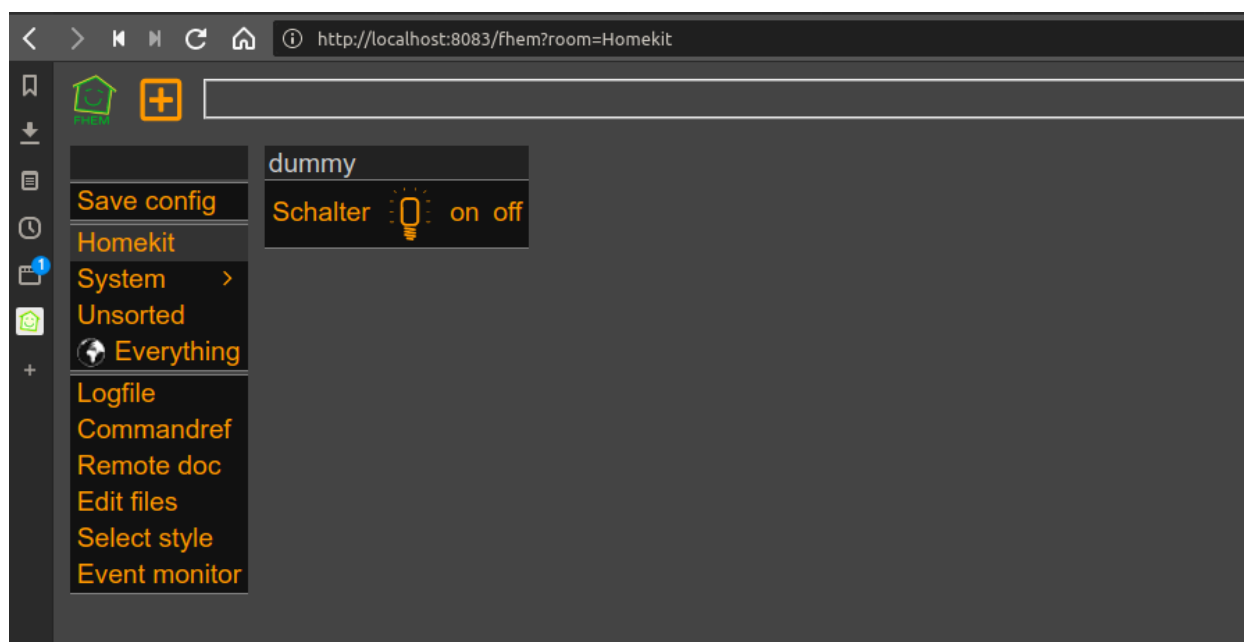


# Home Automation Stack



The stack contains everything to run FHEM on a Docker host. Mosquitto is used as message broker. SIRC functions are realized with the help of a homebridge container. The complete stack runs on x86 as well as arm architectures. It is very easy to clone its complete productive environment and has a simple way to build a test system.

## Table of content

- Todo
- Requirements
- Installation raspberrypi
  - Raspian Download
  - System Update
  - Set timezone
  - Raspberry Config
  - Disable swap
  - Install additional packages
  - Configure ntpd daemon
  - Install oh-my-zsh
  - Install log2ram (/var/log 2 ram)
  - Setup ssh key for user

- Install docker & docker-compose
  - git repository export and start all container
  - Access the application
    - \* FHEM
    - \* influxdb
- Container
  - Tasmota Admin
  - Tasmota Compiler
  - Homebridge
  - Portainer
  - Deconz
- Configuring Raspbian for RaspBee
  - Watchtower
- ctop
  - Description
  - Installation
  - Installation Linux
    - \* x86 Platform
    - \* arm Platform
- Known Issues
  - FHEM website not reachable
- Accessing the docker container via remote
- Contributing to fhemdocker

