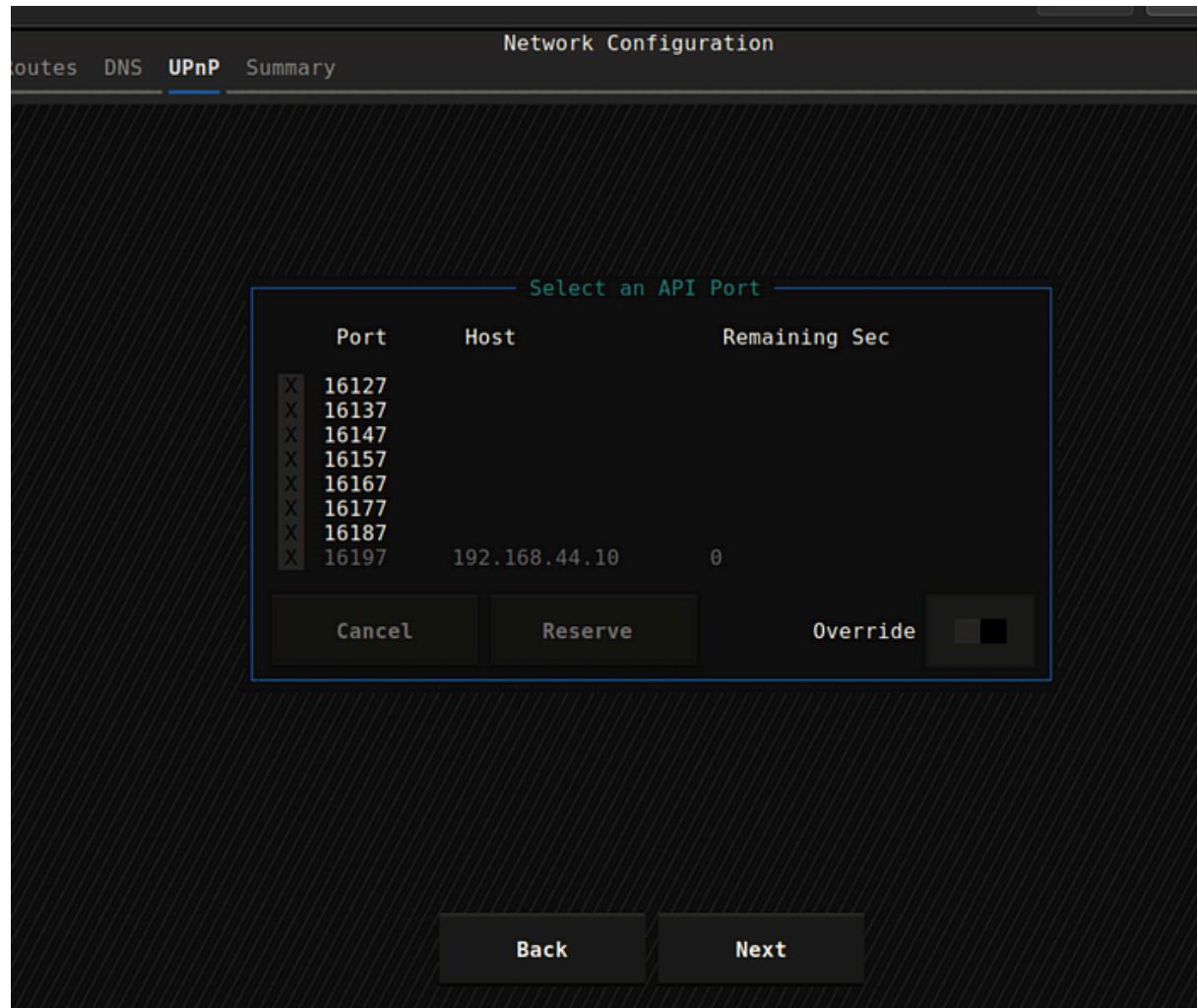


We can then move across (with right arrow or mouse) to routes.

You will see the “under construction” for both Routes, and DNS. These will be available soon.

Routing changes coming soon

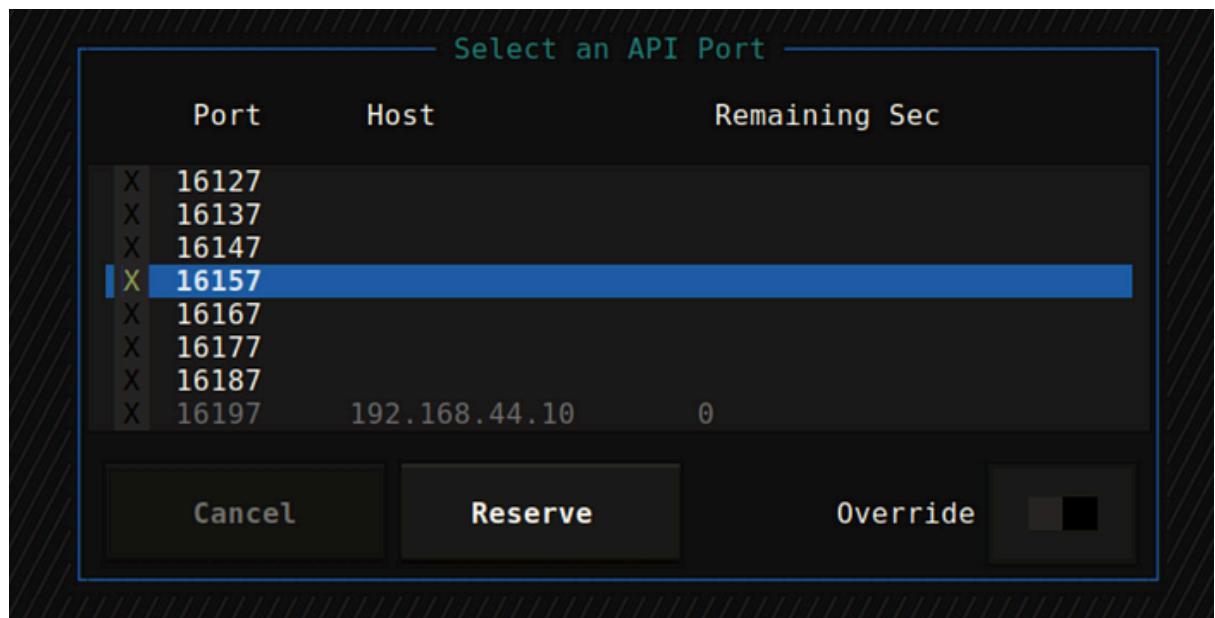
Skip on over to UPnP



This screen gives you an overview of nodes on your network.

Here, we can see there is a node already running on api port 16197, hence why it is greyed out.

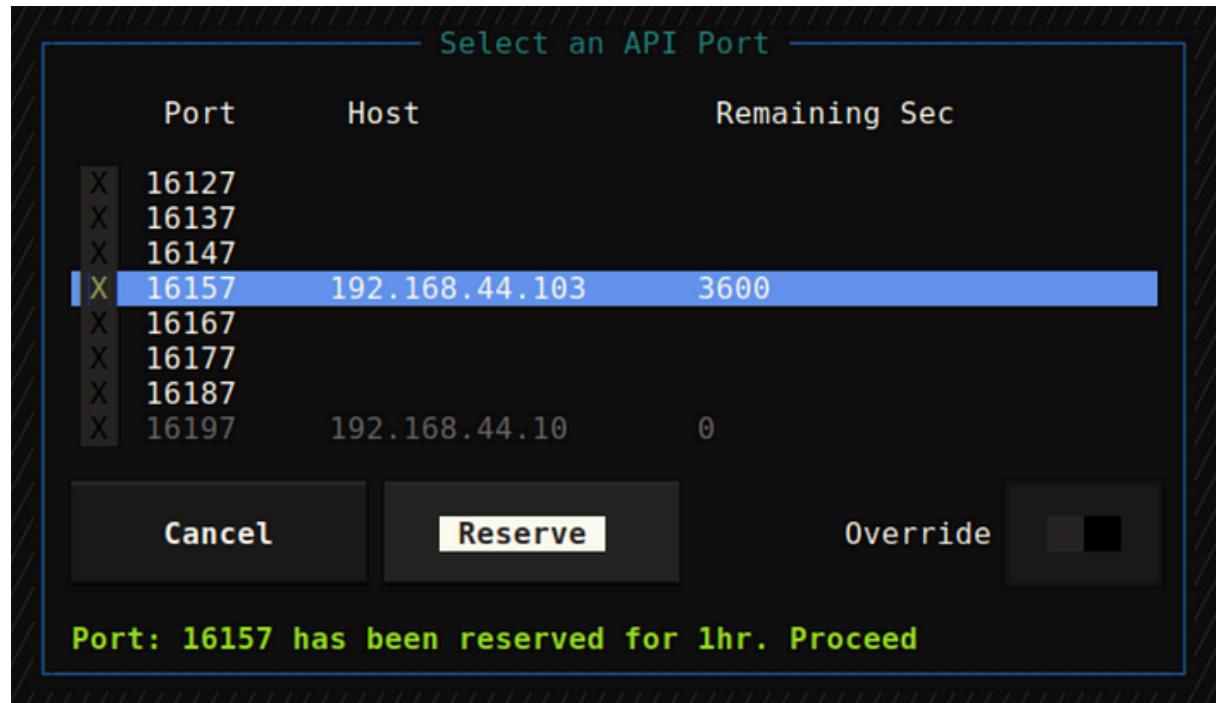
If you are not running UPnP, just skip ahead to the summary screen.



Here, we have used the arrow keys to scroll down to port 16157, hit space or enter to select.

At this point, you could continue on and it will set up the node with api port 16157. However, a good option, especially if you

are setting up multiple nodes, is to “reserve” the port. Hit tab and then enter.

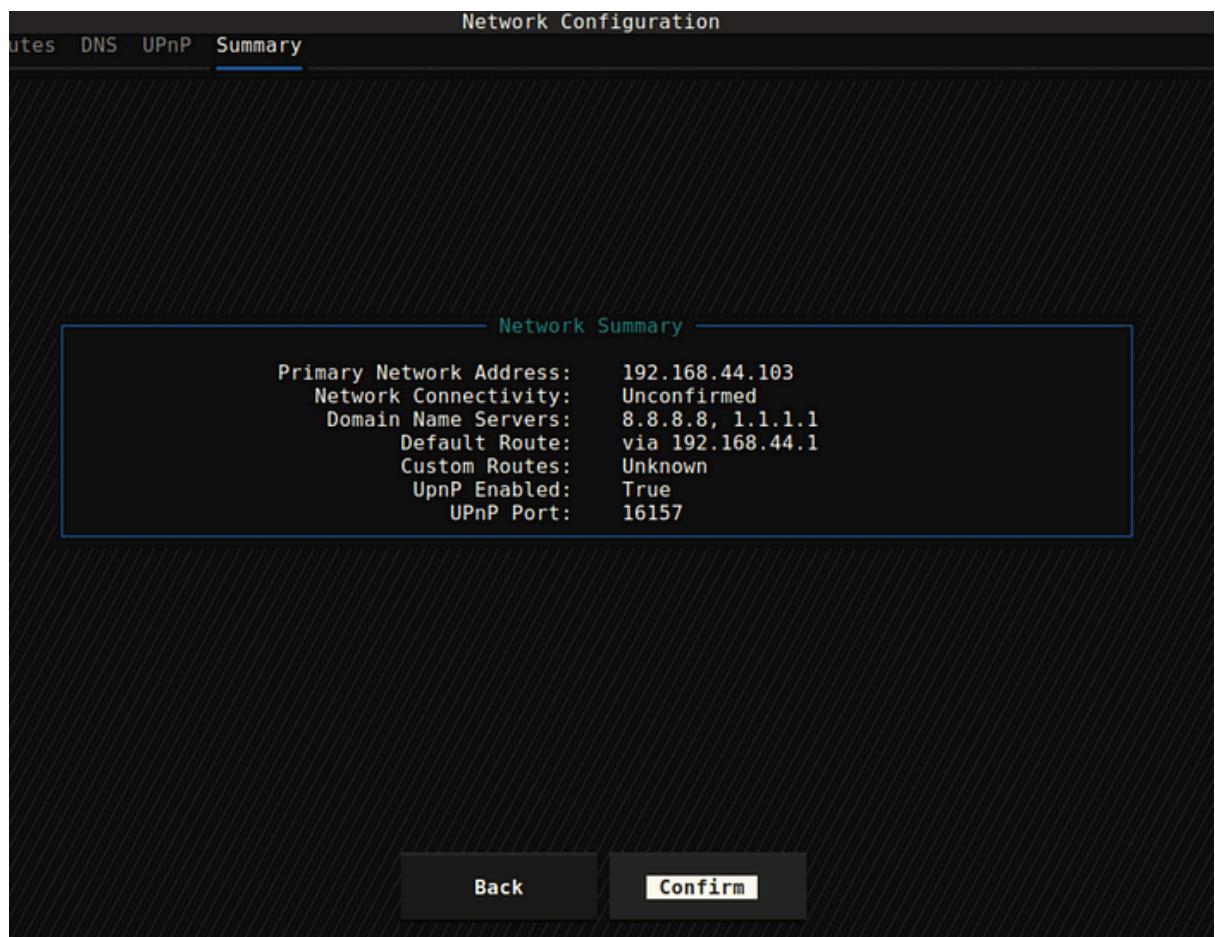


This sends a mapping request off to your router to reserve the port for one hour. This stops any other IP on your network from being able to use this port for 1 hour.

