

# INSTALL ARCH LINUX ARM WITH XFCE

## The Hardware



At the top, two possibilities for the DATA partition drive which will store all your files. A USB-3 SSD external housing with a SSD of your choice and size. In this case a Samsung 850 500GB SSD. OR if more storage is needed, a USB-3 3.5 inch external hard drive enclosure, in this case with a 2 TB WD Red Label hard drive. Next is a 5 VDC 6 Amp power brick for the Odroid-XU4, not shown is a 12 VDC power supply included with the 3.5 inch hard drive if used. At the bottom, a USB SD Reader. A micro SD to SD adapter. A micro SD card OR an emmc to micro SD adapter with an emmc card for the Operating System. Then the Odroid-XU4 SBC (Single Board Computer). With optional Real Time Clock battery, 40 mm cooling fan, and a 1/4 inch plywood base with stand offs to protect the components on the bottom.

Of course, any ARM device that Arch Linux Arm supports can be used, such as a Raspberry PI 4 or the new Odroid N2 with 4 GB RAM, or what ever. Just go to the Arch Linux Arm site, <https://archlinuxarm.org/> Hover over "Platforms" then the Architecture, brand name, etc. to see if your device is supported. Click on your device and get a page with overview and installation tabs.

The storage device for the Operating System will be either a Micro SD card or an emmc card. The storage device for the DATA partition will be by necessity a SSD or Hard Drive in an USB 3 enclosure as pictured above. A third storage device will be necessary for doing backups of the DATA partition, also in a USB 3 enclosure. It would ideally be the same as the DATA device as far as manufacturer, model, and especially the size in Gigabytes or Terabytes.

Flash the micro SD card with the OS and bootloader.

The micro SD card must be at least 32GB, 64 GB gives more head room for logs and etc. Use a good name brand micro SD such as Samsung or SanDisk ultra, not an off brand. SD cards come in different speed classes, 2, 4, 6, and 10, with 10 being the fastest. Since the advent of 4k devices, there is also UHS class speed 1 and UHS class speed 3. UHS = Ultra High Speed. Get at least a class 10 HC1 device. Here is what I have



The speed class is the number 10 inside what looks like a C. The speed class is followed by A1 which is a new specification I am not familiar with. The UHS speed is the number 1 inside a U and also referred to as HC1. This one sold for \$8.98 USD at amazon including a Micro SD to SD adapter.

On a working x86\_64 computer, insert the latest USB EndeavourOS ISO installer. Use the USB EndeavourOS ISO because it includes GParted, and cleaning up directories and files created during the flash process is not necessary. The ISO is not persistent, so after a reboot, it's all gone.

Boot into the msdos/MBR version of the EndeavourOS installer ISO.

Insert the USB SD READER containing the Micro SD to SD adapter with the micro SD card. In the Endeavour welcome screen, select Partition Manager (Gparted)

## INSTALL Base ARCH LINUX ARM on an ODROID XU4

Click on "GParted" tab and select the USB SD READER (ensure the right device is selected)  
Note the Device Name of the SD READER, such as /dev/sda. Write this down.

Click on "Device" tab, and create a msdos Partition Table.

If an existing partition is mounted, this will fail. Highlight the partition with the key symbol, right click on it, select "unmount" Then repeat with the "Device" tab and create a msdos Partition Table.

Click on "Partition" tab, then new

Free Space preceding MiB: 2	Create as: Primary Partition
New Size MiB: leave as is	Partition name:
Free Space following (MiB): 0	File System: ext4
Align to: MiB	Label: Odroid-XU4

Apply All Operations

Close GParted

Close the Welcome screen

Open a terminal window.

```
$ mkdir Odroid
$ cd Odroid          (isolates the process from the rest of the OS)
$ sudo su
# mkdir MP           (MP = temporary Mount Point for the USB SD Reader)
# mount /dev/sdX1 MP (change /dev/sdX1 as noted in Gparted, e.g. /dev/sda1)
# wget http://os.archlinuxarm.org/os/ArchLinuxARM-odroid-xu3-latest.tar.gz
# bsdtar -xpf ArchLinuxARM-odroid-xu3-latest.tar.gz -C MP
# cd MP/boot
# sh sd_fusing.sh /dev/sdX (change /dev/sdX to what's appropriate. e.g. /dev/sda)
# cd ../../
# umount MP         (this could take a while)
# exit
$ exit
```

The Arch Linux ARM Operating System is now installed.

NOTE: To install OS on an emmc card, see "Flash an emmc card" at the end of this tutorial.