## Todo

- ☐ Mosquitto user-/groupid problem
- ☐ Grafana integration

## Requirements

- docker
- docker-compose

## Installation raspberrypi

### Raspian Download

Download the image of your choice: Raspian Download Unzip the image and install it with:

```
sudo dd bs=4M if=2021-10-30-raspbian-bullseye-armhf-lite.img of=/dev/mmc  
sync
```

Eject the card and insert it again to mount the filesystems boot & rootfs. Touch a blank file ssh to enable sshd daemon on first boot.

```
sudo touch /media/boot/ssh  
sync  
umount /media/boot  
umount /media/rootfs
```

Eject the card and insert into your raspberrypi. After that power on the rpi and login with the known user **pi** and password **raspberrypi**.

```
ssh pi@raspberrypi4
```

Change your password with the command

```
pi@raspberrypi:~ $ passwd  
Changing password for pi.  
Current password:  
New password:  
Retype new password:  
passwd: password updated successfully  
pi@raspberrypi:~ $
```

### System Update

```
sudo apt-get update  
sudo apt-get dist-upgrade
```

**Set timezone**

```
sudo dpkg-reconfigure tzdata
```

**Raspberry Config**

- 1) Expand the root filesystem (A1 / Advanced Options)
- 2) Update raspi-config

```
sudo raspi-config sudo reboot
```

**Disable swap**

```
sudo dphys-swapfile swapoff && \  
sudo dphys-swapfile uninstall && \  
sudo systemctl disable dphys-swapfile
```

**Install additional packages**

```
sudo apt-get install wget git apt-transport-https vim telnet zsh zsh-  
autosuggestions zsh-syntax-highlighting ntp ksh logwatch
```

**Configure ntpd daemon**

```
sudo vi /etc/ntp.conf
```

Disable all pool server and add your local time server

```
server 192.168.1.1
```

**Install oh-my-zsh**

```
sh -c "$(curl -fsSL https://raw.githubusercontent.com/ohmyzsh/ohmyzsh/master/tools
```

**Install log2ram (/var/log 2 ram)**

github page log2ram

```
echo "deb http://packages.azlux.fr/debian/ buster main" | sudo tee /etc
wget -qO - https://azlux.fr/repo.gpg.key | sudo apt-key add -
apt update
apt install log2ram
```

**Setup ssh key for user**

```
ssh-keygen -t rsa -b 8192
```

**Install docker & docker-compose**

After installation put your user pi into the docker group.

```
#curl -sSL https://get.docker.com | sh
#sudo systemctl enable docker
#sudo systemctl start docker
sudo apt-get install docker docker-compose
sudo usermod -aG docker pi
sudo reboot
```

**git repository export and start all container**

Note: Please run the startup.sh script after cloning.

```
cd
git clone https://github.com/stormmurdoc/fhemdocker.git
cd fhmdocker
./startup.sh
```

## Access the application

### FHEM

#### FHEM tmux session inside the container

```

fhem
fhem@f708a9d03d01:~$ fhem
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^['.
Inform on
update
Executing the update the background.
2020.02.07 20:18:06.686 1 : Downloading https://fhem.de/fhemupdate/controls_fhem.txt
2020.02.07 20:18:06.917 1 : RMDIR: ./restoreDir/update/2020-02-04
2020.02.07 20:18:07.151 1 : UPD FHEM/30_HUEBridge.pm
2020.02.07 20:18:07.212 1 : UPD FHEM/98_structure.pm
2020.02.07 20:18:07.341 1 : saving fhem.cfg
2020.02.07 20:18:07.344 1 : saving ./log/fhem.save
2020.02.07 20:18:07.351 1 : Calling /usr/bin/perl ./contrib/commandref_modular.pl, this may take
a while
2020.02.07 20:18:07.713 1 :
2020.02.07 20:18:07.714 1 : update finished, "shutdown restart" is needed to activate the change
s.
2020.02.07 20:18:07.714 1 :
2020.02.07 20:18:08.472 1 : fheminfo Statistics data sent to server. See Logfile (level 4) for d
etails.
Global global UPDATE
2020.02.07 20:18:17.680 3 : myHmUART: Unknown code A0FD686102E6B7A0000000A88AA0B0900::--84:myHmUA
RT, help me!
HmUARTLGW myHmUART UNKNOWNCODE A0FD686102E6B7A0000000A88AA0B0900::--84:myHmUART