Of note, if there is a mapping for a port that you are sure is no longer being used, i.e. you've just shut down another node or something, you can override this selection with the override switch. This will allow you to select any port, regardless of

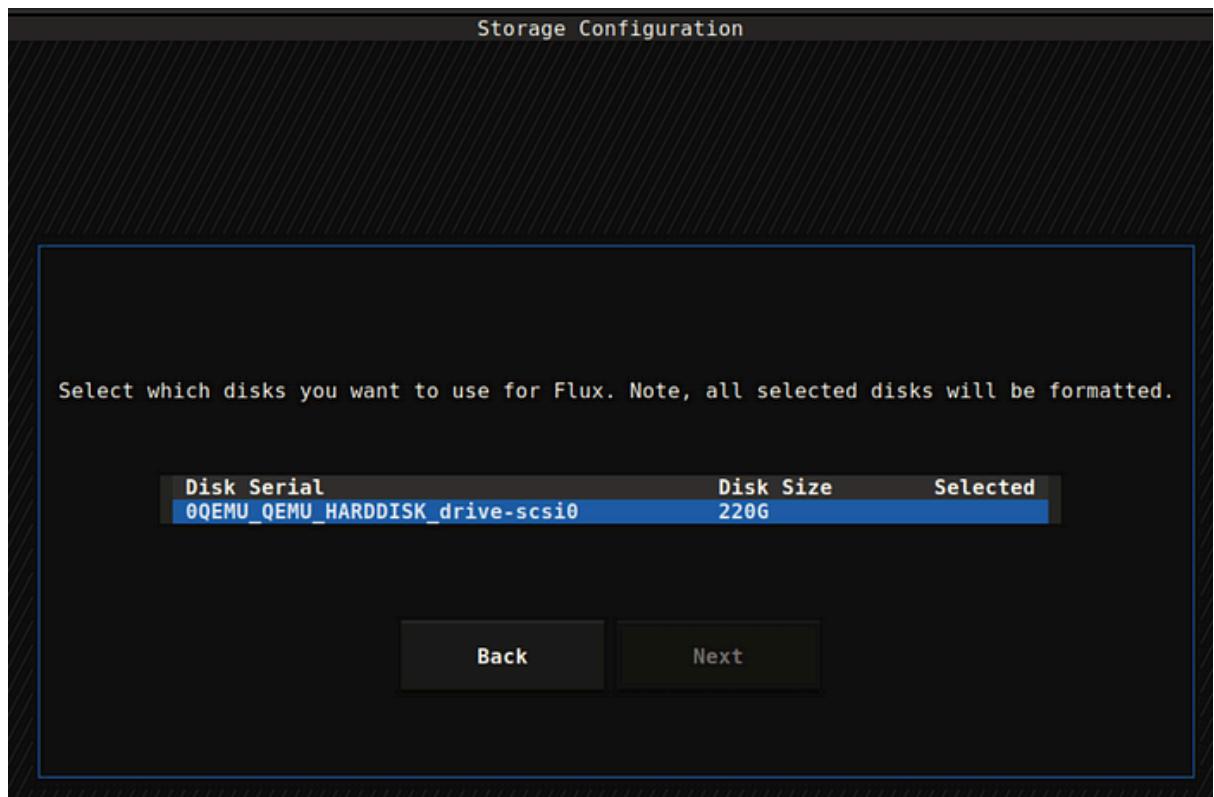
what mappings exist already. Be very cautious using this override.

You can now tab / click next to go to the upnp summary.



Here you will get a rough summary of the options chosen (this will get expanded with more details soon)

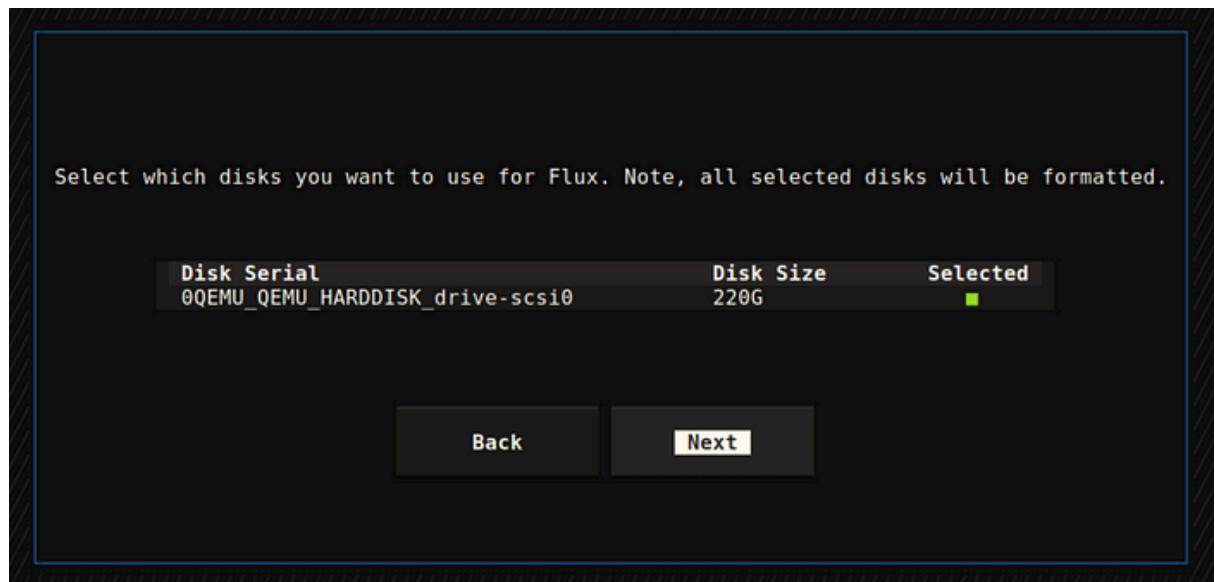
Click confirm to move on to disk selection.



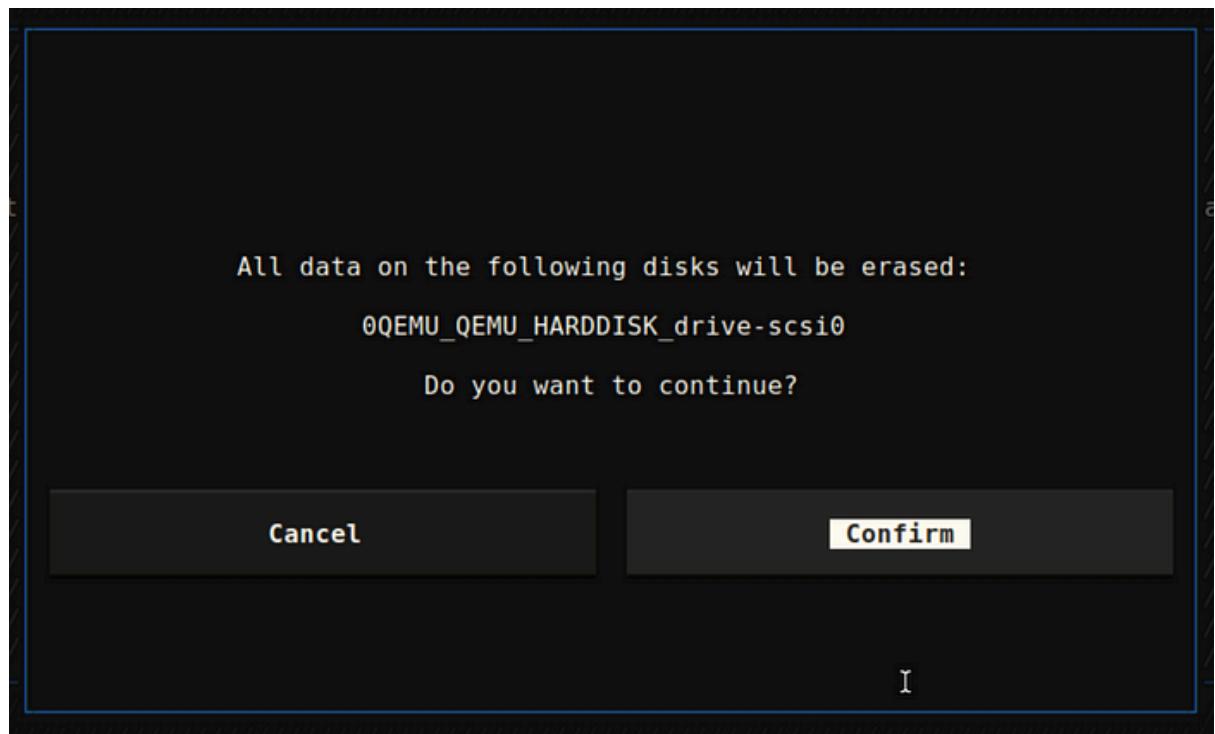
FluxOS runs an exotic disk configuration. All disks are encrypted. You can add as many disks as you like, they all get merged into a single LVM and filesystem that is presented to the flux node.

All you have to do is select which disks you want to use. As you can see, I only have one disk available here. Use Enter / Space / Click to select.

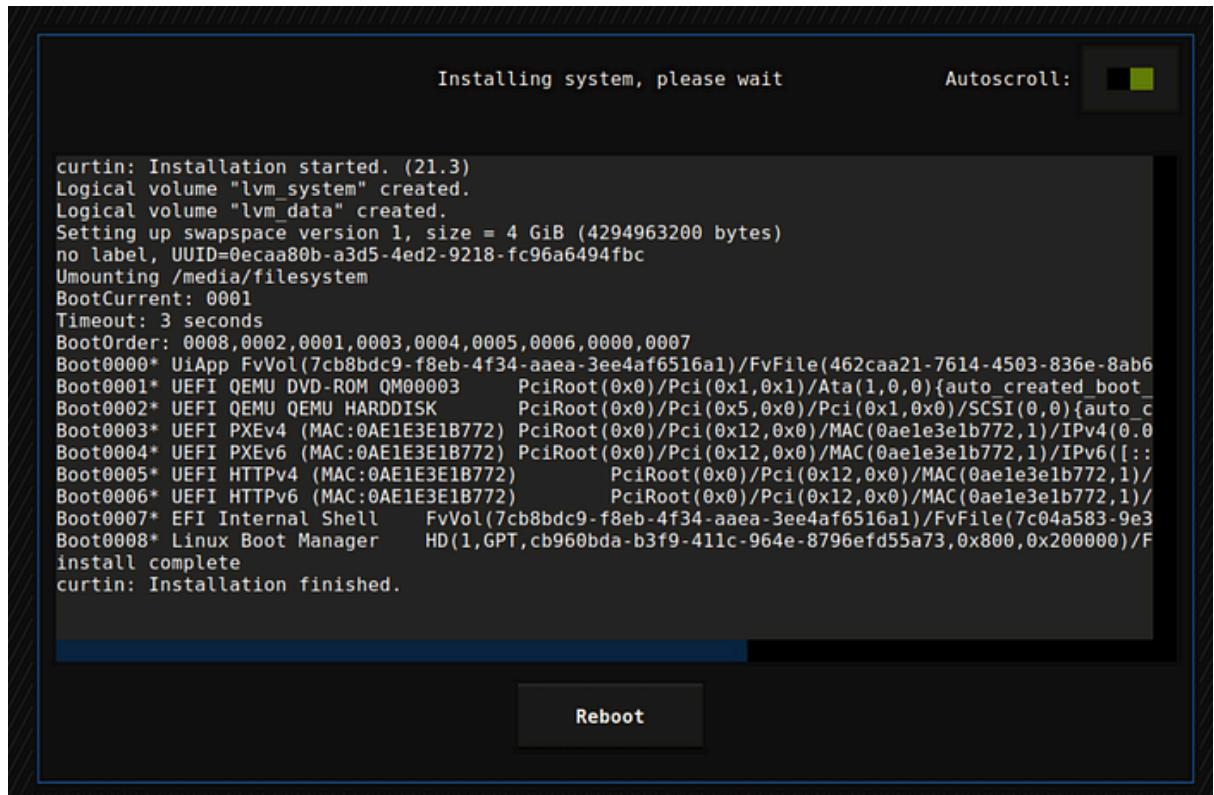
Tab over to next and hit enter.



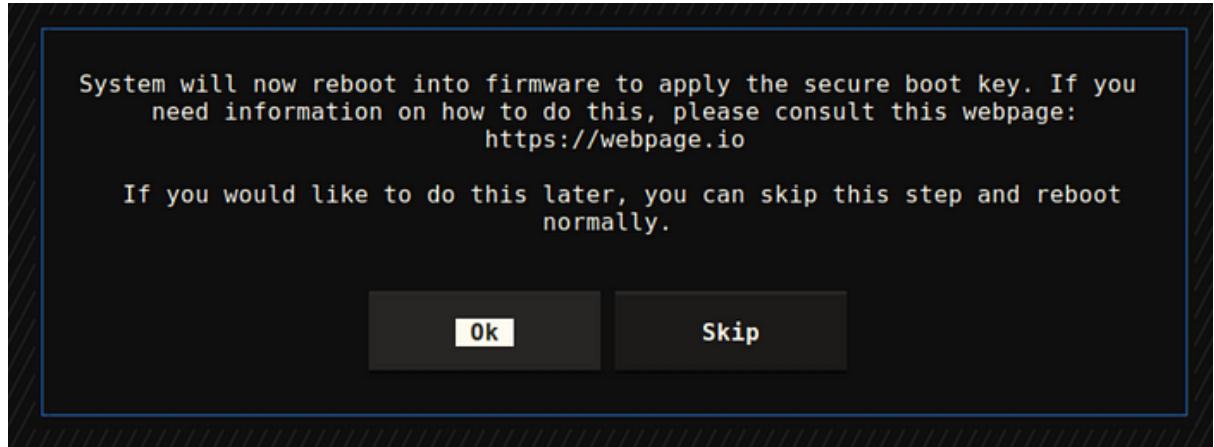
This will bring up an overlay, double check that you have selected the correct disk, and continue.



