

NAS



Old NAS

- pfSense + NAS
- Limited speed 30MB/s
- firewall + NAS is a bad idea
- pfSense upgrades stopped NAS working

First attempt

Hardware NOT USED

Product	Seeed Dual SATA HAT from Digikey
Make	RockPI
Revision	1.2
Specs	datasheet.pdf
Power	12V DC 3A 5.5x2.1mm
CHIP	JMS561 USB3.0 to Dual SATA Gen3

Problems

- Not a real SATA interface (USB to SATA)
- OpenMediaVault doesn't work with USB to SATA
- Unreliable
- No Case

Requirements of NAS

Requirements

- Open Source OS
- SBC
- Low power
- Case included
- Low noise fan
- SATA/PCI interface, ie: NOT USB interface
- Faster than 30MB/s
- Upgradable

Use cases

- Always on large storage
- Storing backups

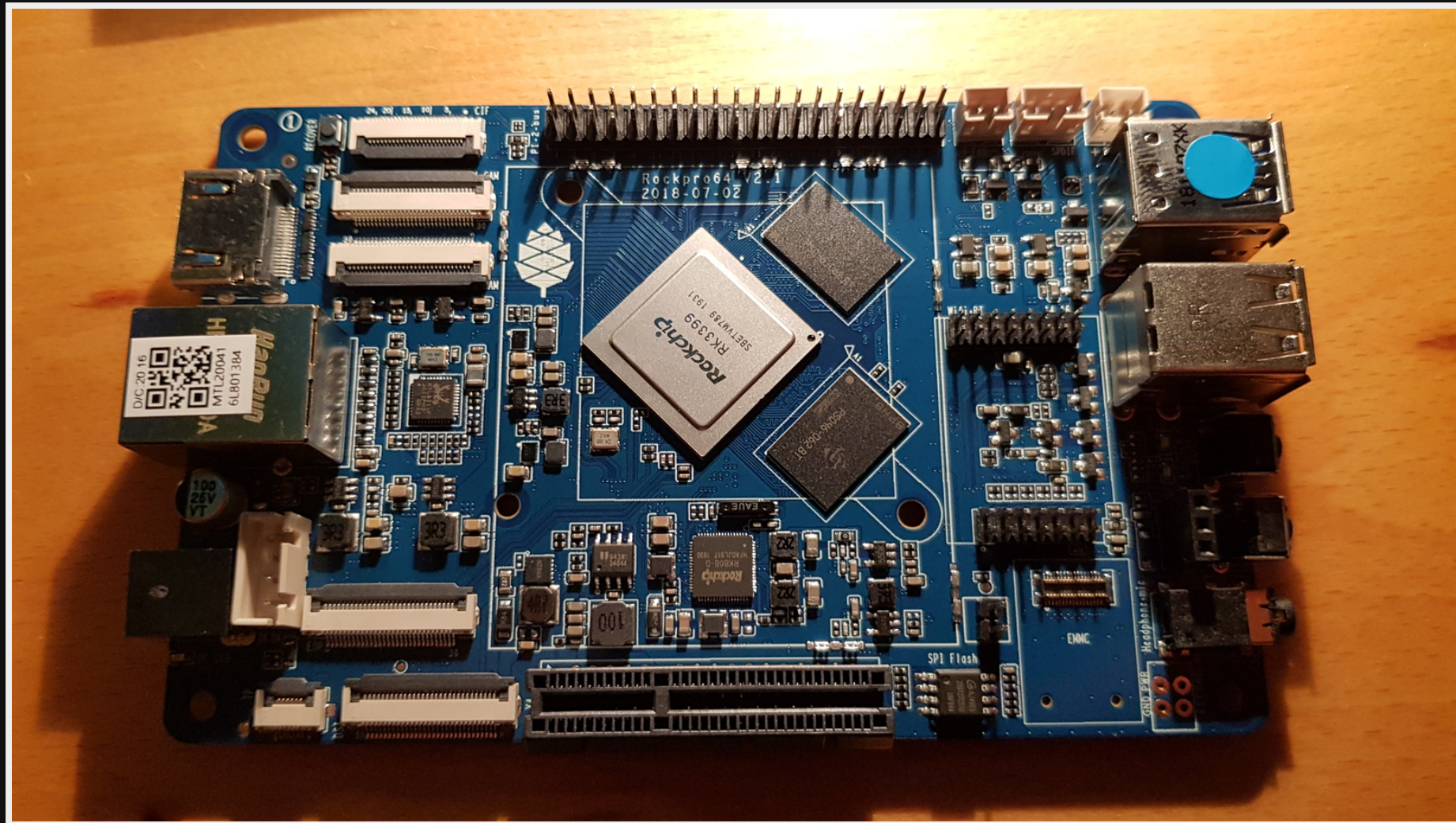
Hardware \$512

Sandisk Endurance 64GB	mwave	19
12V 3A Power Adapter 2.1mm	Altronics	28
ROCKPro64 Metal Casing	Pine64	58
ROCKPro64 4GB + 30mm HS	Pine64	108
PCI-e Dual SATA-II	Pine64	13
16GB eMMC Module	Pine64	21
Fan for ROCKPro64 case	Pine64	5
2 x WD 2TB SATA 2.5in	mwave	260