```

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
16546	fhem	20	0	12304	7668	4072	R	8.7	0.8	0:00.13	/usr/bin/python3 /usr/bin/power
16545	fhem	20	0	11876	7148	3888	R	8.1	0.7	0:00.12	/usr/bin/python3 /usr/bin/power
11217	fhem	20	0	8152	2644	1872	S	2.0	0.3	0:02.44	tmux new-session ; send-keys jo
1	root	20	0	7620	2492	2232	S	1.3	0.2	1:11.34	/bin/bash /entry.sh start
15170	fhem	20	0	2852	1856	1552	S	0.7	0.2	0:00.60	htop
17561	fhem	20	0	2892	1840	1536	R	0.7	0.2	0:00.17	htop
3967	fhem	20	0	67764	58756	5408	S	0.7	5.9	0:20.85	perl fhem.pl fhem.cfg
17113	fhem	20	0	9908	3096	2356	S	0.7	0.3	0:00.09	sshd: fhem@pts/1
11268	fhem	20	0	2720	1800	1496	S	0.0	0.2	0:01.07	htop
3941	root	20	0	8880	2756	2632	S	0.0	0.3	0:00.00	/usr/sbin/sshd
4060	root	20	0	9908	5076	4336	S	0.0	0.5	0:00.03	sshd: fhem [priv]
4077	fhem	20	0	9908	3288	2548	S	0.0	0.3	0:00.02	sshd: fhem@pts/0
4087	fhem	20	0	2688	2124	1804	S	0.0	0.2	0:00.01	-bash
11252	fhem	20	0	2688	2176	1860	S	0.0	0.2	0:00.00	-bash
11254	fhem	20	0	2688	2168	1852	S	0.0	0.2	0:00.01	-bash
11257	fhem	20	0	2688	2128	1864	S	0.0	0.2	0:00.01	-bash
12770	fhem	20	0	2688	2172	1852	S	0.0	0.2	0:00.01	-bash
12784	fhem	20	0	2084	1476	1312	S	0.0	0.1	0:00.00	rwrap telnet localhost 7072

```

F1=help F2=Setup F3=Search F4=Filter F5=Free F6=SortBy F7=Nice F8=Nice F9=Kill F10=Quit
ART, help me!
2020.02.07 20:15:43.152 3: myHmUART: Unknown code A0C66847030575F00000000D026::--83:myHmUART, h
elp me!
2020.02.07 20:16:39.330 3: myHmUART: Unknown code A0C2086702687CA000000003E64::--59:myHmUART, h
elp me!
2020.02.07 20:16:44.320 3: myHmUART: Unknown code A0CA4865A358B95000000A0C527::--84:myHmUART, h
elp me!
2020.02.07 20:17:04.307 3: myHmUART: Unknown code A0CA48470358B950000000C527::--85:myHmUART, h
elp me!
2020.02.07 20:18:06.686 1: Downloading https://fhem.de/fhemupdate/controls_fhem.txt
2020.02.07 20:18:06.917 1: RMDIR: ./restoreDir/update/2020-02-04
2020.02.07 20:18:07.151 1: UPD FHEM/30_HUEBridge.pm
2020.02.07 20:18:07.212 1: UPD FHEM/98_structure.pm
2020.02.07 20:18:07.341 1: saving fhem.cfg
2020.02.07 20:18:07.344 1: saving ./log/fhem.save
2020.02.07 20:18:07.351 1: Calling /usr/bin/perl ./contrib/commandref_modular.pl, this may tak
e a while
2020.02.07 20:18:07.713 1:
2020.02.07 20:18:07.714 1: update finished, "shutdown restart" is needed to activate the chang
es.
2020.02.07 20:18:08.472 1: fheminfo Statistics data sent to server. See Logfile (level 4) for
details.
2020.02.07 20:18:17.680 3: myHmUART: Unknown code A0FD686102E6B7A0000000A88AA0B0900::--84:myHmU
ART, help me!