This will start writing the installation to disk. Sit back for a minute while the installation completes. Tab to the reboot button and hit enter.

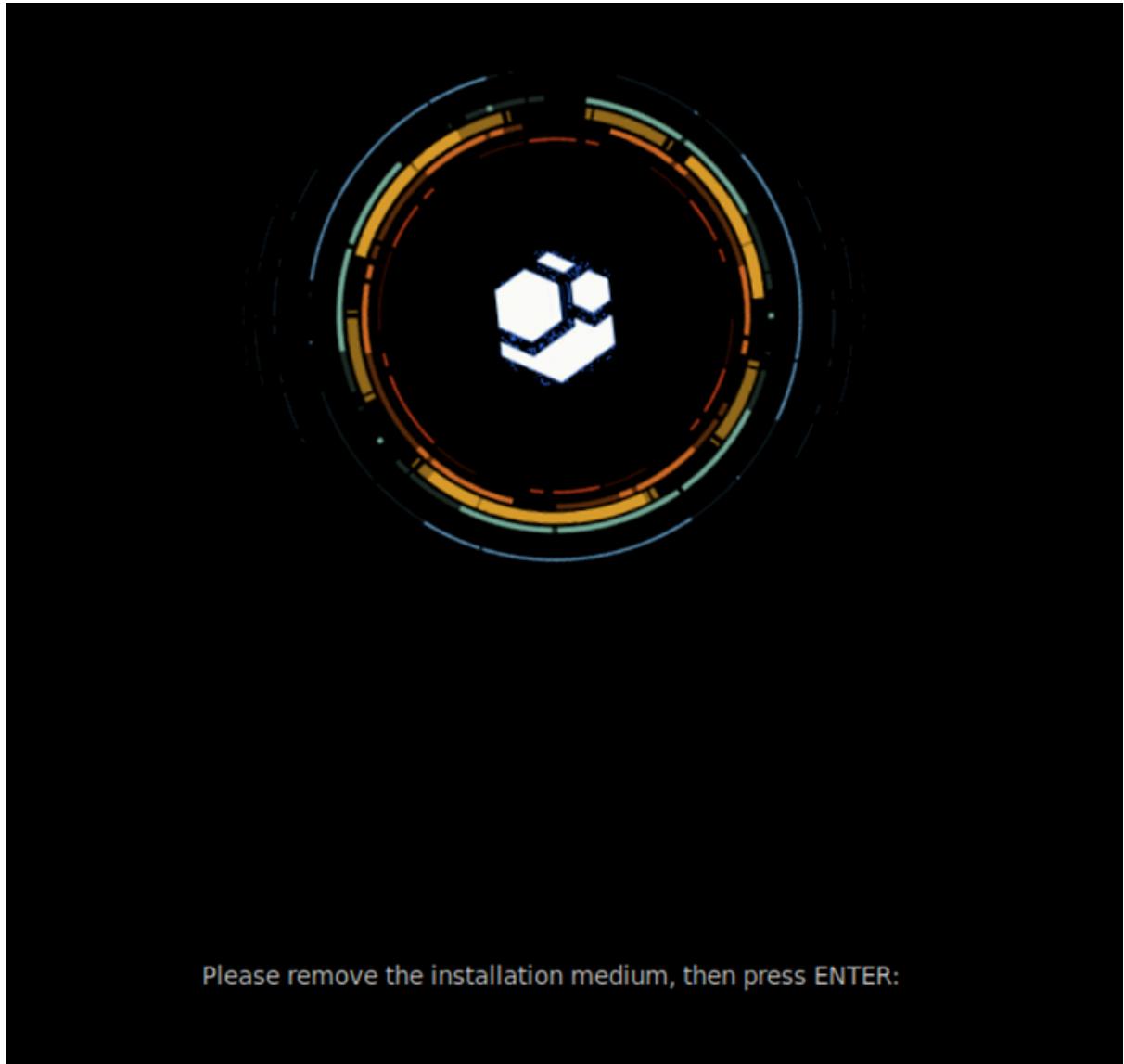


If this is your first install on this machine, now is when we want to reboot into UEFI firmware to set the secure boot key.
(Platform Key aka PK)



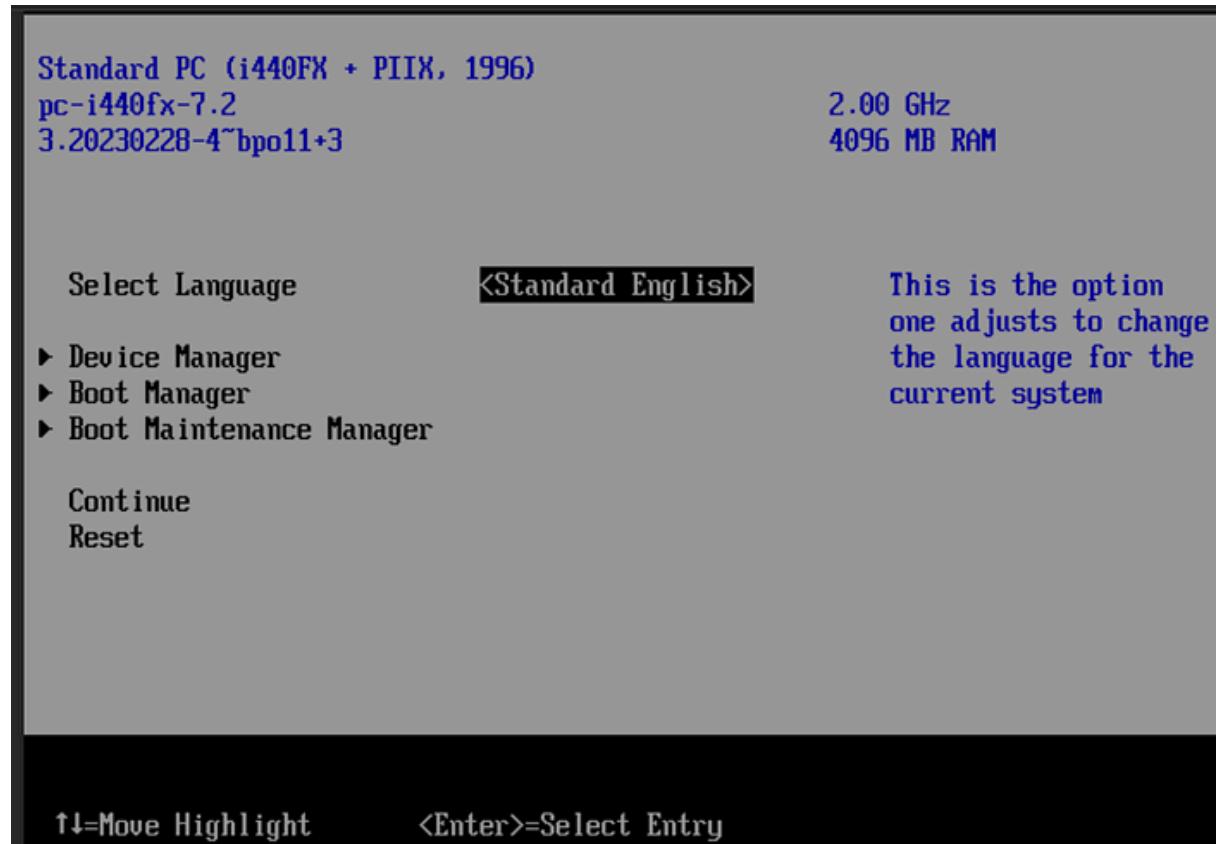
If you have already set the PK before, you can click skip. Note, if you haven't set the PK, and you click skip, the system will boot with secure boot enabled. It may look fine initially, but the system will get locked down before the node is confirmed.

Hit Ok. This will then load the final splash screen, where you need to hit enter again to continue.



This will automatically take you into your system's firmware menu. This differs for each hardware vendor, consult your vendor's documentation on how to reset the secure boot key. On some motherboards, you have a dropdown asking for operating system type on secure boot, selecting windows should do the trick.

Here is the OVMF firmware menu



Select Device Manager, then secure boot configuration.

Devices List

- ▶ Secure Boot Configuration
- ▶ Driver Health Manager
- ▶ RAM Disk Configuration
- ▶ Tls Auth Configuration
- ▶ OVMF Platform Configuration
- ▶ iSCSI Configuration
- ▶ Network Device List

Press ESC to exit.

Then select secure boot custom mode.

Secure Boot Configuration

Current Secure Boot State Disabled
Attempt Secure Boot []
Secure Boot Mode <Standard Mode>
Reset Secure Boot Keys

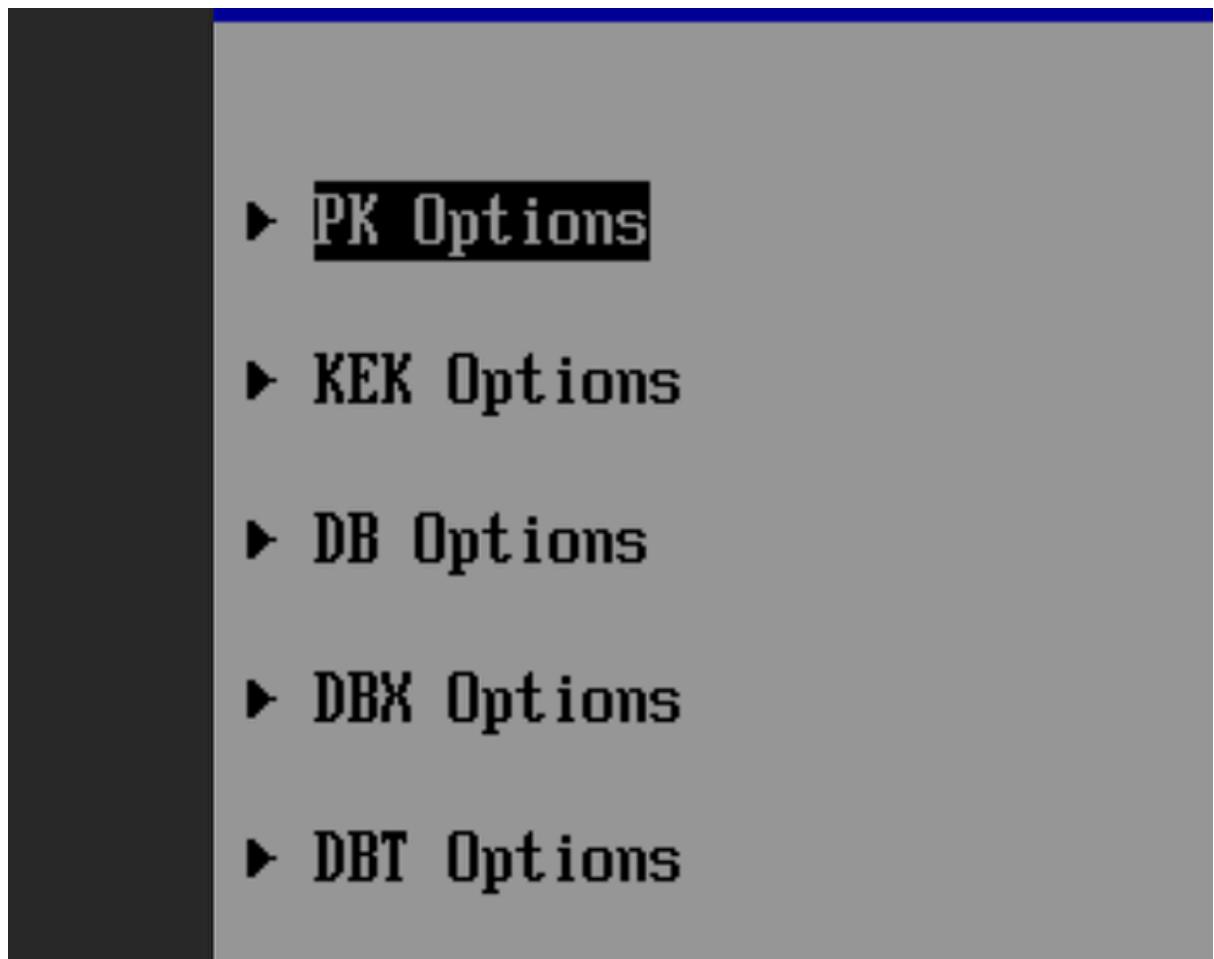
Standard Mode
Custom Mode

Then select custom secure boot options.