Box



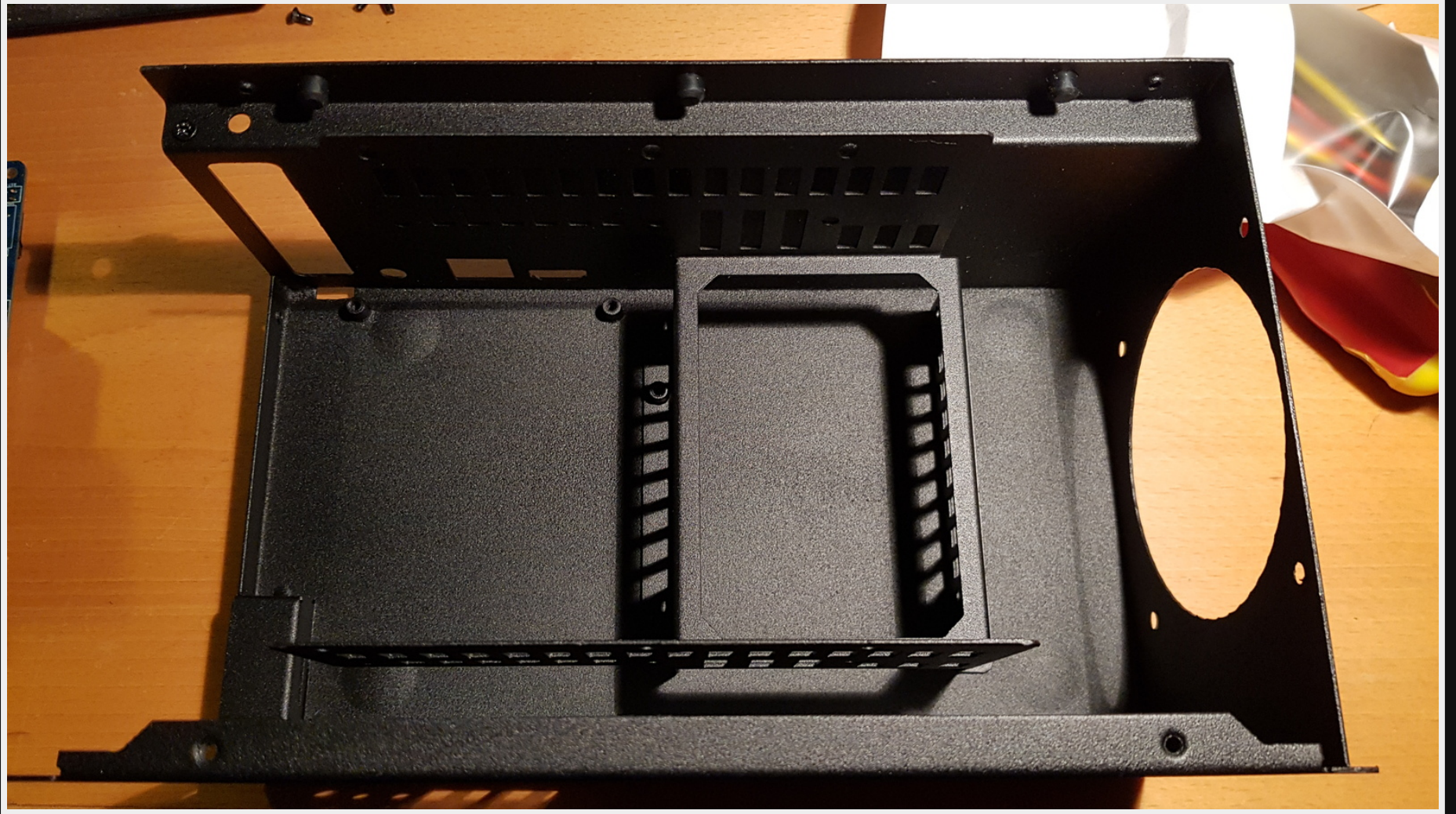
RockPro64



Parts overview



Inside

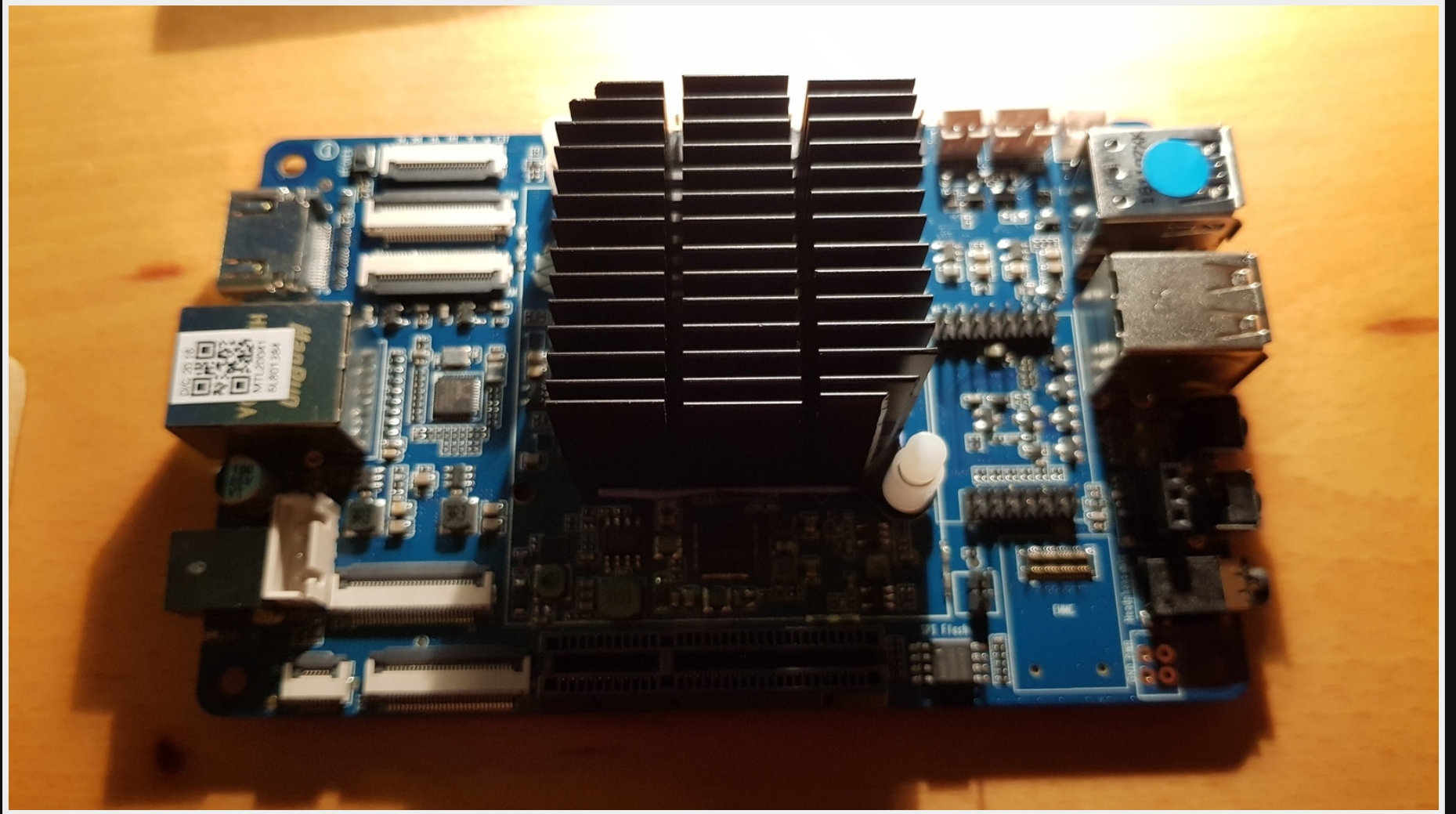


Cables



Assembly

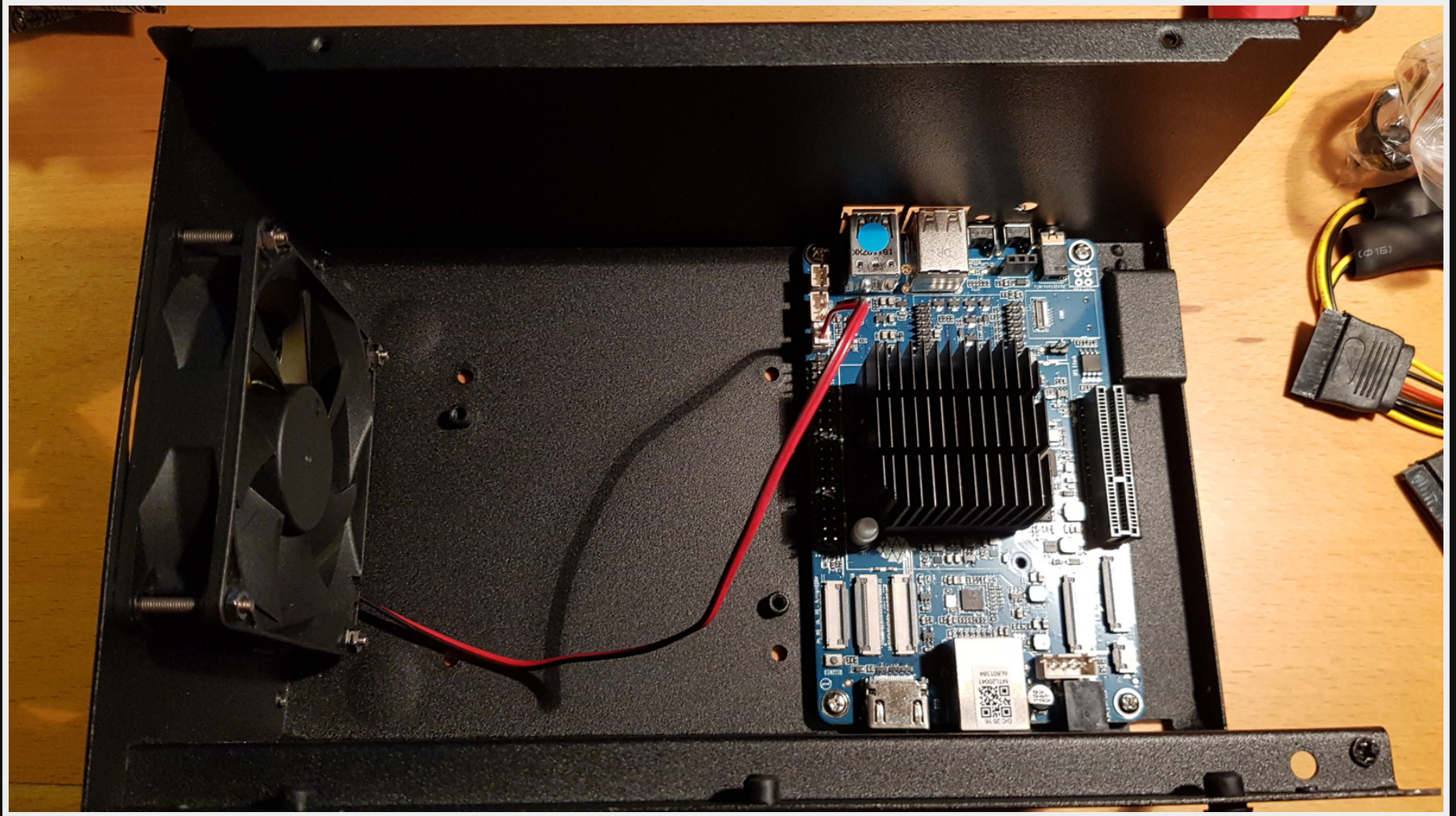
RockPro64 with Heatsink



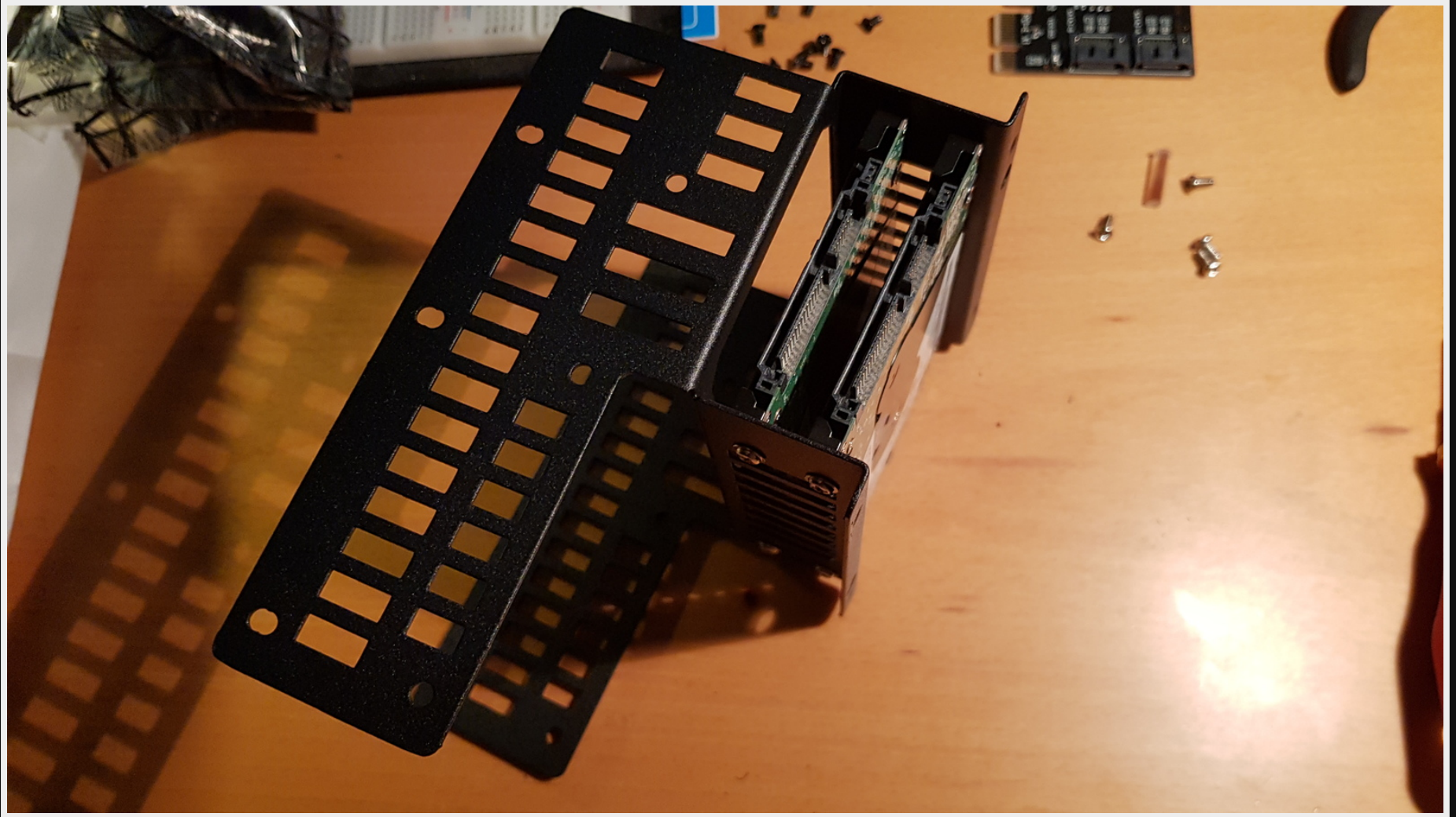
Mounting board



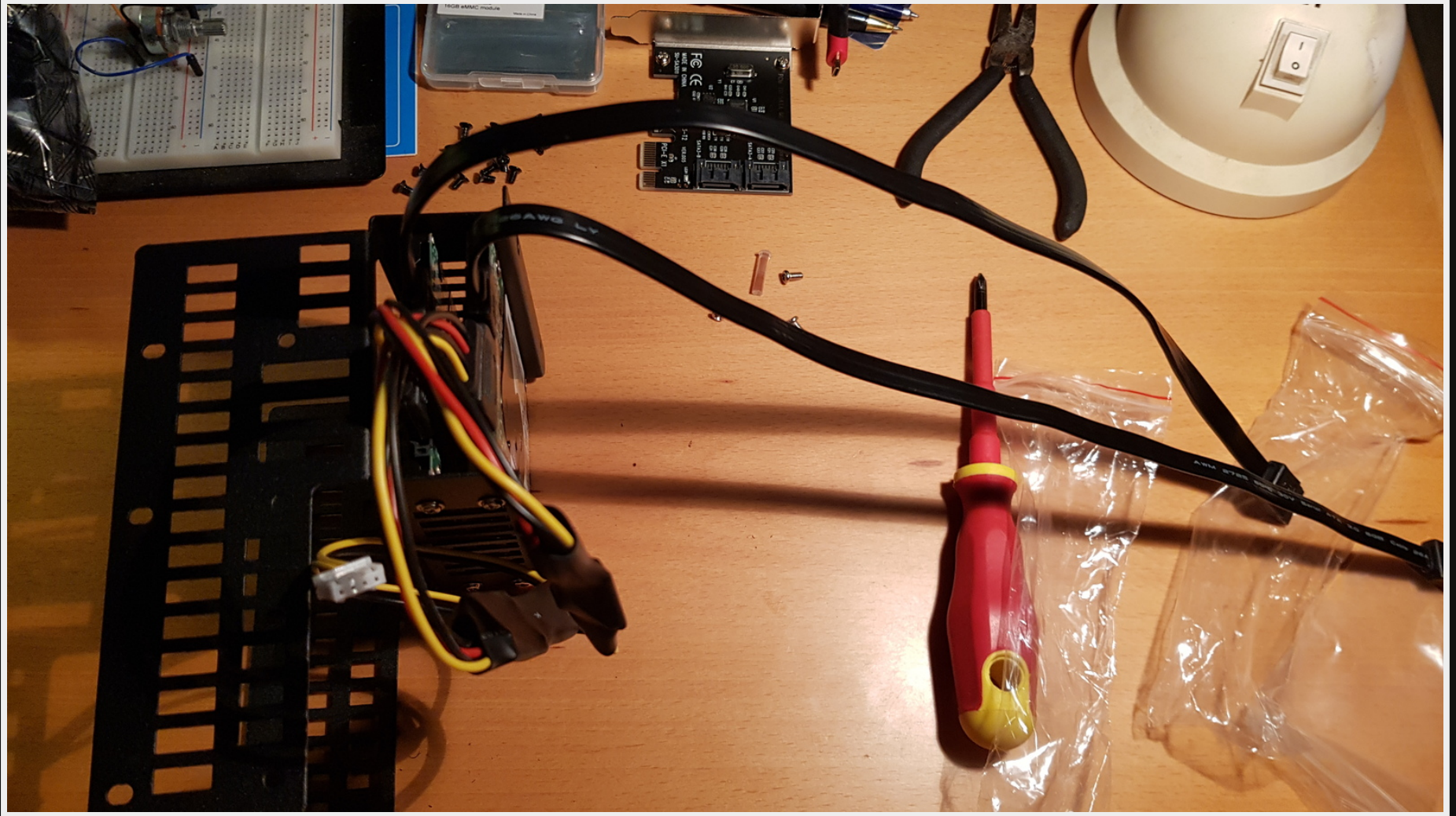
Fitting the fan



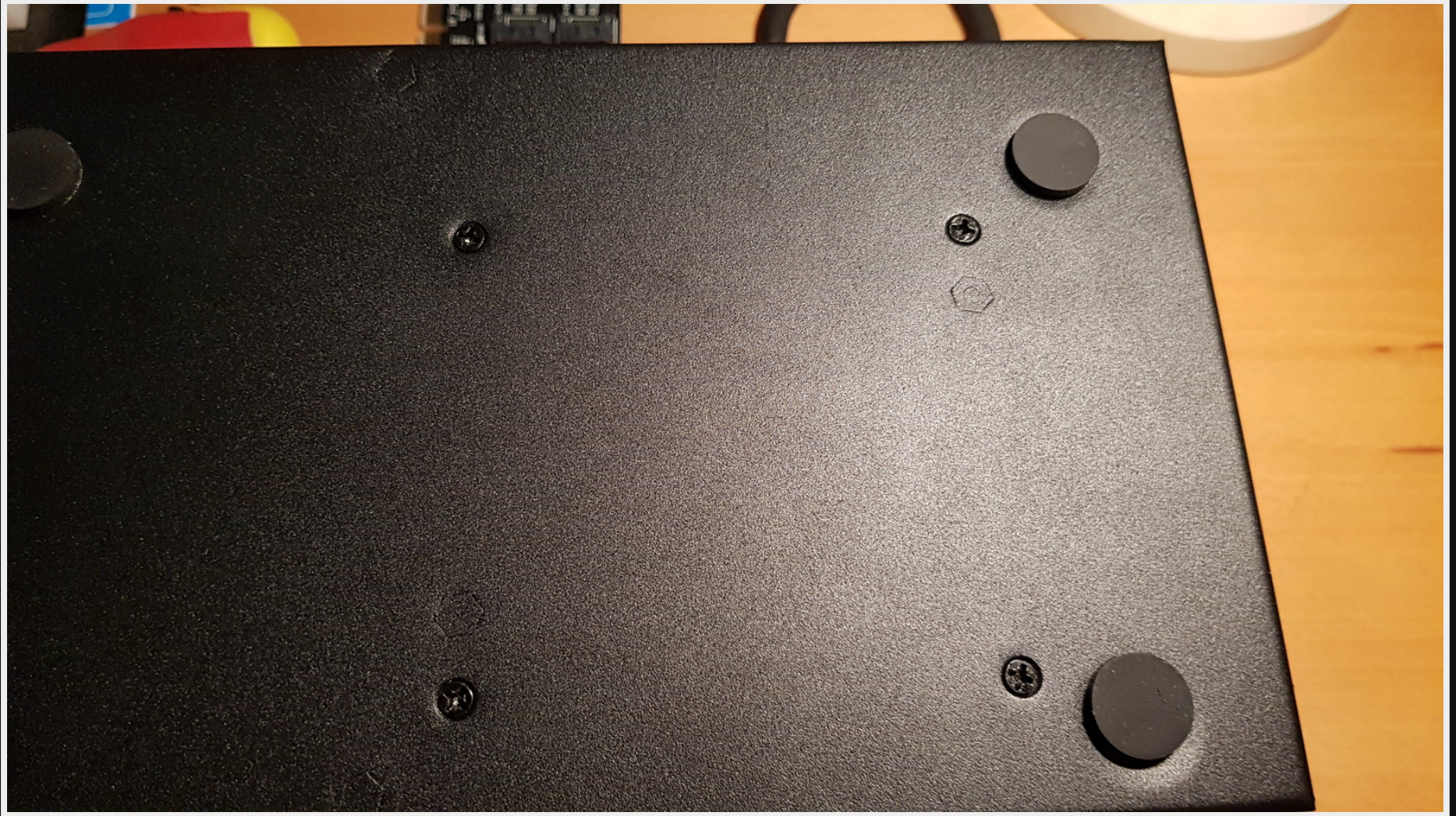
Installing HDs



Attaching power & SATA



Attach drive assembly



Top view



Installing OS

Download Armbian