```

Abbildung 1: “fhemtmux”

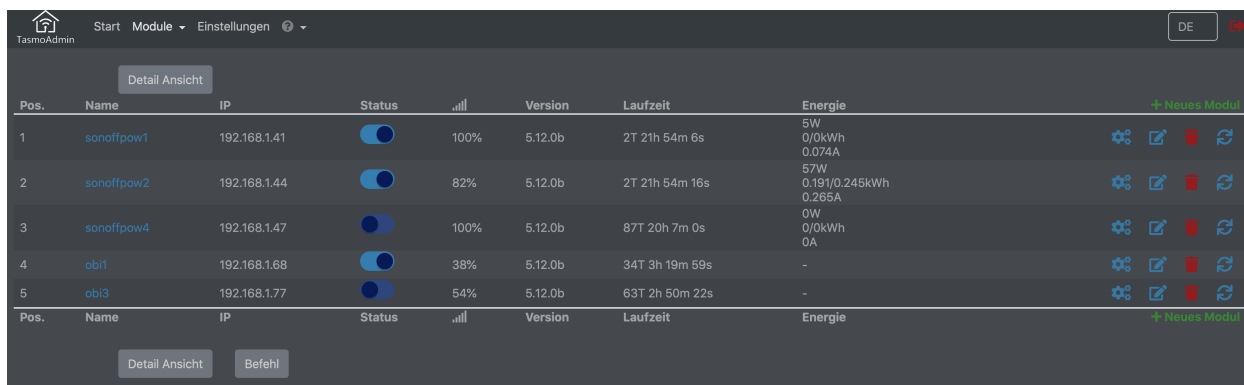
<http://localhost:80>

### influxdb

Further details about the influxdb module can be found [here](#). FHEM Wiki influxdb

## Container

### Tasmota Admin



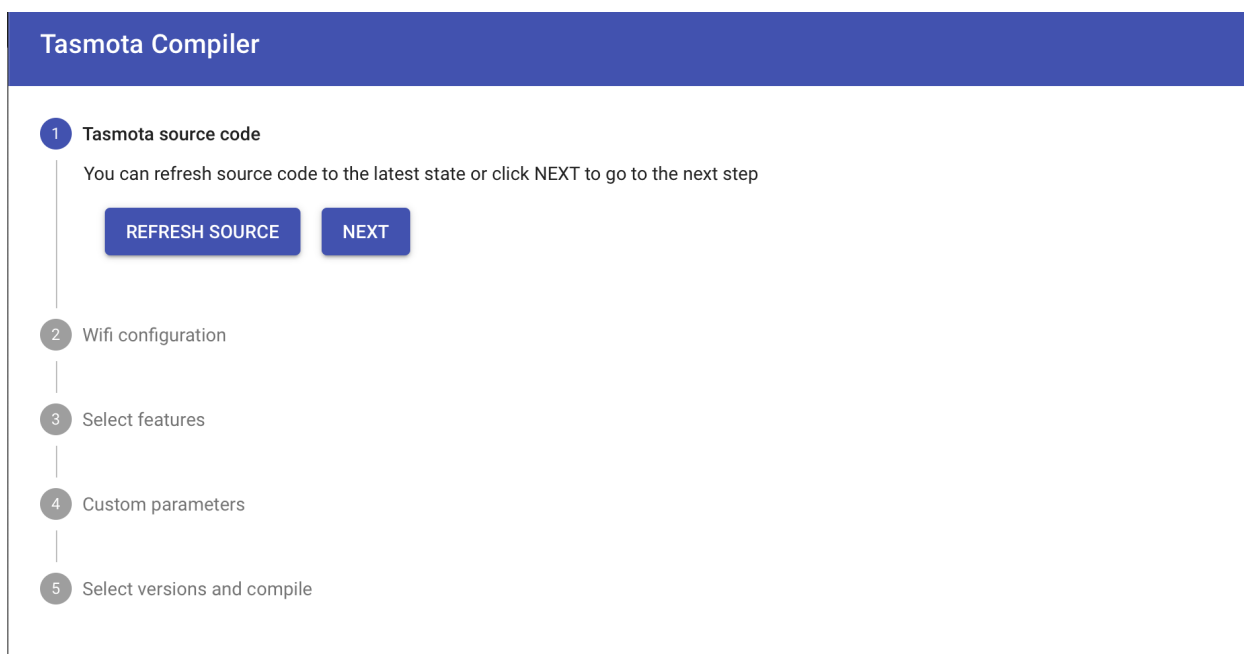
The screenshot shows the Tasmota Admin web interface. At the top, there is a navigation bar with 'Start', 'Module', 'Einstellungen', and a language selector set to 'DE'. Below the navigation bar, there is a 'Detail Ansicht' button. The main content is a table with the following columns: Pos., Name, IP, Status, Signal strength, Version, Laufzeit, and Energie. There are five rows of data, each representing a module. To the right of the table, there is a '+ Neues Modul' button. At the bottom of the table, there are 'Detail Ansicht' and 'Befehl' buttons.