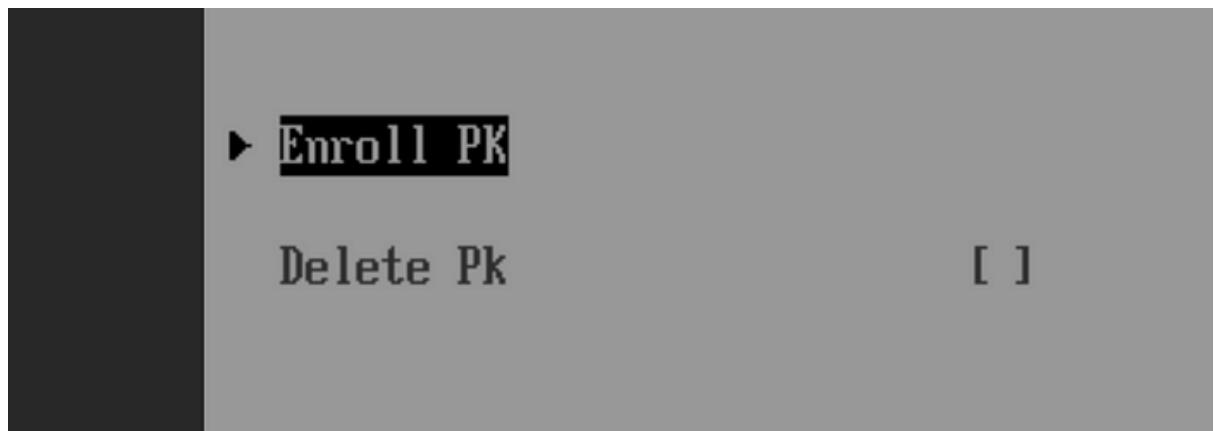
Secure Boot Configuration

Current Secure Boot State Disabled
Attempt Secure Boot []
Secure Boot Mode <Custom Mode>
► **Custom Secure Boot Options**
Reset Secure Boot Keys

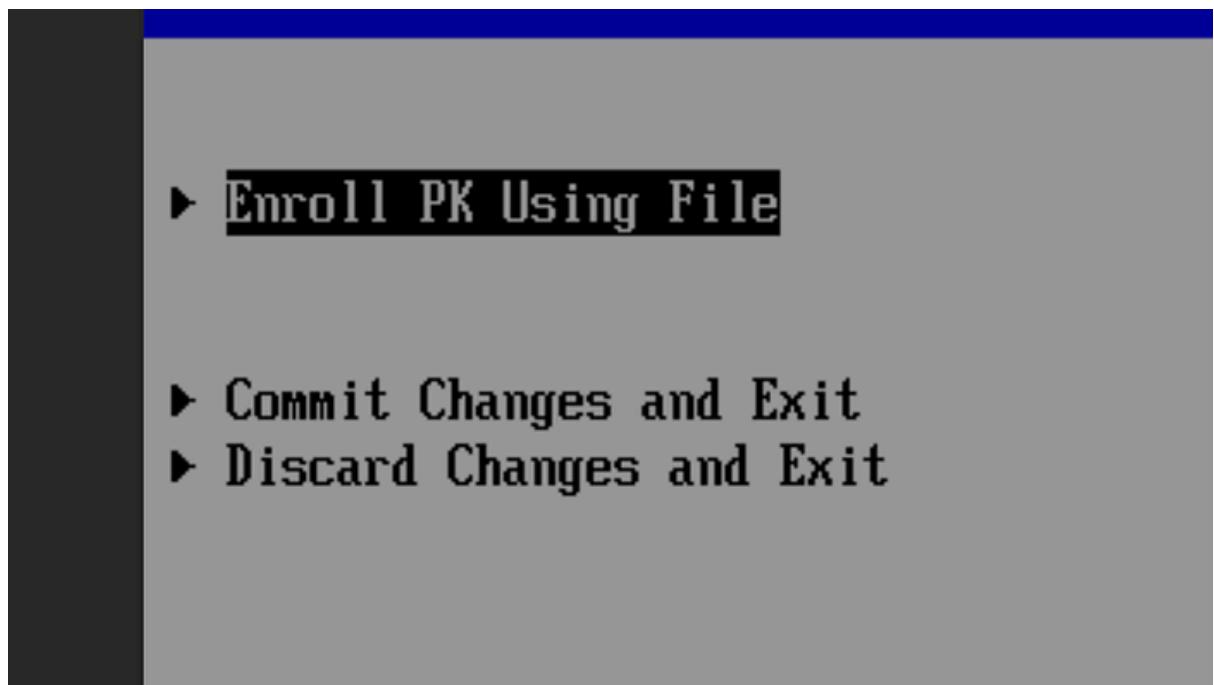
Then hit PK Options



Then Enroll PK



Then Enroll PK using file



When we build the image, we load all the public keys onto the boot partition of the drive. We are going to navigate there now.

Select “boot”

File Explorer

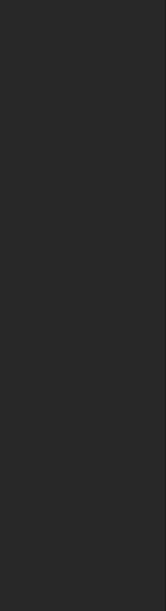
- ▶ boot,
[PciRoot (0x0) /Pci (0x5,0x0) /Pci (0x1,0x0) /Scsi (0x0,0x0
) /HD (1,GPT,A27E0220-3B8F-4604-A8A8-133332F70BA7,0x80
0,0x219800)]
- ▶ ESP,
[PciRoot (0x0) /Pci (0x1,0x1) /Ata (Secondary,Master,0x0)
/CDROM (0x1,0xF3000,0x279C)]

Next, loader

- ▶ ***NEW FILE***
- ▶ ***NEW FOLDER***

- ▶ <EFI>
- ▶ <loader>
- ▶ <network>
- ▶ <store>

Keys



- ▶ <.>
- ▶ <..>
- ▶ <entries>
- ▶ **<keys>**

entries.srel
loader.conf

Then FluxOS



- ▶ ***NEW FILE***
- ▶ ***NEW FOLDER***

- ▶ <.>
- ▶ <..>
- ▶ **<fluxOS>**

And finally, we are going to select the key. For OVMF BIOS, they will only accept the PK in DER format. Other firmwares use the auth format.

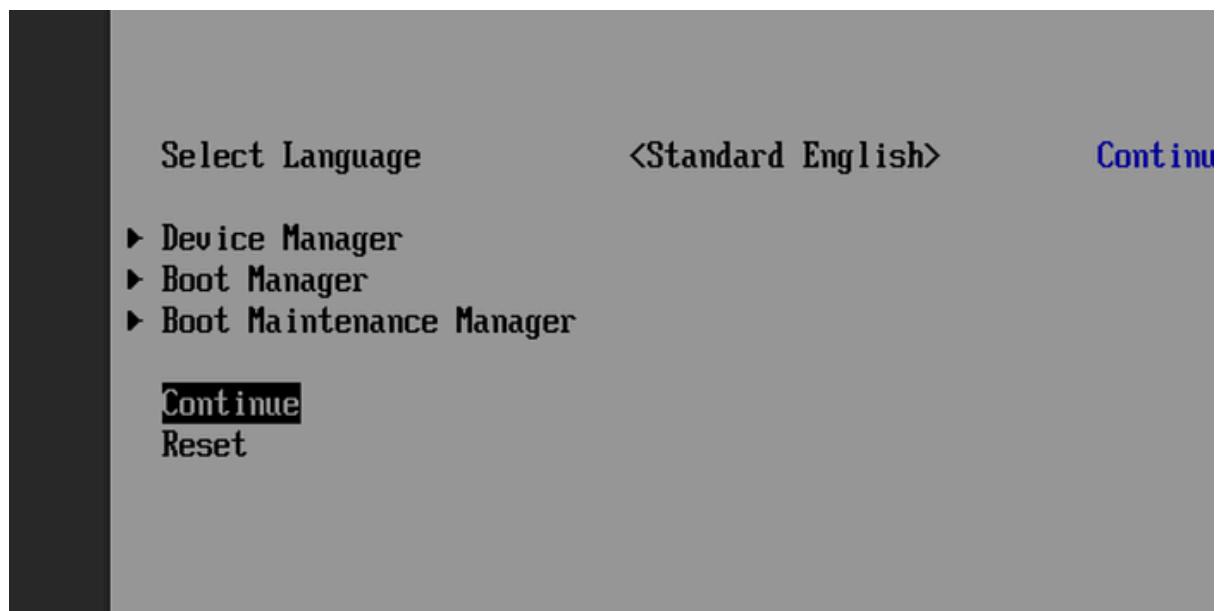
Select pk.der



Here you will see pk.der is selected, then go to commit changes and exit

- ▶ Enroll PK Using File
[pk.der](#)
- ▶ **Commit Changes and Exit**
- ▶ Discard Changes and Exit

Once you have hit commit, you need to press escape 3 times to take you back to the following screen, where you hit continue.



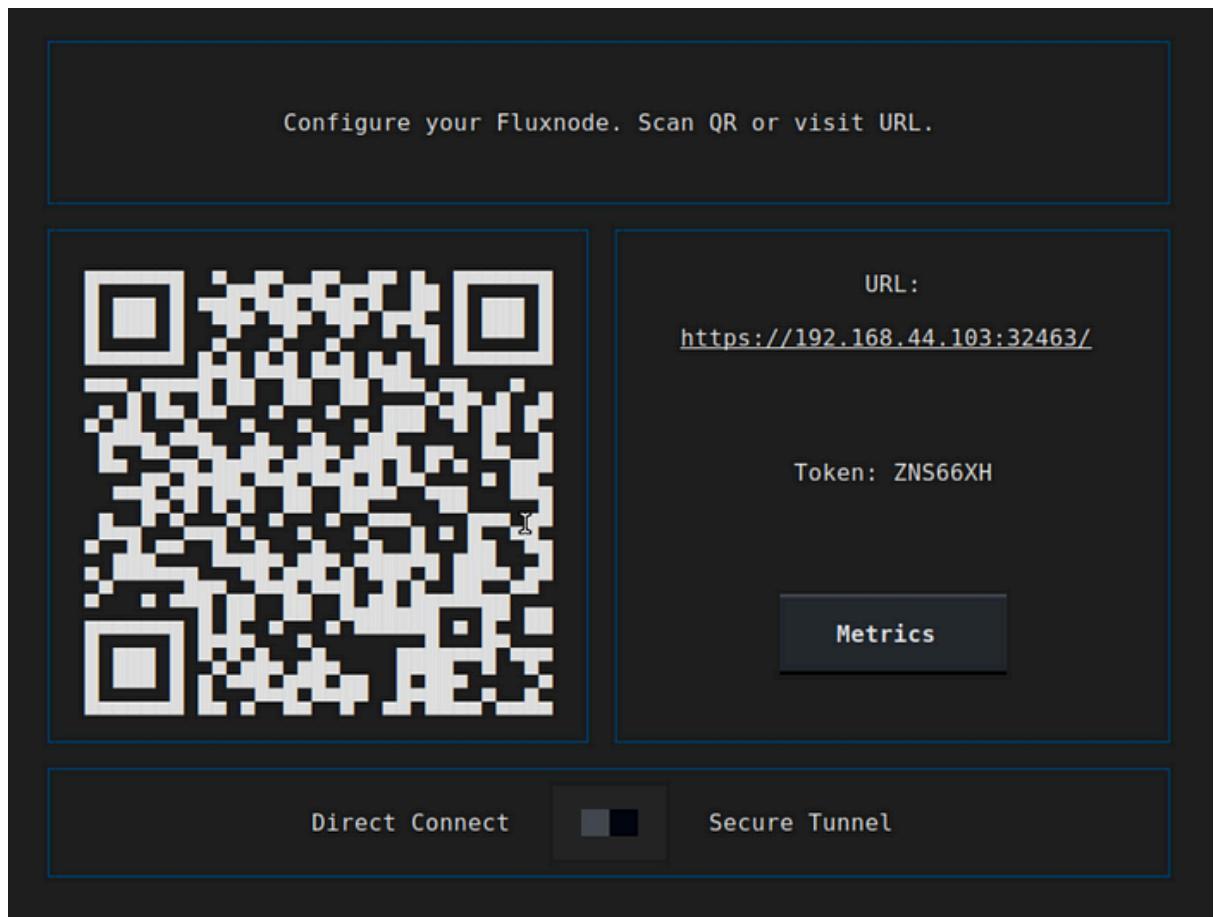
Hit enter on this screen to boot into the new OS with secure boot enabled.



Next, you will see Secure boot enabled and the startup for
ubuntu 24.04



This will now load the system into phase 2 (configuration).
This is where we are booting off our newly installed disk. Once
the system boots, you will be greeted with this screen:



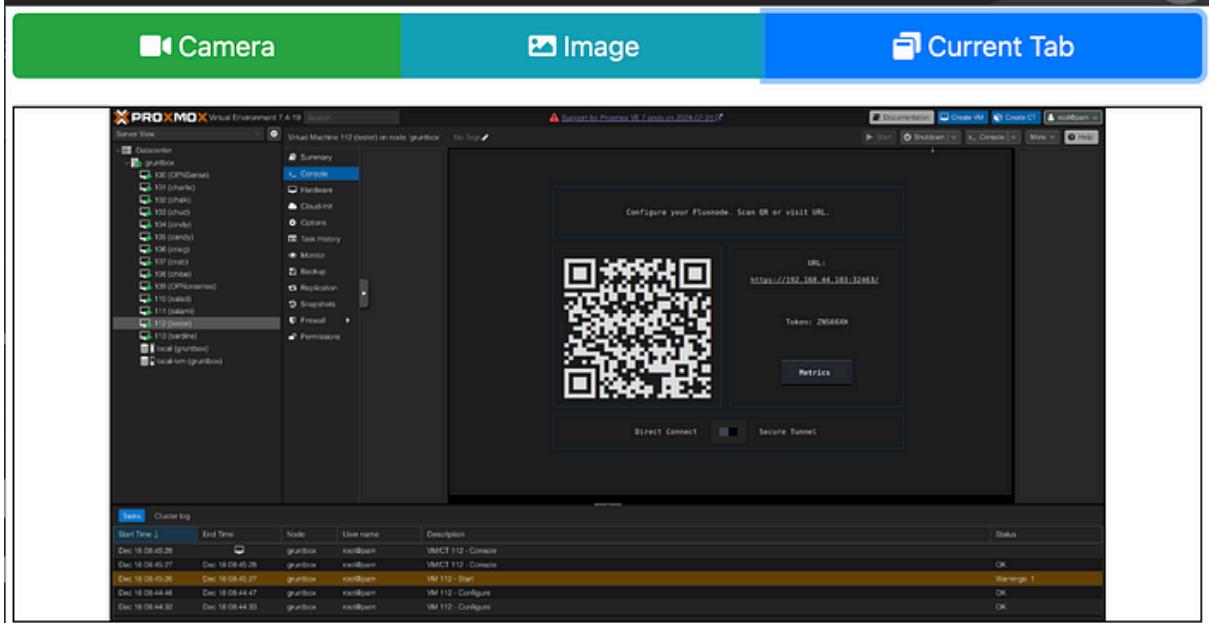
This is the launch screen, which gives you the node's address and port you can connect to, to configure the rest of the node.

