

Install a base EndeavourOS for a Simple Home Server

Objective: Install a minimal EndeavourOS on x86_64 hardware for use as a simple home LAN server. The server will utilize one storage device for the Operating System, one storage device for the server's DATA, and one storage device for DATA backup. Running the script will install a minimal EndeavourOS and partition, format, and mount the OS and DATA storage devices. Options available are msdos or UEFI partition tables, and either the current kernel or the LTS kernel. After the install, if auto partition was used on both devices, the server will be fully configured except for one ufw firewall rule. Besides the usual OS configuration, included will be a Static IP Address, and installation of endeavour-keyring, endeavouros-mirrorlist, and the EndeavourOS version of yay.

Select a port number for SSH

For security reasons, do not use the default SSH port 22. Think of this as a PIN. Instead of Personal Identification Number it is a Port Identification Number. Pick a four or five digit PIN. Go to wikipedia's TCP port list and choose a port number between 8000 and 48000.

[TCP and UDP port numbers](https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers)

https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers

Unused numbers are not listed. Look for a group of numbers that aren't being used, such as 9339 is listed (used) and the next number listed is 9389. That's a block of 50 port numbers that you can use. Choose something in the middle. If you want a 5 digit PIN scroll to 10,000 and above and look for unused blocks.

9339	Yes	Clash of Clans , a mobile freemium strategy video game	Unofficial
9389	Yes	Yes adws, Microsoft AD DS Web Services, Powershell uses this port	Official

The script will prompt you for your chosen SSH port number.

Other information needed

Install current kernel or LTS kernel

Desired hostname: the instructions use enosServer as an example, change it if you want

Desired user name: the instructions use pshare as an example, change it if you want

Desired Last Octet of a Static IP address for this computer:

Desired SSH port number as chosen above

root password

user password

On a x86_64 computer that will become the server, hook up a monitor, keyboard, and mouse. After installation, the monitor, keyboard, and mouse can be disconnected and the server can be run headless. Connect a small SSD or HD on SATA 1. Anything over 32 GB will work fine. The smallest SSD they sell lately is 120 or 128 GB which can be obtained for about \$25 USD. Of course anything laying around in the parts bin will work.

As an option, the storage device for DATA can also be installed on the SATA 2 port or a USB port. Then the DATA device can be optionally partitioned, formatted, and mounted and will be included in /etc/fstab during the genfstab command.

Boot up the latest EndeavourOS install ISO. During Bootup, press Delete key or F2, and disable the WiFi in the firmware if possible. Choose whether to boot the msdos/MBR version or the UEFI version of the installer. For a LAN server, I recommend msdos/MBR, but you can choose which ever you desire.

During testing, a 32 GB USB thumb drive can be used for the OS, and another 32 GB USB thumb drive for the DATA drive. Not practical, but OK for testing before deciding to obtain permanent hardware. Note: USB thumb drives can be hit or miss. Some work well, some are extremely slow during installation, and 1st boot, then OK after that.

Open a terminal window as liveuser

```
$ git clone https://github.com/pudges-place/EndeavourOS-baseinstall.git
```

```
$ cd EndeavourOS-baseinstall
```

```
$ chmod 744 install*      (make scripts executable)
```

```
$ ls -l
```

```
-rwxr--r-- root root ..... install-base1.sh
```

```
-rwxr--r-- root root ..... install-base2.sh
```

```
$ sudo ./install-base1.sh
```

Brings up the first page of the script, which has a description of what it does and offers an option to manually partition your mass storage device outside of the script. If you want to manually partition your OS drive, leave this page up as a guide while using GParted or what ever. When partitioning is completed, continue with the script
OR

You can let the script automatically partition the selected storage device(s).

During formatting,

"/dev/sda1 contains a ext4 file system, proceed anyway y,n"

or something similar may occur, enter y and go on.

A notice will appear when finished

The user can re-enter arch-chroot and use pacman to add or delete desired packages.

When finished, enter the sudo umount -a command, then shut down the computer.

