Install pfSense 2.6.0 Community Edition On PC Engines APU4D4

This howto will guide you through the installation process for pfSense 2.6.0 on a PC Engines APU4D4. You can find generic installation instructions in the netgate documentation.

Sources

- https://www.pfsense.org/download/
- https://docs.netgate.com/pfsense/en/latest/
- https://docs.netgate.com/pfsense/en/latest/install/index.html
- https://docs.netgate.com/pfsense/en/latest/install/install-pfsense.html
- https://forum.netgate.com/topic/162959/root-mount-waiting-for-cam/6
- https://pcengines.ch/apu4d4.htm
- https://pcengines.ch/pdf/apu4.pdf

Prerequisites

- USB flash drive (e.g.)
- USB to serial converter (e.g.)
- Null modem cable (e.g.)
- mSATA disk plugged into the mSATA-port of the PC Engines APU4D4-board (e.g.)

Serial Console Image Download

All commands are assumed to be executed as root.

Download the installer image (360 MB)

```
cd ~/Downloads
wget https://frafiles.netgate.com/mirror/downloads/pfSense-CE-memstick-serial-2.6.0-RELEASE-amd64.img.gz
```

Alternatively - Browse to the pfSense download page and download the "Latest Stable Version (Community Edition)" (direct link) to your local harddisk.

- Version: 2.6.0
- Architecture: AMD64 (64-bit)
- Installer: USB Memstick Installer
- Console: Serial
- Mirror: <select the mirror server closest to your location>

This should result in a downloaded file "pfSense-CE-memstick-serial-2.6.0-RELEASE-amd64.img.gz" somewhere on your local file system.

Verify the installer integrity

```
sha256sum -c <<< $(lynx --dump
https://www.pfsense.org/hashes/pfSense-CE-memstick-serial-2.6.0-RELEASE-amd64.img.gz.sha256)
```

pfSense-CE-memstick-serial-2.6.0-RELEASE-amd64.img.gz: OK

Prepare Installation Media

Decompress the installer image (this will result in a 800 MB file)

Last update: 2022/03/05 pages:howtos:pfsense:install_pfsense_260_on_apu_4d4 https://wiki.nanoscopic.de/doku.php/pages/howtos/pfsense/install_pfsense_260_on_apu_4d4 13:01

gzip -d pfSense-CE-memstick-serial-2.6.0-RELEASE-amd64.img.gz

Plug the USB flash drive into a USB-port an find its device name

lsblk

```
NAME
      MAJ:MIN RM
                   SIZE RO TYPE MOUNTPOINTS
              0 238,5G 0 disk
        8:0
sda
 -sdal
        8:1
               0
                     8M 0 part
 -sda2
        8:2
               0 222,9G 0 part /var
                                 /usr/local
                                 /srv
                                 /root
                                /opt
                                /home
                                /boot/grub2/x86 64-efi
                                /boot/grub2/i386-pc
                                /.snapshots
               0 15,6G 0 part [SWAP]
 -sda3
        8:3
sdb
              1
        8:16
                   1,9G 0 disk
└_sdb1
                   1,9G 0 part
        8:17
               1
sr0
       11:0
               1 1024M 0 rom
```

The USB flash drive (in my case) is /dev/sdb.

Wipe the partition table of the USB flash drive

dd if=/dev/zero of=/dev/sdb bs=1M count=1

```
1+0 records in
1+0 records out
1048576 bytes (1.0 MB, 1.0 MiB) copied, 0.413913 s, 2.5 MB/s
```

Now write the installer image to the USB flash drive

dd bs=1M if=./pfSense-CE-memstick-serial-2.6.0-RELEASE-amd64.img of=/dev/sdb && sync

```
799+1 records in
799+1 records out
837919232 bytes (838 MB, 799 MiB) copied, 142.203 s, 5.9 MB/s
```

Connect To The Serial Console

Use the USB to serial converter and null modem cable to connect your workstation to the APU4D4 serial port and find the device name of your serial converter

ls -la /dev/ttyUSB*

crw-rw---- 1 root dialout 188, 0 Feb 9 18:51 /dev/ttyUSB0

dmesg | grep ttyUSB

[120741.844003] usb 3-1.2: FTDI USB Serial Device converter now attached to ttyUSB0

so, the device seems to be /dev/ttyUSBO.

check if your terminal is using UTF8 encoding

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locale charmap

UTF-8

now connect a terminal to the serial console

screen /dev/ttyUSB0 115200

Installation Of pfSense

Plug the USB flash drive into the USB port of your APU4D4 and power on your device. For boot options press F10.

SeaBIOS (version rel-1.12.1.3-0-g300e8b7)

Press F10 key now for boot menu

Select boot device:

USB MSC Drive Kingston DataTraveler R PMAP
 AHCI/0: SATA SSD ATA-11 Hard-Disk (15272 MiBytes)
 Payload [setup]
 Payload [memtest]

press 1 to boot from the USB flash drive.