Due to the nature of the many different ways you could be viewing this screen, copying and pasting is not enabled at this time.

However, there is a QR code you can scan that will take you to the login page (and present the token automatically)

To scan the QR, you can either use your phone, and complete the config on your phone, (or send it from your phone to your computer)

However, the easiest way I found was to install a QR code reader on chrome and then scan this from your computer.



The screenshot shows the Proxmox Virtual Environment (VE) interface. In the center, there is a window titled "Virtual Machine 112 (cluster) on node (grubbox)" with the URL "https://192.168.44.103:32463". The window displays a QR code with the URL "https://192.168.44.103:32463" and a token "ZNS66XH". Below the QR code, there are two buttons: "DIRECT Connect" and "Secure Tunnel". On the left side of the interface, there is a sidebar with a tree view of "Datacenter" and "Nodes". The "Nodes" section lists several nodes, including "102 (grubbox)", "103 (grubbox)", "104 (grubbox)", "105 (grubbox)", "106 (grubbox)", "107 (grubbox)", "108 (grubbox)", "109 (grubbox)", "110 (grubbox)", "111 (grubbox)", "112 (grubbox)", "113 (grubbox)", "local (grubbox)", and "local-vm (grubbox)". The "112 (grubbox)" node is selected. The main pane also shows a "Cluster log" table with several entries:

| Start Time | End Time | Node | User Name | Description | Status |
|-----------------|-----------------|---------|-----------|--------------------|---------|
| Dec 18 08:45:26 | Dec 18 08:45:26 | grubbox | root@bm | VMCT 112 - Console | OK |
| Dec 18 08:45:27 | Dec 18 08:45:26 | grubbox | root@bm | VMCT 112 - Console | OK |
| Dec 18 08:45:26 | Dec 18 08:45:27 | grubbox | root@bm | VM 112 - Start | Warning |
| Dec 18 08:44:46 | Dec 18 08:44:47 | grubbox | root@bm | VM 112 - Configure | OK |
| Dec 18 08:44:30 | Dec 18 08:44:30 | grubbox | root@bm | VM 112 - Configure | OK |

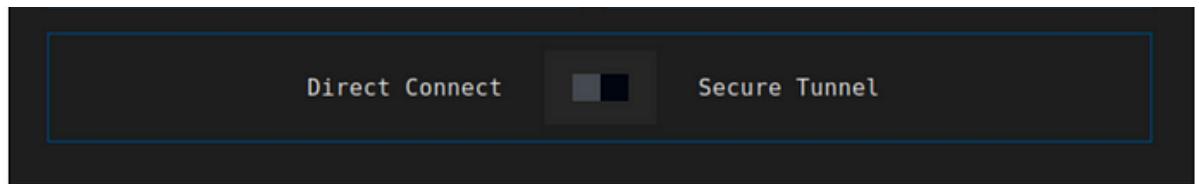
Below the log table, there is a blue button with the text "https://192.168.44.103:32463/?token=ZNS66XH". Further down, there is a text box containing the placeholder "Your scan result will appear here." At the bottom right, there is a yellow button with the text "Please Rate Us".

If you follow this link it will take you to the configuration landing page.

Of note:

If you are on a node that is using a private IP, you may have noticed this switch at the bottom. This is if you are on a different network than the node and are unable to directly connect to it.

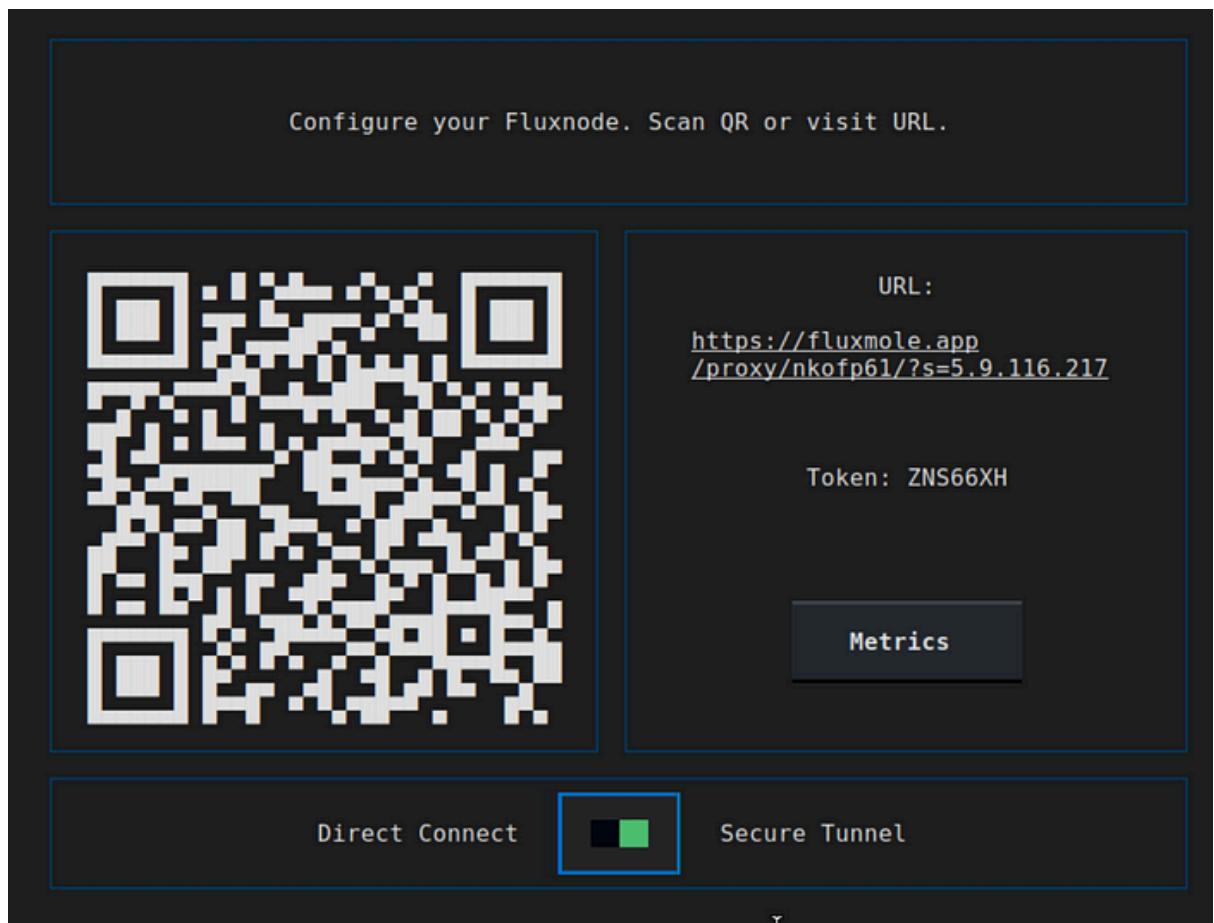
You can enable the secure tunnel. This will proxy an outbound connection via a dedicated flux proxy app that will allow you to connect securely over the internet to complete the configuration.



This will give you a public website address to reach your node.

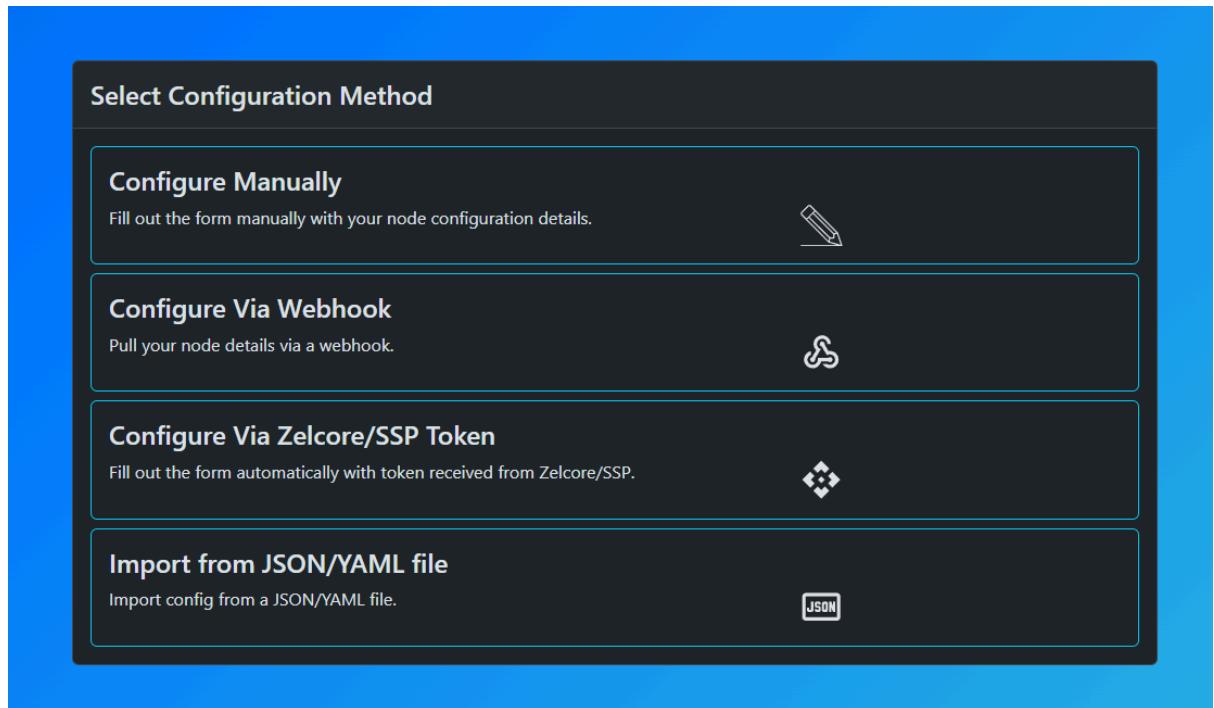
Only enable this if you can't connect via direct connect.

Note: this feature is not available on nodes that have a public IP; As you should always be able to connect via the public address.



Here is the landing page for configuration:

This example is using the secure tunnel, but if using the direct connect (this should be your first choice) The address bar will have the address of your node.

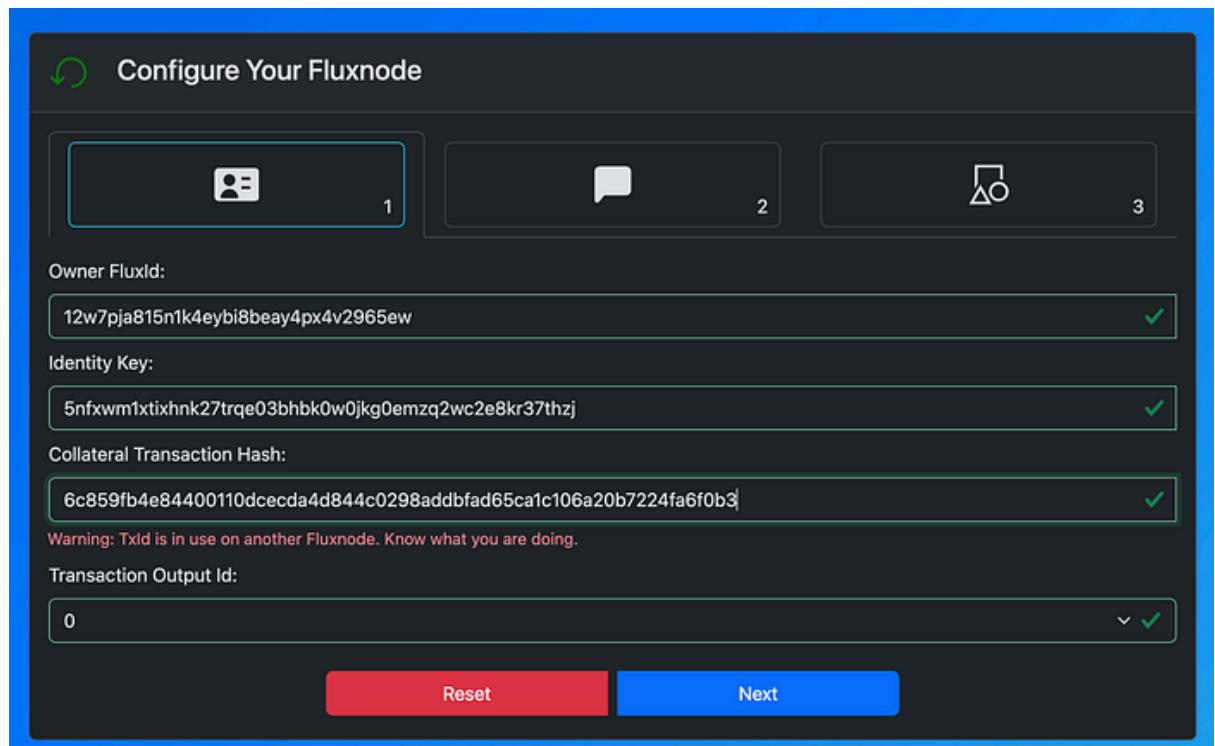


There are several options to complete the configuration of your node. We will cover both the “configure manually” and via the new Zelcore/SSP token.

The wallet token offers a much faster / easier configuration as the technical details are handled behind the scenes.