- Download Armbian: <https://www.armbian.com/rockpro64/Buster/>
[https://redirect.armbian.com/rockpro64/Buster_](https://redirect.armbian.com/rockpro64/Buster/~Downloads/Armbian_20.11.3_Rockpro64_buster_legacy_4.4.213.img)
[~/Downloads/Armbian_20.11.3_Rockpro64_buster_legacy_4.4.213.img](https://redirect.armbian.com/rockpro64/Buster/~Downloads/Armbian_20.11.3_Rockpro64_buster_legacy_4.4.213.img)

Important to use Debian Buster, not Ubuntu due to
FAN control module


Flash


- Flash to SD Card using etcher

Etcher



 Flash from file

 Flash from URL

 Clone drive

(LIBREELEC, STORAGE)

[Change](#)

63.9 GB

Flash!

Install

- Setup users
- DHCP for network (Set static at pfsense end)

Config FAN

<https://github.com/tuxd3v/ats>

```
sudo apt install lua5.3 lua5.3-dev luarocks gcc make  
sudo luarocks build https://raw.githubusercontent.com/tuxd3v/ats/master
```

Restart ATS

```
service ats restart
```

Installing OpenMediaVault (OMV)

Install OMV

armbian-config

Software -> Softy -> OMV

Change Password

1. Login to terminal

2. Run

```
sudo omv-firstaid
```

3. Select '3 - Change control panel administrator password'

Login OMV

My internal URL	https://10.1.1.9
-----------------	---

user	admin
------	-------

pass	<my password>
------	---------------

Config OMV

Create Mirror RAID = 4hrs

- Ref: [How To Set Up A Hard Drive RAID In Open Media Vault - YouTube](#)
- Other RAIDs offered are
0,1,5,6,10,linear(simple group of disks)