Wait for pfSense to finish the autoboot sequence and until a prompt, asking for the console type, will appear

Welcome to pfSense!

```
Please choose the appropriate terminal type for your system.
Common console types are:
   ansi Standard ANSI terminal
   vt100 VT100 or compatible terminal
   xterm xterm terminal emulator (or compatible)
   cons25w cons25w terminal
```

Console type [vt100]:

press ENTER to accept the default vt100 type

```
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                                                                       28%
                                <Accept>
```

press ENTER to accept the copyright and distribution notice

ense Installer		
Welcome to pfSense!	Welcome	
Install Rescue Shell Recover config.xml	Install pfSense Launch a shell for rescue operations Recover config.xml from a previous install	
<	OK > <cancel></cancel>	

press ENTER to start the installation process

pfSense Installer

Keymap Selection The system console driver for pfSense defaults to standard "US" keyboard map. Other keymaps can be chosen below.
<pre>>>> Continue with default keymap ->- Test default keymap () Armenian phonetic layout () Belarusian () Belgian () Belgian (accent keys) () Brazilian (accent keys) () Brazilian (without accent keys) () Bulgarian (BDS) () Bulgarian (Phonetic) () Canadian Bilingual 1(+)12%</pre>
<select> <cancel> [Press arrows, TAB or ENTER]</cancel></select>

use the up/down arrow keys (\uparrow / \downarrow) to move to the line with your corresponding keymap, then press ENTER to select it

pfSense Installer

Keymap Selection The system console driver for pfSense defaults to standard "US" keyboard map. Other keymaps can be chosen below.
<pre>>>> Continue with de.kbd keymap ->- Test de.kbd keymap () Armenian phonetic layout () Belarusian () Belgian () Belgian (accent keys) () Brazilian (accent keys) () Brazilian (without accent keys) () Bulgarian (BDS) () Bulgarian (Phonetic) () Canadian Bilingual </pre>
<select> <cancel> [Press arrows, TAB or ENTER]</cancel></select>

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Test the currently selected keymap

press up arrow key (\uparrow) and then $\overrightarrow{\text{ENTER}}$ to use the selected keymap

pfSense Installer

Partitioning How would you like to partition your disk? Auto (ZFS) Guided Root-on-ZFS Auto (UFS) BIOS Guided Disk Setup using BIOS boot method Auto (UFS) UEFI Guided Disk Setup using UEFI boot method Manual Manual Disk Setup (experts) Shell Open a shell and partition by hand < OK > <Cancel>

press ENTER to go with the default "Guided Root-on-ZFS" option

pfSense Installer

>>> Install	Proceed with Installation
T Pool Type/Disks:	stripe: 0 disks
- Rescan Devices	*
- Disk Info	*
N Pool Name	pfSense
4 Force 4K Sectors?	YES
E Encrypt Disks?	NO
P Partition Scheme	GPT (BIOS)
S Swap Size	1g
M Mirror Swap?	NO
W Encrypt Swap?	NO

Create ZFS boot pool with displayed options

press ENTER to accept the selected partition and filesystem options and to proceed with installation

pfSense Installer

```
ZFS Configuration
Select Virtual Device type:
stripe Stripe - No Redundancy
mirror Mirror - n-Way Mirroring
raid10 RAID 1+0 - n x 2-Way Mirrors
raid21 RAID-Z1 - Single Redundant RAID
raid22 RAID-Z2 - Double Redundant RAID
raid23 RAID-Z3 - Triple Redundant RAID
< OK > <Cancel>
```

[Press arrows, TAB or ENTER]_____

[1+ Disks] Striping provides maximum storage but no redundancy

press ENTER to accept the selected ZFS configuration options (Stripe - No Redundancy) and to proceed with installation

pfSense Installer



press SPACE select ada0 and then ENTER to proceed with the installation

pfSense Installer

Last Chance! Are you sure you want to destroy the current contents of the following disks:	
a0a0	
< YES > < NO > [Press arrows TAB or ENTER]	

press left arrow key (-) and then ENTER to install pfSense to the mSATA SSD

pfSense Installer

Manual Configuration The installation is now finished. Before exiting the installer, would you like to open a shell in the new system to make any final manual modifications? < Yes > < No >

press ENTER to continue

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pfSense Installer

Complete
Installation of pfSense
complete! Would you like
to reboot into the
installed system now?
<reboot> <shell></shell></reboot>

press ENTER to reboot into the installed pfSense system.

When pfSense has booted up, you can connect a computer to **eth1** and let it get an IP configuration via DHCP. Then use a browser to connect to the web configuration GUI of pfSense at https://192.168.1.1/. The default user name is "**admin**" and the password is "**pfsense**".



~~DISCUSSION~~

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