Pos.	Name	IP	Status	Signal	Version	Laufzeit	Energie
1	sonoffpow1	192.168.1.41	On	100%	5.12.0b	2T 21h 54m 6s	5W 0/0kWh 0.074A
2	sonoffpow2	192.168.1.44	On	82%	5.12.0b	2T 21h 54m 16s	57W 0.191/0.245kWh 0.265A
3	sonoffpow4	192.168.1.47	On	100%	5.12.0b	87T 20h 7m 0s	0W 0/0kWh 0A
4	obi1	192.168.1.68	On	38%	5.12.0b	34T 3h 19m 59s	-
5	obi3	192.168.1.77	On	54%	5.12.0b	63T 2h 50m 22s	-

**Abbildung 2:** “tasmotaadmin”

<http://localhost:8081>

### Tasmota Compiler



The screenshot shows the Tasmota Compiler web interface. It has a blue header with the title 'Tasmota Compiler'. Below the header, there is a vertical list of five steps: 1. Tasmota source code, 2. Wifi configuration, 3. Select features, 4. Custom parameters, and 5. Select versions and compile. Step 1 is currently selected and highlighted. Below step 1, there is a text prompt: 'You can refresh source code to the latest state or click NEXT to go to the next step'. Below this text, there are two buttons: 'REFRESH SOURCE' and 'NEXT'.

**Abbildung 3:** “tasmotacompiler”

<http://localhost:8082>

## Homebridge

Default User: admin Default Passwort: admin

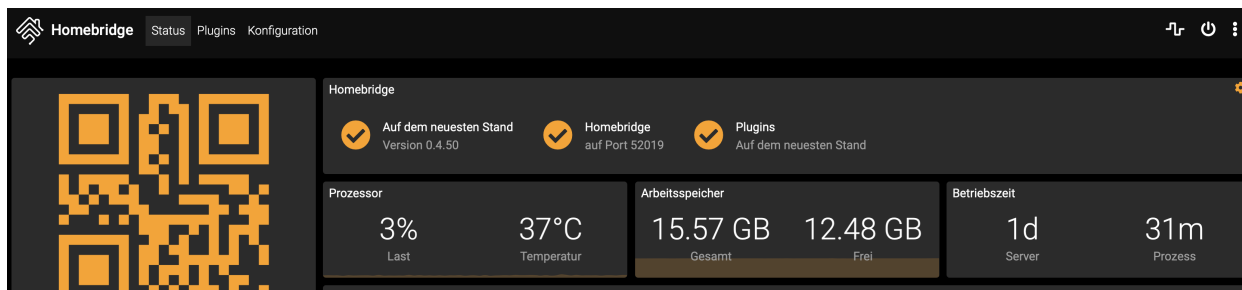


Abbildung 4: "homebridge"