Shut down the x86\_64 computer, and remove the uSD card from the USB SD Reader.

Set the boot switch selector on the Odroid-XU4 board, next to the HDMI jack, to the uSD position (to the left).

Insert the micro SD card into the XU4. Connect a monitor, keyboard, ethernet, & apply 5VDC

## INSTALL Base ARCH LINUX ARM on an ODROID N2

Click on "GParted" tab and select the USB SD READER (ensure the right device is selected)  
Note the Device Name of the SD READER, such as /dev/sda. Write this down.

Unmount any mounted partitions as indicated by a key symbol. Highlight the partition with the key symbol, right click on it, select "unmount"

Click on "Device" tab, and create a msdos Partition Table.

Click on "Partition" tab, then new

Free Space preceding MiB: 2	Create as: Primary Partition
New Size MiB: 256	Partition name:
Free Space following (MiB): XXXX	File System: fat32
Align to: MiB	Label: BOOT

Create a second partition

Free Space preceding MiB: 0	Create as: Primary Partition
New Size MiB: XXXXXX	Partition name:
Free Space following (MiB): 0	File System: ext4
Align to: MiB	Label: ROOT

Apply All Operations

Close GParted

Close the Welcome screen

Open a terminal window.

```
$ mkdir OdroidN2
$ cd Odroid          (isolates the process from the rest of the OS)
$ sudo su
# mkdir MPboot      (MP = temporary Mount Point for the USB SD Reader)
# mount /dev/sdX1 MPboot (change /dev/sdX1 as noted in Gparted, e.g. /dev/sda1)
# mkdir Mproot
# mount /dev/sdX2 MProot
# wget http://os.archlinuxarm.org/os/ArchLinuxARM-odroid-n2-latest.tar.gz
# bsdtar -xpf ArchLinuxARM-odroid-n2-latest.tar.gz -C MProot
# mv MProot/boot/* MPboot
# dd if=MPboot/u-boot.bin of=/dev/sdX conv=fsync,notrunc bs=512 seek=1
# vi or nano MPboot/boot.ini (this is optional to set screen resolution)
    copy desired resolution into the hdmimode variable
    setenv monitor_onoff "true" (close file)
    eMMC Edit MProot/etc/fstab change boot partition to /dev/mmcbk0p1
# umount MProot MPboot
# exit
$ exit
```

The Arch Linux ARM Operating System is now installed.

Shut down the x86\_64 computer, and remove the uSD card from the USB SD Reader.

Set the boot switch selector on the Odroid N2 board to MMC

Insert the micro SD card into the N2. Connect a monitor, keyboard, ethernet, & apply 5VDC

## Install EndeavourOS on ARM

The following SHOULD work with any ARM SBC (Single Board Computer) once Arch Linux ARM base is installed on the device.

The default user is *alarm* with the password *alarm*, the default root password is *root*. FYI, alarm = Arch Linux ARM and it is also the default hostname.

Anytime pacman asks for an option, just press Enter until you get to the Proceed with installation? then enter y. This is recommended for the first install of XFCE4 on the Arm device. Once you are comfortable with everything, a re-install can be done with any tweaking you desire.

After the Odroid boots up:

```
Login as root          (enter root for the username and root for the password)
# use vi or nano to edit /etc/pacman.d/mirrorlist
    comment out the server under "## Geo-IP based mirror selection and load balancing"
    un-comment servers near you (do not use US California server)
# pacman-key --init
# pacman-key --populate archlinuxarm
# pacman -Syy
# pacman -Syu
# pacman -S git
# reboot & Login as root
```

### RUN SCRIPT TO INSTALL XORG AND VANILLA XFCE4

```
# git clone https://github.com/pudges-place/EndeavourOS-ARM.git
# cd EndeavourOS-ARM
check to see if endeavour-ARM-install-V1.0.sh is executable
# ls -l
total 8
-rw-r--r-- 1 root root 5607 May  5 01:37 endeavour-ARM-install-V1.0.sh
# chmod 774 endeavour-ARM-install-V1.0.sh
# ls -l
-rwxrwxr-- 1 root root 5607 May  5 01:39 endeavour-ARM-install-V1.0.sh
# sh endeavour-ARM-install-V1.0.sh (run the installer script)
```

When installing x86\_64 EndeavourOS with the live ISO, at the “Packages” section, “base base-devel and commonly used packages” is selected by default. The first thing the ARM script does is install all these files so that EndeavourOS ARM matches EndeavourOS x86\_64.