POST INSTALL

When finished installing, remove install media and boot up then log-in as root.
Now is the time to do a little exploring and see if everything is as expected.

```
# ping -c 4 endeavouros.com      (should get 0% packet loss)
# ip addr                        (line 2: should show static IP you entered)
# date
  Thu 23 Jan 2020 01:50:52 PM MST  (check time and date are correct)
# pacman -Q | grep keyring      (to double check if endeavouros-keyring was installed)
# pacman -Q | grep mirrorlist   (to double check if endeavouros-mirrorlist was installed)

# df -h          the root directory will show approximately 2.2 Gbyte used for the install
# pacman -Q > pkglist
# wc -l pkglist   (will show approx 165 packages installed)
  165 pkglist
# less pkglist    (will display installed packages)
# htop            ( will display memory usage)
```

IMPORTANT

The install should have added pshare to the users group. As a check

```
# groups pshare
  users pshare
```

If users wasn't listed do the following to add pshare to the users group

```
# gpasswd -a pshare users
# groups pshare
  users pshare
```

```
# ls -l /          (listing of the root directory)
```

Should see two directories named server and serverbkup. These are the mount points for the DATA device and the DATABKUP device when doing backups. Check the permissions and ownership for these two directories as shown below, which are edited for clarity

```
drwxrwxr--. root users  server
drwxrwxr--. root users  serverbkup
```

If they are not correct, issue the following commands as root

```
# chown root:users /server /serverbkup
# chmod 774 /server /serverbkup
```

Note that user pshare is a member of two groups, pshare AND users.

Note that the ownership of the /server /serverbkup mount points is root AND users.

This relationship of the group users between the user and the mount points is key to what makes this work. This should be done already by the script, but it doesn't hurt to check to check them, plus you are now familiar with a important aspect of how things work.

You set the hostname for your server during install. If you wish to change it

```
# hostnamectl set-hostname MyServer.localdomain - -static
# hostnamectl status      (to verify your new hostname if you changed it.)
```

SETUP A FIREWALL RULE to allow a Linux Client Computer access on
A rule must be set up to allow the Linux Client Computer access on SSH.

```
# ufw status      (check status of ufw)
status: active
```

Use the format: ufw allow from xxx.xxx.xxx.0/24 to any port XXXX
where xxx.xxx.xxx.0/24 is the Router's IP address block, XXXX is your chosen SSH port

```
# ufw allow from 192.168.0.0/24 to any port 9830
```

```
# ufw status
Status: active
```

To	Action	From
--	-----	----
9830	ALLOW	192.168.0.0/24

Now anything coming in from any IP address on our private LAN (192.168.0.0/24) going to the ssh port (XXXX) is allowed. Anything coming in from an IP address outside of our private LAN is rejected. The entire world is blocked but any computer on our ethernet LAN is accepted on port XXXX.

If you chose auto partitioning of the OS device AND chose auto partitioning of the DATA device, you are now finished with your simple Home LAN server. The monitor, keyboard, and mouse can be removed to run the server headless. Maintenance can be performed in a Linux Client using SSH. If you chose manual partitioning or during auto partition chose not to partition the DATA device, instructions follow on how to do that if needed.

Since this is a script, the user can use a text editor to edit install-base1.sh and change the pacstrap entries to add or delete packages to be installed. Currently, this is lines 600 to 610. The script is meant to be the base for a EndeavourOS server, but by editing the pacstrap entries you could add DHCP, WiFi modules, or whatever and make it your own.

To make this modular, four more installments will follow. The users can pick and choose what they want to install on their LAN server, These will include:

1. Configure a Linux to Linux client
2. Install SAMBA on the server and configure a Windows client.
3. Install minidlna on the server and setup minidlna in a Linux or Windows client.
4. Last, but definitely not least, format an external USB 3 storage device and prepare for doing backups of the Data disk. This is an absolute must.

INSTALLING A DATA SSD

Power off the computer and install a SSD on SATA port 2, or connect a USB 3 external enclosure with a SSD or 3.5 inch hard drive installed. Now is the time for the BIG SSD or Hard Drive. Boot up the server computer and log in as root.

In all instances, the device names presented (`/dev/sda` and `/dev/sdb`) are just examples and may need to be changed for your hardware, such as `/dev/sdc`, `/dev/nvme0n1`, or whatever is appropriate.

```
# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
sda   8:0    0 119.2G 0 disk
├─sda1 8:1    0   1G  0 part /boot
├─sda2 8:2    0 110.4G 0 part /
└─sda3 8:3    0   7.9G 0 part [SWAP]
sdb   8:16   1   30G  0 disk
└─sdb1 8:17   1   30G  0 part
```