Configure Manually

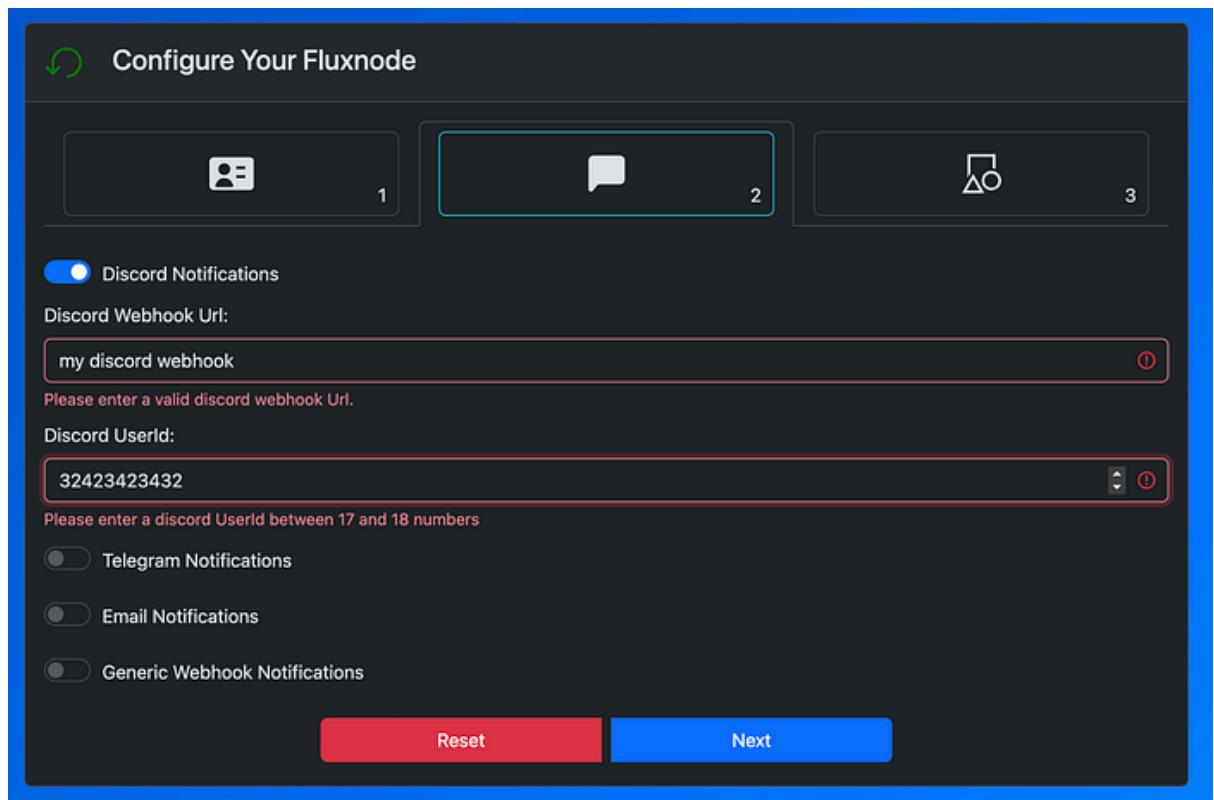
Click Configure Manually, and enter your node details:



You'll notice, when you enter your node's confirmation txid, it will auto populate the output ID for you. You can see for the txid we have entered here, it validates the tx to make sure it isn't in use on another node.

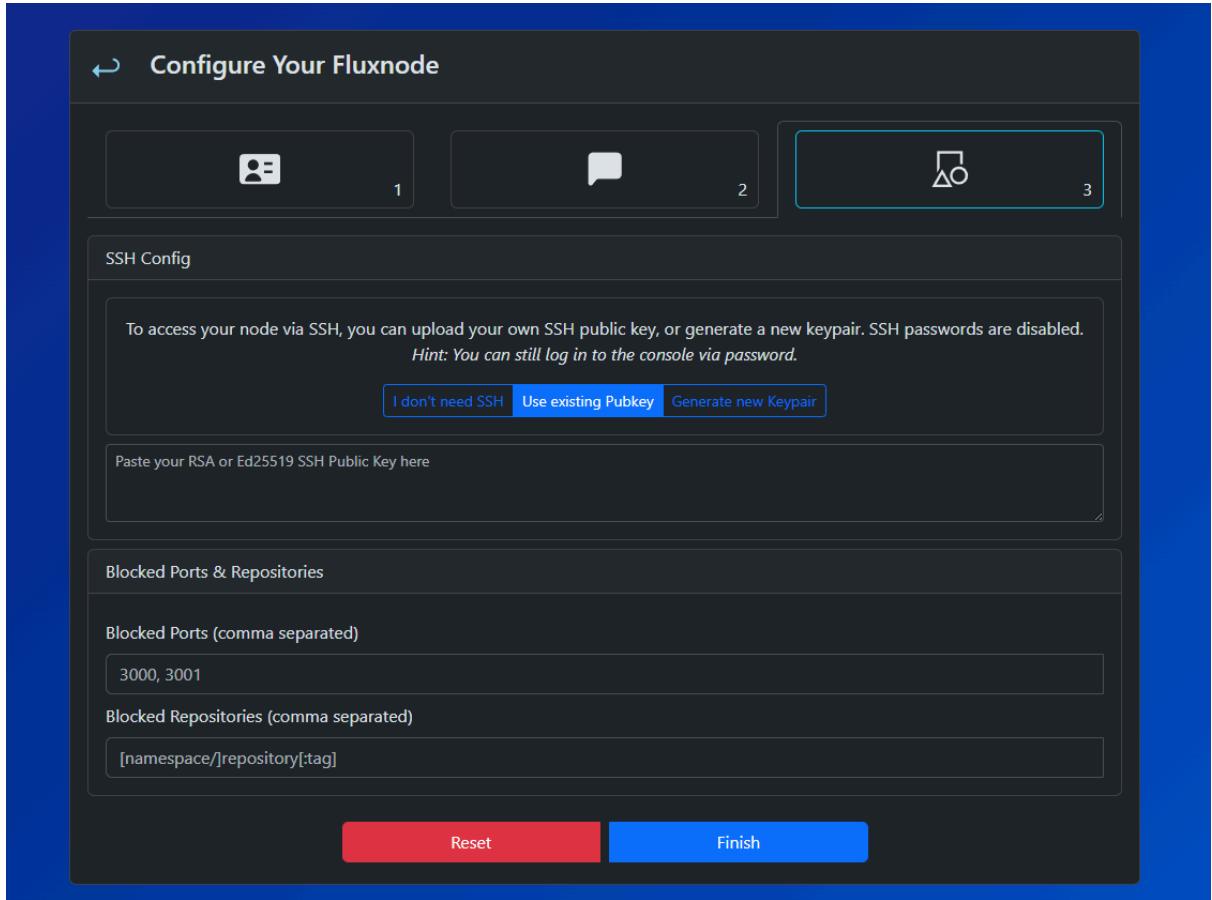
You can still proceed if it is. That's at your own risk.

Click next



Here we can optionally set up an notifications we want. Note, only discord and telegram are activated at this time.

Click next.



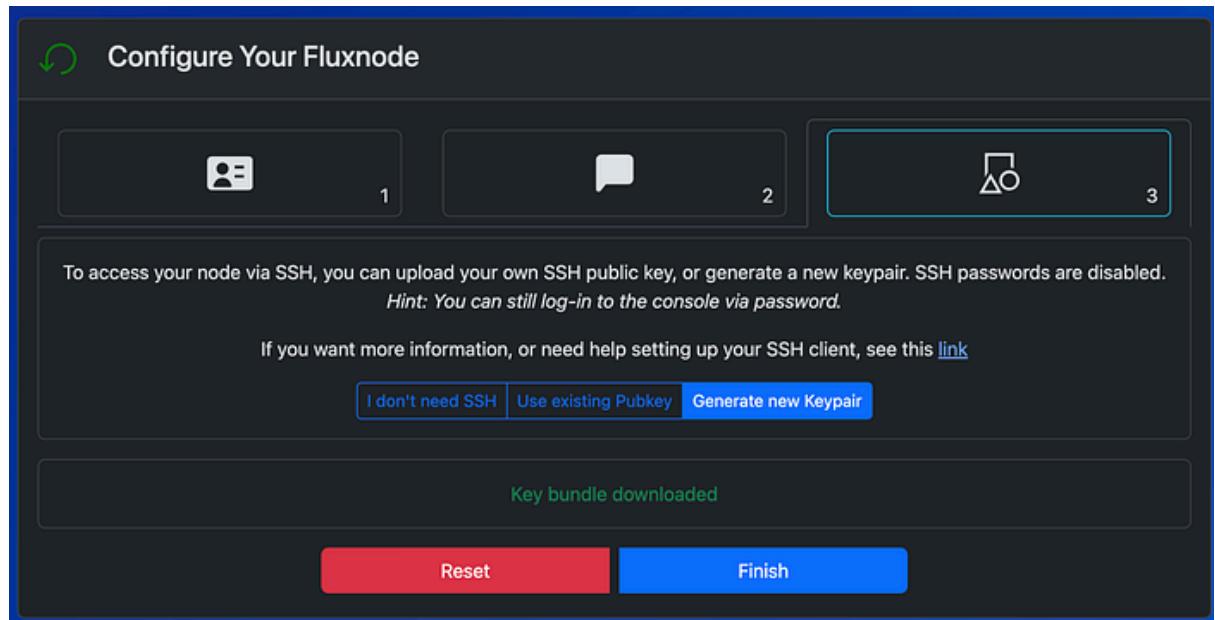
This is where we can set up limited ssh access to the node for maintenance purposes. And you can also define on this page, what ports cannot be used by FluxOS and what know repositories cannot be installed on your node.

There is a user configured called “operator” this has a limited subset of commands that can be run on a node.

If we do want to enable ssh access, we need to either paste in a public key that we have already configured, or click “Generate new Keypair” which will create you an ed25519 keypair, and download the key bundle.

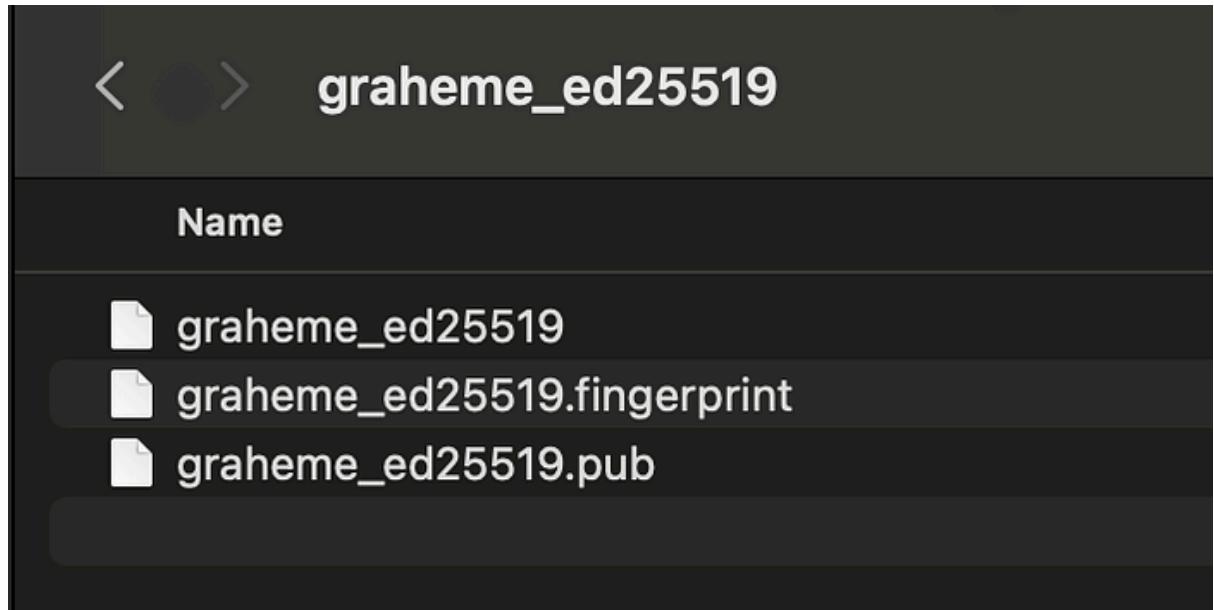
You also have the option of disabling ssh access, by clicking the button on the left.

We are going to generate a keypair.