Next a bunch of configuring is done. Then the script asks which DE you want installed. The packages are installed as per the package lists from x86\_64 EndeavourOS. The ARM install is as much as possible the same as the X86\_64 install, package for package.

The script also installs yay. Arch Linux ARM uses the same AUR as regular Arch. If you are interested in a package, go to the AUR, find the package, view the PKGBUILD for the package. The PKGBUILD has the line arch= which lists the architectures it will build for. arch=('i686' 'x86\_64' 'arm' 'armv7h' 'armv6h' 'aarch64')

In this case 'armv7h' and 'aarch64' are both listed so it will install with yay in ARM. If it says arch=('any') then it will also install with yay in ARM

The script supplies the appropriate endeavours background for the DE. They are located at

XFCE	/usr/share/backgrounds/xfce/endeavours_xfce4.png
Mate	/usr/share/backgrounds/mate/endeavours_mate.png
KDE Plasma	/usr/share/wallpapers/endeavours_plasma.png
Gnome	/usr/share/backgrounds/gnome/endeavours_gnome.png
Cinnamon	/usr/share/backgrounds/gnome/endeavours_cinnamon.png
Budgie	/usr/share/backgrounds/gnome/endeavours_budgie.png
LXQT	/usr/share/wallpapers/Next/contents/images/endeavours_lxqt.png

After the script runs, it should reboot into Lightdm, or GDM depending on DE

I did not figure out how to use sddm for KDE Plasma and LXQT. However, lightdm saved the day. Whatever works. If it is Lightdm, be sure to use lightdm-gtk-greeter-settings to customize your login screen.

Also, the storage capabilities of micro SD cards is limited. Consider installing a SSD in a USB3 enclosure for storing your data. It makes your data more transportable between devices, and since the data is separate from the uSD card, you can re-install and not touch the data. It is also easy to back up your data to another USB3 SSD using rsync.

I mount the external SSD in my home directory in a folder name Data. I move all the other default folders (except Desktop) to the SSD. So in the home directory there is only Desktop and Data. Documents Downloads Music Pictures Public Templates Videos are then in the /home/user/Data folder. In your favorite browser, change the download folder to /home/user/Data/Downloads folder.

Installing a Data SSD is described on the next page.

Have fun customizing your vanilla DE.

## Manually Installing a SSD or HDD for a DATA Partition

The problem with ARM devices running off a micro SD chip is the lack of storage space for your files in the user's home directory. To solve this, a user can install a SSD in a USB 3 enclosure. This SSD can be any size you can afford. Then this USB 3 SSD can be mounted during boot up in `/etc/fstab` as `/home/username/Data`. In directory `/home/username/Data` you can create the usual Downloads, Pictures, Videos, Documents, etc folders and store your data there. This also makes this data portable and easily backed up with `rsync`.

Power off the computer and connect a USB 3 external enclosure with a SSD or 3.5 inch Hard Drive installed. Boot up the computer. Login as user.

Open a terminal window and increase the window width to 100. As user

```
$ cd (to ensure the user's home directory is selected)
$ mkdir Data
$ su
  enter root password
# lsblk -F
NAME FSTYPE FSVER LABEL UUID FSAVAIL FSUSE%
MOUNTPOINT
sda
├─sda1
  ext4 1.0 b6bd3cd3-c666-4259-9ad9-125a003ff231 221.7G 0%
mmcblk1
├─mmcblk1p1
  ext4 1.0 Odroid-XU4
    275a3486-49cb-41ad-b079-e2bea16e7959 23.8G 13% /
```

`/dev/mmcblk1p1` is the single partition for our OS device. The newly added device is `/dev/sda1`. If the device is brand new and has never been partitioned it may look different. Now that it is determined that `/dev/sda` is our new device (your setup may be different such as `/dev/sdb` etc)

```
# fdisk /dev/sda
Command o (That's lower case o...create a new empty DOS partition table)
Command n (add a new partition)
  Partition type: p (p = primary)
  partition number: 1
  First sector: enter to accept default
  Last sector: enter to accept default
  Partition #1 contains a ext4 signature. (this warning may not appear, if so yes)
  do you want to remove the signature? yes
Command: w (write table to disk and exit)
```

```
# mkfs.ext4 -L DATA /dev/sda1
```

```
# lsblk -f
```

```

NAME FSTYPE FSVER LABEL UUID                               FSAVAIL FSUSE% MOUNTPOINT
sda
└─sda1  ext4  1.0  DATA b6bd3cd3-c666-4259-9ad9-125a003ff231 221.7G  0%
mmcblk1
└─mmcblk1p1  ext4
    1.0  Odroid-XU4 275a3486-49cb-41ad-b079-e2bea16e7959 23.8G  13% /