I configured a "Mirror RAID" on two 2TB HDs

```
Storage -> RAID  
Select all drives  
Select Mirror  
Click 'create'  
Click 'ok' to the dialog  
Click 'Apply' & 'YES'
```

Add filesystem

Create file system on top of RAID (waiting till RAID has initialized)

1. Storage -> File systems

2. Click 'Create'

Device	RAID nas:data
Label	data
File system	ext4

3. Click 'Ok', 'Yes'

4. Click 'Mount'

Share via Samba

1. Share through SAMBA
2. Services -> SMB/CIFS
3. Click "Enable" -> "Shares Tab" -> "Add"
4. Add share settings

Enable	true
Shared folder	<Add>
Recycle bin	True

Share via Samba Part 2

1. Add shared folder settings

Name	data
Device	data
Path	data/
Permissions	Everyone

2. Click "save" twice and "apply"

Performance

Getting about 70MB/s

Demo

- In a file manager on another machine go to
`smb://nas.local`
- Try and write a file
- Copy `~/backup/mlugwebsite.7z` to
`smb://nas.local/data/`

Enable SMART

For HD monitoring enable SMART

1. Storage -> SMART
2. Click "Enable"
3. Click "Devices" tab and edit each device to enable monitoring
4. Add a short test schedule to each device.
5. Apply

References

- LXF252 'Manage your storage'
- LXF207 'OMV: Build a low power NAS' using a PI

Questions

Email	map7777@gmail.com
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Twitter	@map7
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Github	github: map7
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