It can be seen that `/dev/sda1` `/dev/sda2` and `/dev/sda3` are the partitions for our OS device. Another clue is `sdb1` does not have a Mount Point. The newly added device is `/dev/sdb1`. If the device is brand new and has never been partitioned it may look different. Now that it is determined that `/dev/sdb` is our DATA device

```
# fdisk /dev/sdb          (adjust device name as needed)
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 vfat signature. (this warning may not appear, if so answer yes)
  do you want to remove the signature? yes
Command: w               (write table to disk and exit)
```

```
# mkfs.ext4 -L DATA /dev/sdb1
```

The `/server` mount point was created during installation. If not present, as root

```
# cd /                    (Change to root directory)
# mkdir /server
# chown root:users /server
# chmod 774 /server
```

You should now have something similar to this snippet.

```
# ll /
drwxrwxr- - 46 root users 4096 Aug 15 22:15 server
```

The `/serverbkup` directory is used for mounting SSD partitions. You should never put any files or sub-directories in this reserved directory.

Modify /etc/fstab

Find the UUID that was assigned at formatting for the DATA SSD partition.

```
# lsblk -f
NAME FSTYPE FSVER LABEL UUID                               FSAVAIL FSUSE%
MOUNTPOINT
sda
├─sda1 ext4 1.0 BOOT 2c62db75-2ad5-49bc-92b5-2a4a999ca616 850.6M 6% /boot
├─sda2 ext4 1.0 ROOT 56fc3f86-e03d-448e-bc47-0a0f9c0e5134 104G 2% /
└─sda3 swap 1          e772c577-de12-43e8-ba5b-75720992f8b2          [SWAP]
sdb
└─sdb1 ext4 1.0 DATA 373fec37-5b49-44ba-b618-0009613e3ca0
```

you should see /dev/sdb1 with a nice label of "DATA" and its UUID number.
Copy the UUID number on a sheet of paper.

```
# cp /etc/fstab /etc/fstab-bkup      (always make a back up of config files before editing)
```

Using vi or nano, add the following line at the end of the /etc/fstab file

```
UUID=Your-UUID-Number /server ext4 defaults,relatime,discard 0 2
```

close /etc/fstab

```
# mount UUID=373fec37-5b49-44ba-b618-0009613e3ca0 /server
The UUDI should be that of /dev/sdb1 to test if /etc/fstab is correct
```

```
# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
sda   8:0    0 119.2G 0 disk
├─sda1 8:1    0 1G 0 part /boot
├─sda2 8:2    0 110.4G 0 part /
└─sda3 8:3    0 7.9G 0 part [SWAP]
sdb   8:16   1 30G 0 disk
└─sdb1 8:17   1 30G 0 part /server
```

If sdb1 now shows a mount point of /server then the fstab is configured correctly.
Reboot the server computer. If not, try editing /etc/fstab again.

If it boots up normally, log back in 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.

Make sure the /server directory is correct. You should have something similar to this snippet.

```
# ll /
```

```
drwxrwxr- - 46 root users 4096 Aug 15 22:15 server
```

check the permissions (drwxrwxr--) and ownership (root users) and make sure they are correct. If they are correct, then fstab is doing its job and skip the box. If they are not correct, then follow the instructions in the box.

```
# cd /
```

```
# chown root:users /server
```

```
# chmod 774 /server
```

```
# ls -l /
```

```
drwxrwxr-- 3 root users 4096 Dec 28 11:15 server
```

Reboot the computer, then login and become root

```
# ls -l /
```

Recheck the permissions (drwxrwxr--) and ownership (root users) and make sure they are correct.

If you edit the /etc/fstab file for any reason, after reboot be sure to check /server and /serverbkup for the permissions and ownership again as editing fstab has a nasty habit of changing stuff when mounting devices to /

If they are not correct, issue the following and recheck:

```
# chown root:users /server
```

```
# chmod 774 /server
```

Now that ownership and permissions are set

```
# su pshare    (Switch User to pshare)
```

```
$ ll /server
```

```
drwx----- 2 root root 16384 Dec 28 11:15 lost+found
```

You should see the lost+found directory created during formatting, at least with ext4

Now test and make sure pshare can access /server

```
$ echo "this is a test" > /server/test
```

```
$ ll /server
```

```
-rw-r--r-- 1 pshare pshare  15 Dec  9 19:21 test
```

```
$ cat /server/test
```

```
this is a test
```

```
$ exit
```

On it's own separate SSD you have a working partition at /server for all your data. Always work in /server as a user. lost+found was generated by the computer as root. Which is fine as it is only for the computer's use. Everything else in /server should belong to user pshare, including all files and directories. Don't worry, after the next installation,

1. Configure a Linux to Linux client

this will all be taken care of.