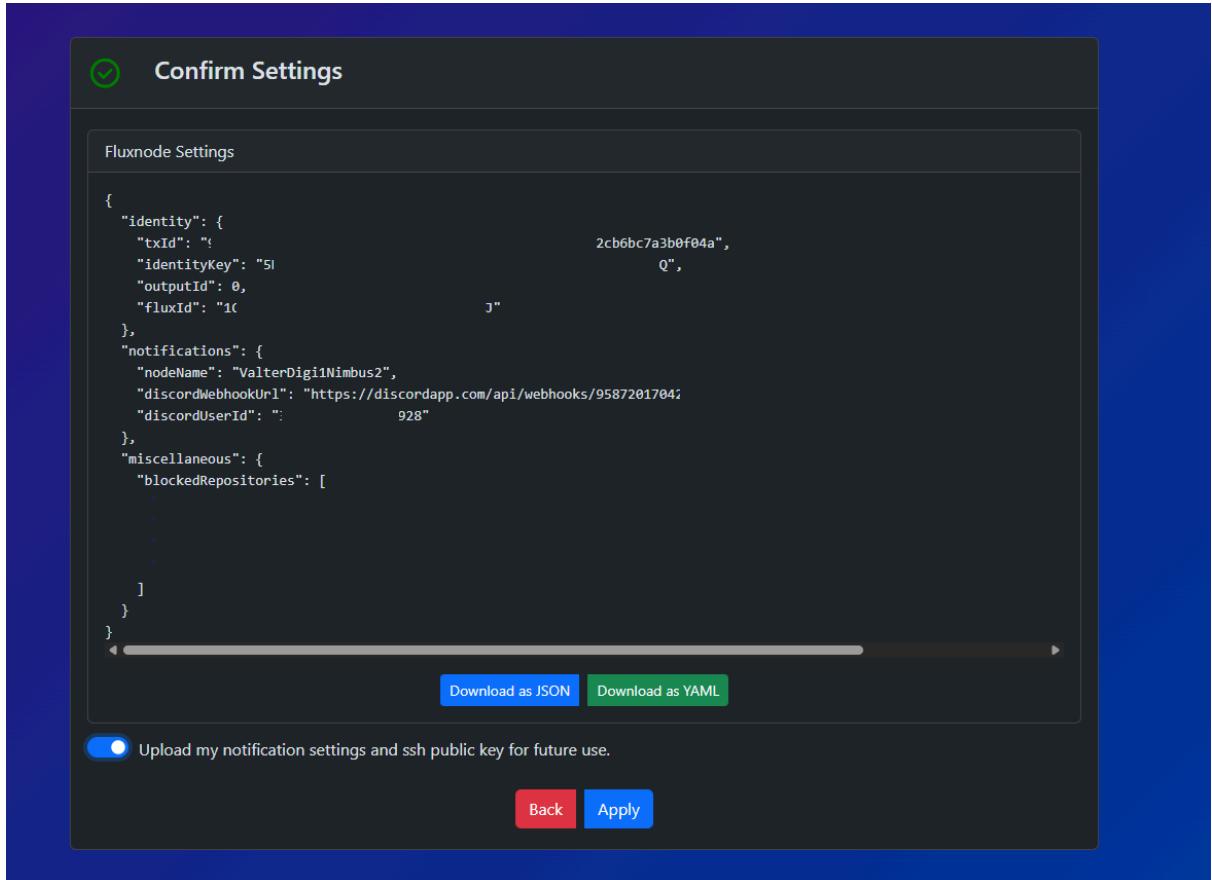
This will automatically download the key bundle. With the name that we chose for a hostname in the installer.

Here is the bundle unzipped



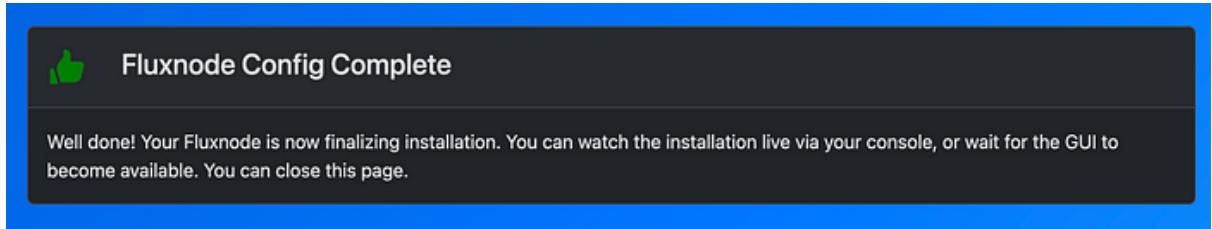
To ssh to your node, you would need to use this private key file. Once set up, this is much more secure, and faster, than using a password.

Click finish — this will bring up a confirmation page.



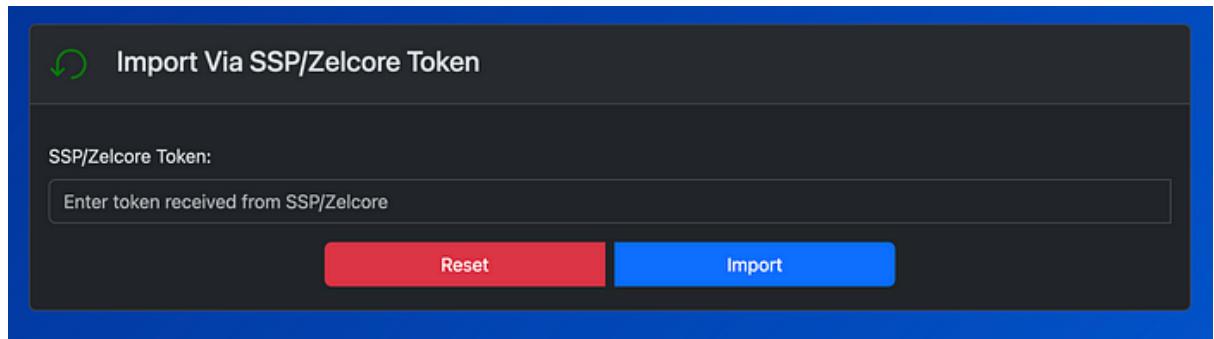
Toggle on to upload your notifications, ssh, ports and repos settings for future use on new nodes install.

Click apply – this will bring up a final config complete page.
You can close this webpage now.



Configure automatically with Zelcore/SSP token.

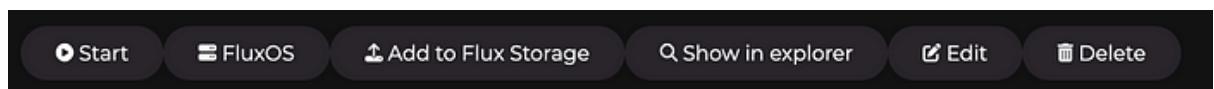
Zelcore: Click “Configure via Zelcore/SSP Token” This will bring up the following form:



Now, we need to open Zelcore or SSP and get the configuration token.

For this example, we’re using Zelcore.

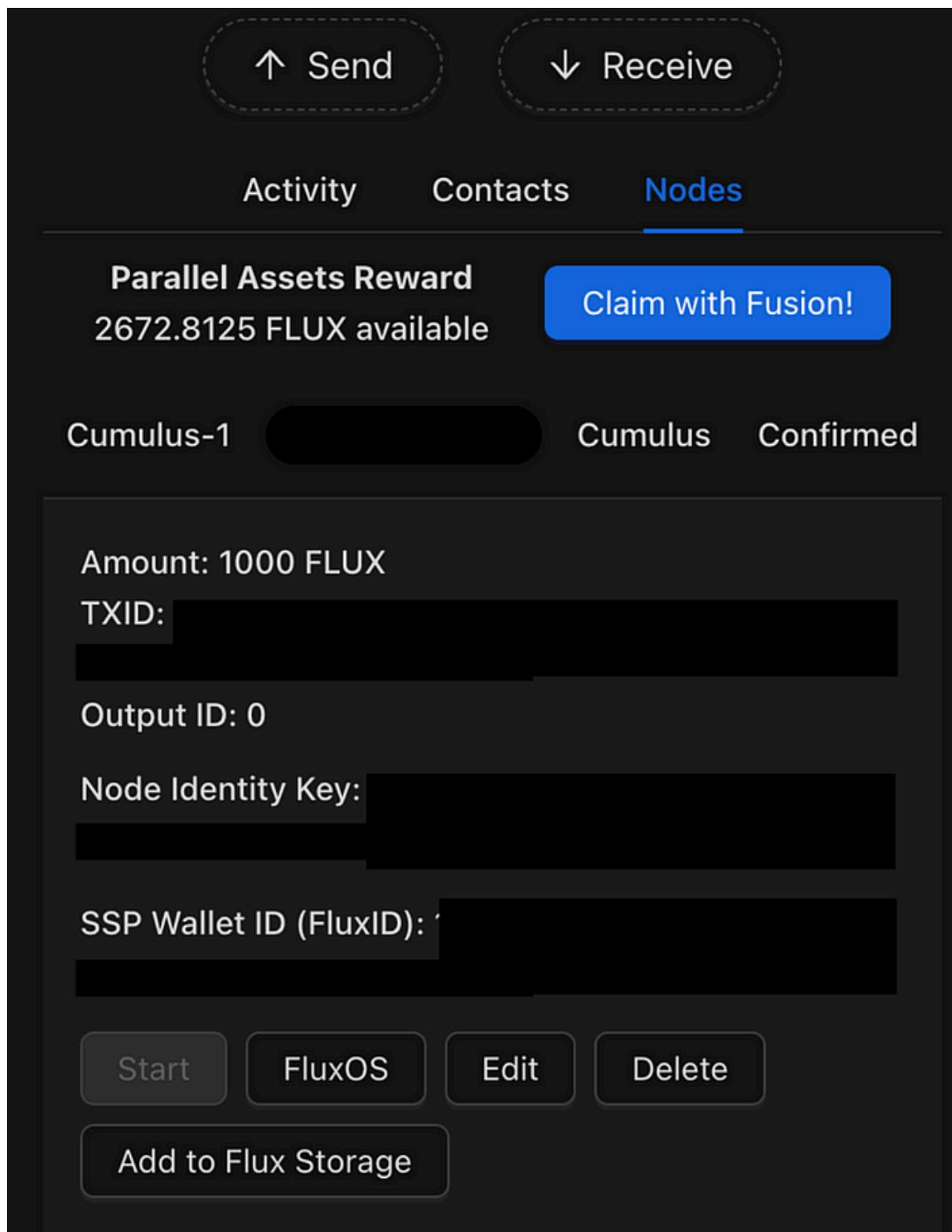
Navigate to your FluxNodes, and highlight the node you want to configure.



You will see an option, “Add to Flux Storage’ click it. This will show a two word key, copy this.



SSP: Click “Add to Flux” storage from the Nodes tab



This will bring up an information dialog, click “Add to Flux storage”

② Add to Flux Storage

This action will upload your configured Flux Node to Flux Storage. This is used to simplify the setup of your FluxOS. You will be presented with storage identifier to use for your FluxOS setup.

Cancel

Add to Flux Storage

Add to Flux Storage

Copy the storage phrase

Storage Phrase



Your Flux Node is available in Flux Storage, you can now use it in your FluxOS setup.

Copy the Flux Storage Phrase and use it in your FluxOS setup.

identical-kite

OK

Paste the phrase / key into the configuration page and click import.

Import Via SSP/Zelcore Token

SSP/Zelcore Token:

Reset Import

This will automatically populate all the fields for your node. If you have also set notification settings before, it will prepopulate those also.

You can then continue the same as setting up your node manually.

Watch the install complete

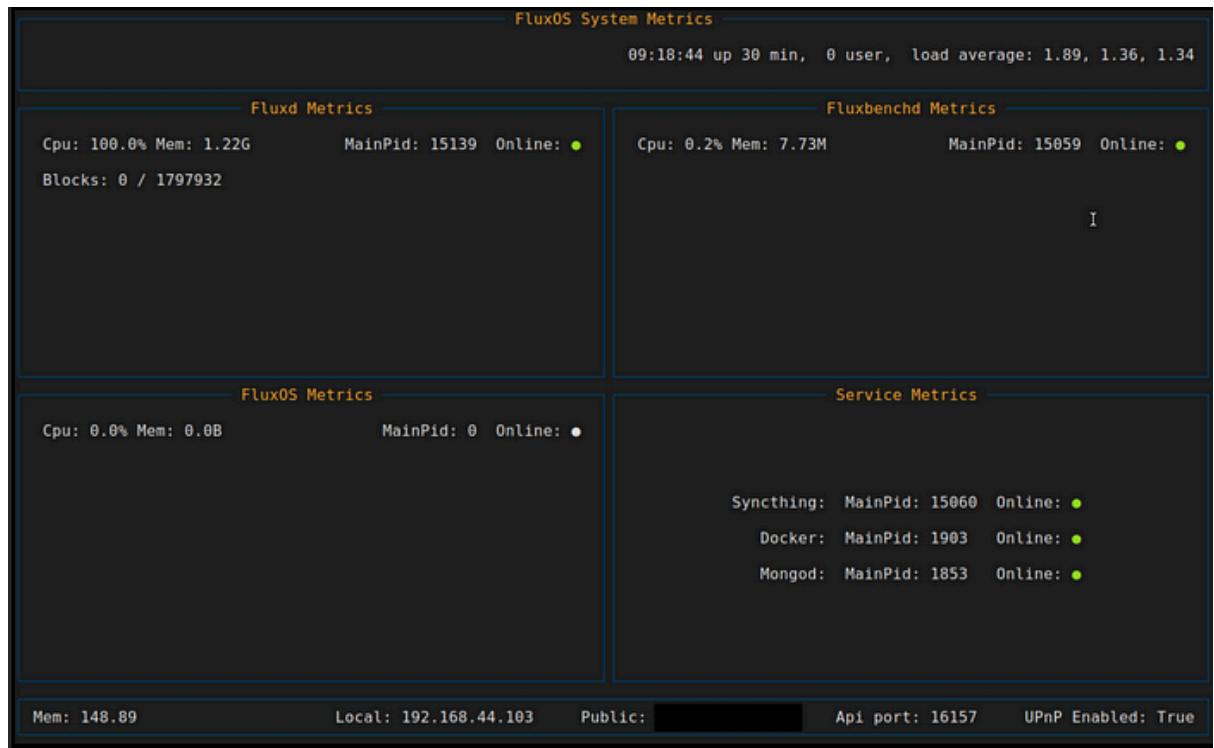
At this point, it is assumed that you have finished the user configuration steps above.

If you go back to the console screen for your node, you will see the main metrics dashboard. Which gives you an overview of your node.