<http://localhost:8080>

## Portainer

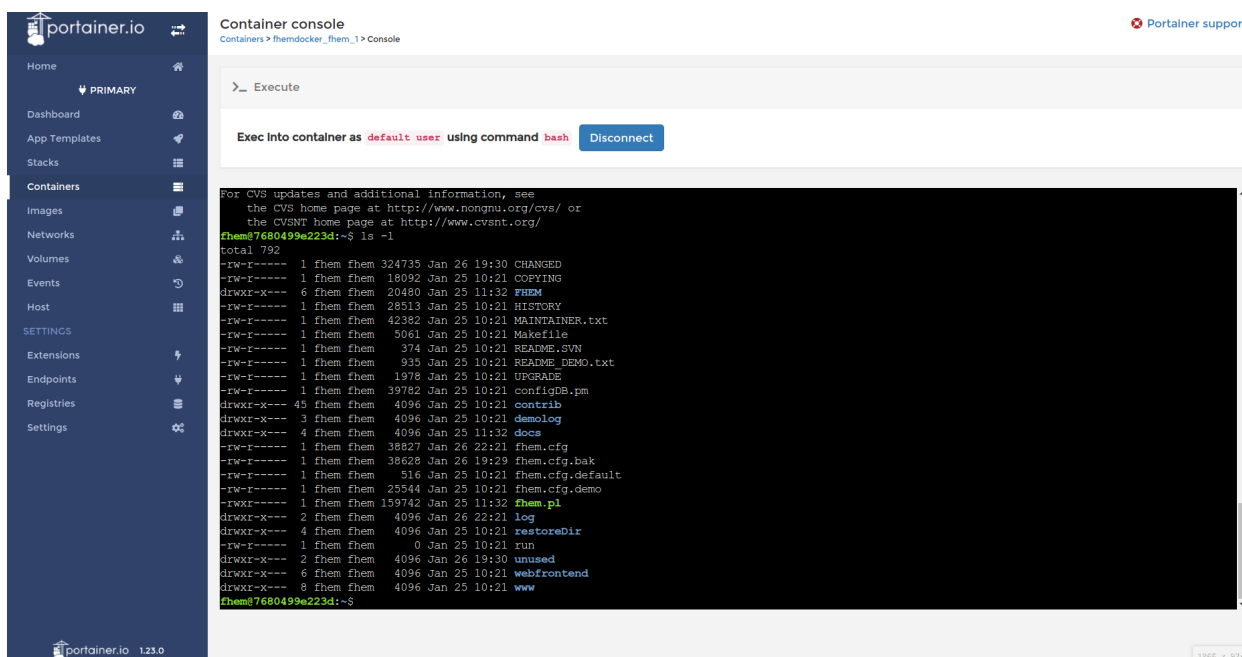


Abbildung 5: "portainer"

<http://localhost:9000>



## Deconz

deCONZ Image Container Integration

## Configuring Raspbian for RaspBee

Raspbian defaults Bluetooth to `/dev/ttyAMA0` and configures a login shell over serial (tty). You must disable the tty login shell and enable the serial port hardware, and swap Bluetooth to `/dev/S0`, to allow RaspBee to work properly under Docker.

To disable the login shell over serial and enable the serial port hardware:

- 1) `sudo raspi-config`
- 2) Select Interfacing Options
- 3) Select Serial
- 4) “Would you like a login shell to be accessible over serial?” Select No
- 5) “Would you like the serial port hardware to be enabled?” Select Yes
- 6) Exit `raspi-config` and reboot To swap Bluetooth to `/dev/S0` (moving RaspBee to `/dev/ttyAMA0`), run the following command and then reboot:

```
echo 'dtoverlay=miniuart-bt' | sudo tee -a /boot/config.txt
```

This will exchange the UART and the Mini-UART so the Mini-UART is connected to the bluetooth and the UART to the GPIO pins.