```

Notice sda does not have a MountPoint

```
# mount -t ext4 /dev/sda1 /home/username/Data
```

```
# df /dev/sda1                (should show our new /home/Data)
Filesystem 1K-blocks  Used Available  Use% Mounted on
/dev/sda1 245053044 61504 232473040  1%  /home/username/Data
```

### Modify /etc/fstab

```
# cp /etc/fstab /fstab.orig                (backup fstab)
Find the UUID for the DATA SSD partition.
```

```
# lsblk -f /dev/sda
NAME FSTYPE FSVER LABEL UUID                               FSAVAIL FSUSE%
MOUNTPOINT
sda
└─sda1 ext4  1.0  DATA b6bd3cd3-c666-4259-9ad9-125a003ff231 221.7G  0%
/home/don/Data
```

you should see /dev/sda1 with a nice label of "DATA" and its UUID number  
Highlight the UUID number, then right click and Copy

The /etc/fstab file will probably not have any entries, just a few information lines.  
Using vi or nano, add the following line at the end of the /etc/fstab file

```
# vi /etc/fstab
```

```
UUID=Paste_in_Your-UUID-Number /home/yourusername/Data ext4 defaults,noatime 0 2
```

```
# mount -a    (should show no errors if fstab is correct, if not edit /etc/fstab again)
```



Reboot the computer. If boot up is normal, Login as root and skip the box.

---

If the computer takes a long time to boot up, you made a typo and it can't find the SSD. After it times out, It will say:

You are in emergency mode.

Blah Blah

Give root password for maintenance  
(or press Control-D to continue):

Type in your root password and do a blkid to check the UUID & device name such as /dev/sdb  
Edit /etc/fstab and look for typos. When you find your mistake, reboot and see what happens.

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Now that /home is on it's own SSD

# lsblk -f

NAME	FSTYPE	FSVER	LABEL	UUID	FSAVAIL	FSUSE%	MOUNTPOINT
sda							
`-sda1	ext4	1.0	HOME	XXXXX	221.7G	0%	/home/don/Data
mmcblk1							
`-mmcblk1p1	ext4	1.0	Odroid	XXXXX	26.2G	5%	/

In terminal window as user

\$ cd (ensure you are in your home directory)

\$ ll ( check ownership as in this snippet)

```
drwxr-xr-x 10 root root 4096 May 5 21:22 Data
```

If the Data partition shows root root as ownership,

\$ sudo chown username:username /home/username/Data

\$ ll

```
drwxr-xr-x 10 don don 4096 May 5 21:22 Data (ownership should show user)
```

In the Data folder, make the usual subfolders

Documents Downloads Music Pictures Public Templates Videos as you prefer

In Firefox, or other browser, in your browser settings change the download folder to  
/home/username/Data/Downloads

Have fun theming your new Vanilla Desktop Environment to whatever you desire.

## Flash an emmc card on Odroid XU4

On an Odroid XU4, if you opt to use a emmc card as the boot device, then additional steps are necessary. There are many opinions on micro SD VS emmc. The choice is yours.

To create an emmc card, first create a micro SD card as above including booting up the Odroid-XU4, installing keys, and update. Now that everything is working up to this point, place the emmc card on the emmc to microSD converter card. Then into the USB SD READER. Boot up the x86\_64 computer with the latest EndeavourOS ISO.

Now repeat the above steps for the micro SD card but with the emmc card. When you shut down the x86\_64 computer come back here and do the following.

Set the boot switch on the Odroid-XU4 board next to the HDMI jack to the uSD position (to the left). Ensure the micro SD card is in the XU4 SD slot. On the back side of the Odroid-XU4, Connect the eMMC module to the XU4, ensuring you hear a click when doing so.

Connect a monitor, keyboard, ethernet, & apply 5VDC.

The default user is *alarm* with the password *alarm*, the default root password is *root*.

Login as root

```
# sh /boot/sd_fusing.sh /dev/mmcblk0
```

fusing should take place without errors. Poweroff the Odroid. Remove the micro SD card. Switch the boot selector switch to emmc (to the right). Power up the Odroid. You should now be running on the emmc card. Login as root.

```
# pacman-key --init
```

```
# pacman-key --populate archlinuxarm
```

```
# pacman -Syu
```

Now go back to The "Configure the Operating System for a Server" section and continue configuration.