If you are running multiple nodes under the same private ip, the Arcane OS install will check if there is any available with daemon synced and inside maintenance window, if yes, it will

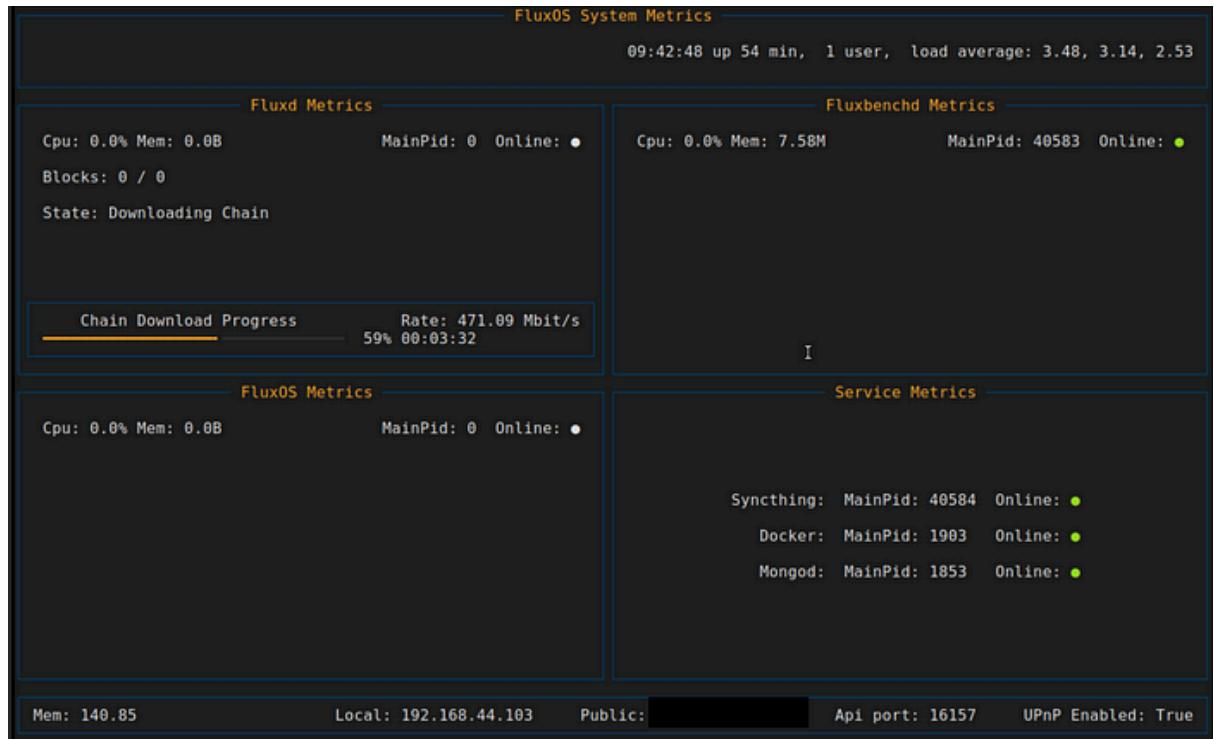
download the Flux chain from that node instead of using CDN bootstrap.

Note: this dashboard will change with more information in the future.



The metrics on this page will vary depending on the amount of time it takes to download the chain, and how long it took to enter the configuration settings.

Above the chain has already been downloaded and fluxd is just starting up.



Above the configuration has been completed (you can tell as syncthing and fluxbenchd are running) but the chain is still downloading.

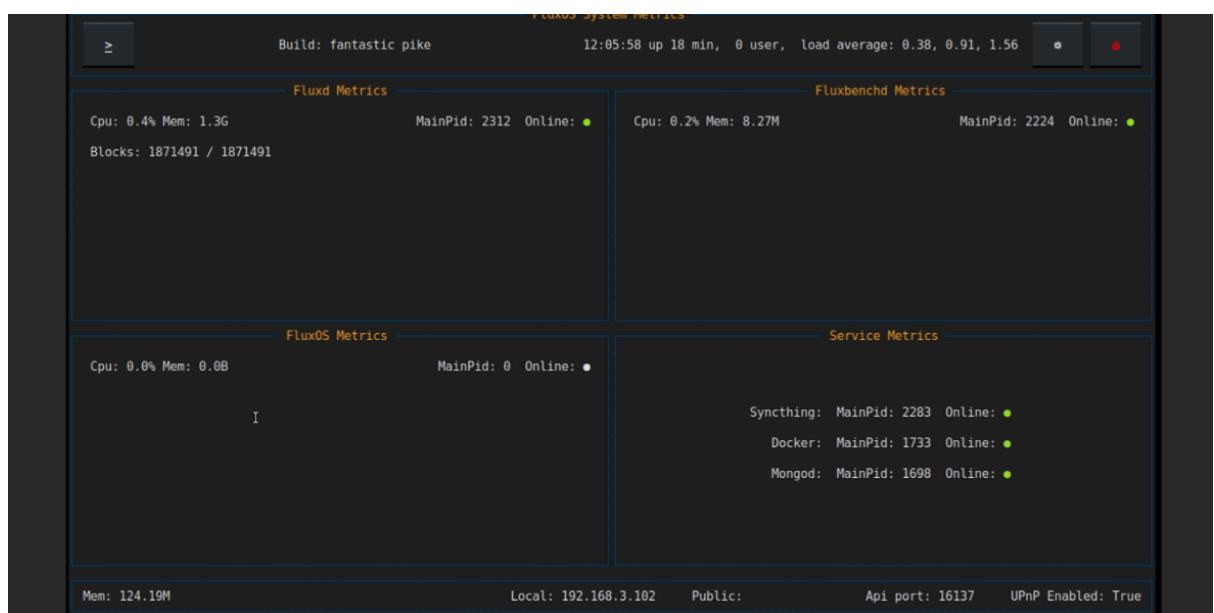
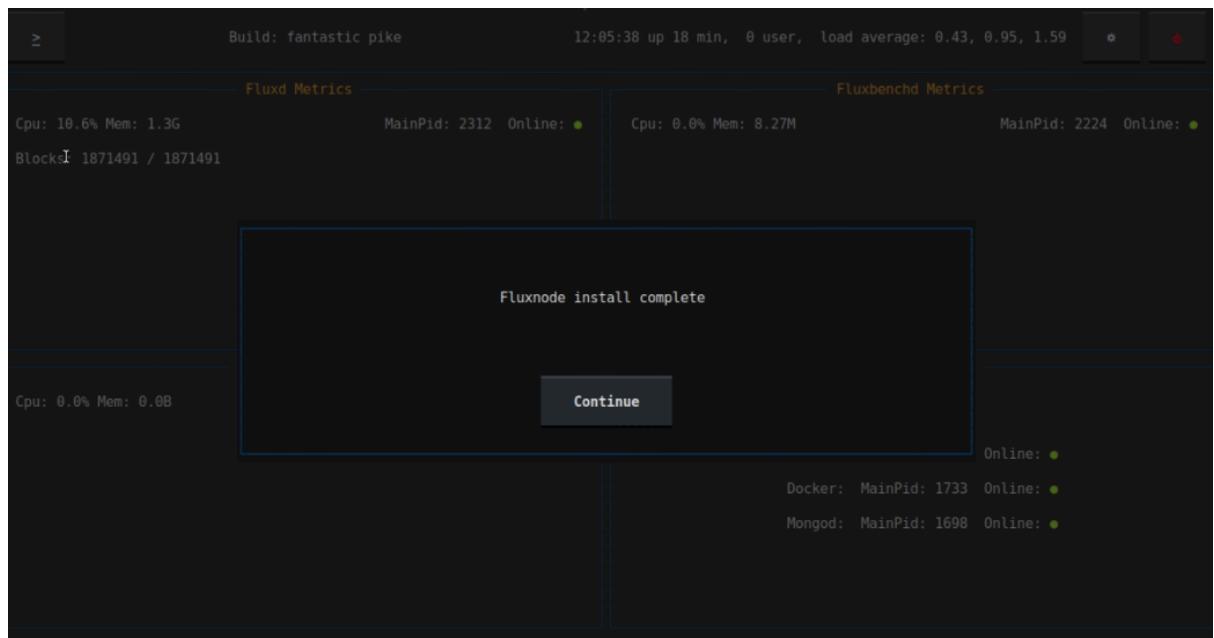
FluxOS will wait for fluxd to come online, then will bring itself online. You may notice fluxd / fluxos restart during this time.

At this point, the installation will complete on its own. You can tell when the installation is complete, as a “shell” button will become available in the top left corner.

After FluxOS is started, flux-watchdog and flux-update services are also started. This can take a few minutes.

Note: Again, this dashboard is under active development, and changes will be made to make it much easier to identify when the installation is complete, and provide more detailed user information about the state of the node.

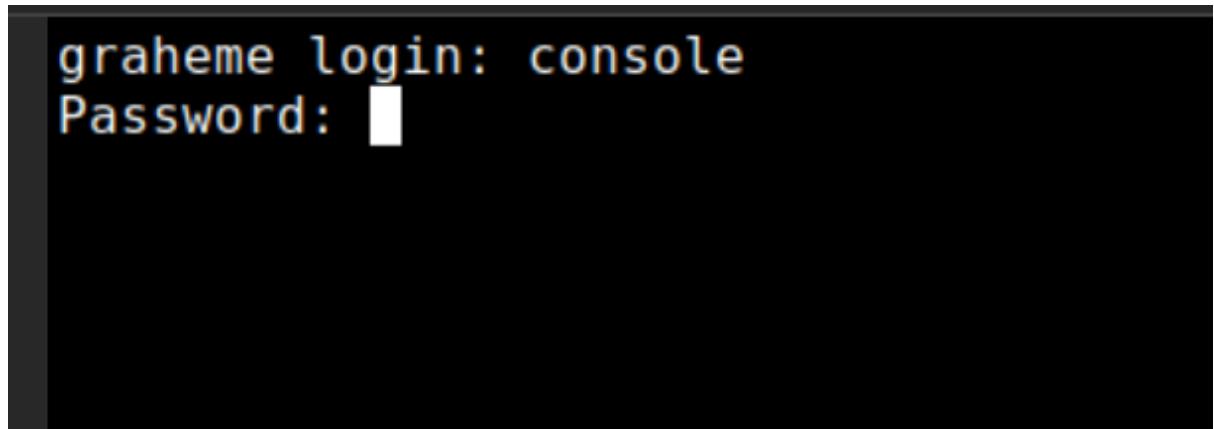
Here is the view when the installation is complete:



If you click on the shell button (top left), you can use the following login:

user: console

password: the console password you set during installation.



At this time, you are also able to ssh in via the operator user with your private key. (If you enabled ssh)

```
Nimbus2 login: console
Password:
Welcome to Ubuntu 24.10 (GNU/Linux 6.11.0-21-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

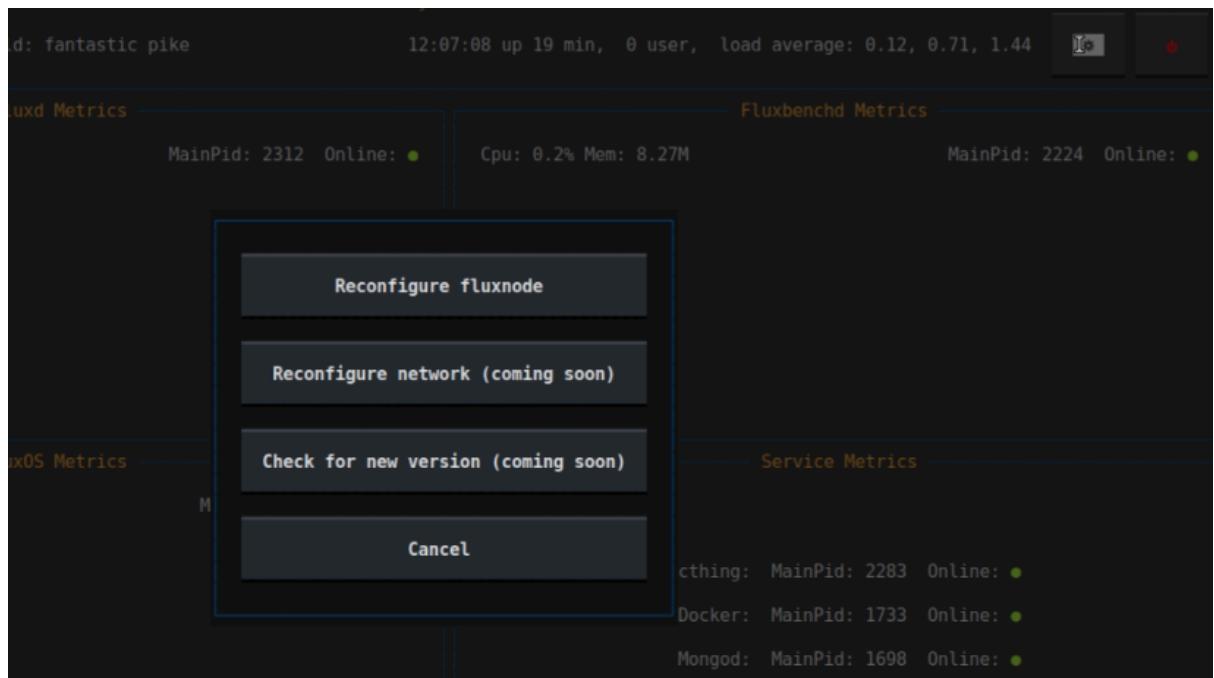
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

Available commands

help      This command.
shutdown  Shuts the system down.
reboot    Reboot the system.
flux-cli   The fluxd cli.
fluxbench-cli The fluxbench cli.
multitoolbox The fluxnode multitool.
upnpctl   Manage upnp ports.
ping      Ping hosts.
systemctl  Monitor services (view only).
pwd       Show your current directory.
lsblk     List block devices.
df        File System space usage.
clear_console Clean the screen.
exit      Exit the shell.
```

It's displayed after the login the list of commands allowed to be executed.

On the top right of the console page you have the power button and setting button.



If you press Reconfigure FluxNode you will enter in setup mode, where you can reconfigure your node information, this setting, stops everything running on the FluxNode other than the daemon syncing, until you configure your node again.