On Raspberry Pi 4 verify that file `/boot/config.txt` does NOT contain a line “`enable_uart=0`”. If the line exists remove or comment (#) this line.

After running the above command and rebooting, RaspBee should be available at `/dev/ttyAMA0`.

## Watchtower

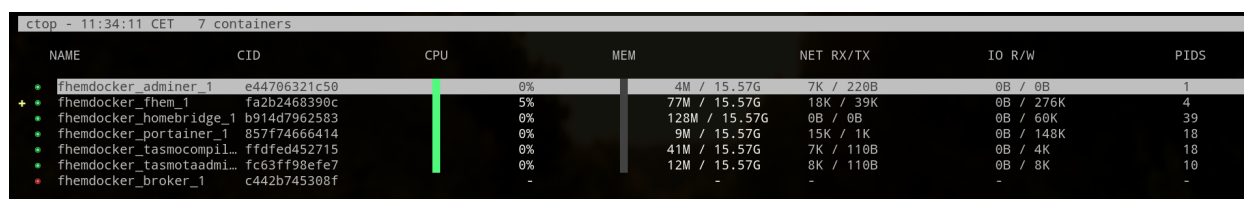
This container automatically update all running container within a given time interval.

<https://containrrr.github.io/watchtower/>

## ctop

### Description

ctop is a commandline monitoring tool for linux containers



NAME	CID	CPU	MEM	NET RX/TX	IO R/W	PIDS
fhemdocker_adminer_1	e44706321c50	0%	4M / 15.57G	7K / 220B	0B / 0B	1
fhemdocker_fhem_1	fa2b2468390c	5%	77M / 15.57G	18K / 39K	0B / 276K	4
fhemdocker_homebridge_1	b914d7962583	0%	128M / 15.57G	0B / 0B	0B / 60K	39
fhemdocker_portainer_1	857f74666414	0%	9M / 15.57G	15K / 1K	0B / 148K	18
fhemdocker_tasmocompil...	ffdfed452715	0%	41M / 15.57G	7K / 110B	0B / 4K	18
fhemdocker_tasmotaadmi...	fc63ff98efe7	0%	12M / 15.57G	8K / 110B	0B / 8K	10
fhemdocker_broker_1	c442b745308f	-	-	-	-	-

Abbildung 6: “ctop”

### Installation

ctop is available in AUR, so you can install it using AUR helpers, such as YaY, in Arch Linux and its variants such as Antergos and Manjaro Linux.

### Installation Linux

#### x86 Platform

```
sudo wget https://github.com/bcicen/ctop/releases/download/v0.7.5/ctop-0.7.5-linux-amd64 -O /usr/local/bin/ctop
sudo chmod +x /usr/local/bin/ctop
```

#### arm Platform

```
sudo wget https://github.com/bcicen/ctop/releases/download/v0.7.5/ctop-0.7.5-linux-arm -O /usr/local/bin/ctop
sudo chmod +x /usr/local/bin/ctop
```

### Known Issues

#### FHEM website not reachable

“Error nginx”

If you're not able to login. Please check the permissions of the .htpasswd file in

```
./fhemdocker/reverseproxy/config/.htpasswd
```

Set the right to 644 with

```
chmod 644 ./fhemdocker/reverseproxy/config/.htpasswd
```

## **Accessing the docker container via remote**

If you want to commit a FHEM command via the local telnet daemon you can use the script fcmd.sh. Note: Please change the hostname accordingly.

```
Username: pi
```

```
Hostname: raspberrypi4 (replace it with your hostname)
```

```
fcmd.sh <FHEM Command>
```

## **Contributing to fhemdocker**

Contributions are encouraged and welcome!