

Installing Direwolf on Pi-Star Digital Radio Gateway

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Note: due to limited space, we need to:

- Delete unneeded applications
- Use a USB flash disk as temporary space

If using 32GB or bigger MicroSD, skip to #7

1. Use putty to ssh login to hostname *pi-star*
2. Login: pi-star / raspberry
3. Update & Upgrade

```
rpi-rw (change to read-write mode)
sudo apt-get update
sudo apt-get -y upgrade
```

4. Uninstall apps and purge system

```
sudo apt-get purge samba samba-common nfs-common usb-mode*
sudo apt-get --purge autoremove
```

5. To clean

```
sudo bash -c "apt-get update && apt-get -y upgrade && apt-get -y autoremove && apt-get -y clean"
```

6. Mount a USB flash disk

```
sudo fdisk -l          (to find the partition name)
sudo fdisk /dev/sda    (change to 83 / Linux)
sudo mkfs.ext4 /dev/sda1
sudo mkdir /media/usb
sudo tune2fs -O ^metadata_csum /dev/sdb1      (remove protection)
sudo mount /dev/sda1 /media/usb
sudo chmod ugo+rw /media/usb
```

7. Build newer cmake

```
cd /media/usb
sudo apt-get install -y cmake
wget https://cmake.org/files/v3.7/cmake-3.7.2.tar.gz
tar xvfz cmake<tab>
cd cmake
cmake .          (perlu sekitar 30 menit)
make             (perlu sekitar 1 jam)
sudo make install
```

8. Install SDR support

```
# Update package index and install dependencies
sudo apt-get install -y build-essential pkg-config zlib1g-dev libusb-1.0-0-dev
```



```
# Download, compile, and install librtlsdr
git clone https://github.com/steve-m/librtlsdr.git
cd librtlsdr
mkdir build
cd build
cmake -DCMAKE_INSTALL_PREFIX:PATH=/usr -DINSTALL_UDEV_RULES=ON ..
sudo make -j2 install

# Load udev rules and blacklist the DVB driver shipped with the OS
sudo cp ../rtl-sdr.rules /etc/udev/rules.d/
sudo ldconfig

# the following 2 lines is actually single continuous line
echo 'blacklist dvb_usb_rtl28xxu' | sudo tee --append /etc/modprobe.d/blacklist-dvb_usb_rtl28xxu.conf

# add these (required for Orange Pi board)
sudo vi /etc/modprobe.d/rtl-sdr-blacklist.conf
blacklist dvb_usb_rtl28xxu
blacklist dvb_usb_rtl2832u

sudo reboot
# cabut UFD dan ganti SDR dongle

# dongle test
dmesg          (lihat terbaca)
rtl_test      (should not show "Failed to open rtlsdr ...")
```

9. Install direwolf

```
sudo apt-get install -y libasound2-dev libudev-dev tmux (removed:
alsa-lib-devel)
cd /media/usb
git clone https://www.github.com/wb2osz/direwolf
cd direwolf
mkdir build && cd build
cmake ..
make -j4
sudo make install
```

10. Configure direwolf

a. Setup untuk SDR

```
cd
vi dw-sdr.conf
```

```
# untuk RTL-SDR dongle
ADEVICE null null
MYCALL YD0NXX-4          # ganti dengan callsign kalian
IGSERVER asia.aprs2.net
IGLOGIN YD0NXX-4 passcode # put your APRS passcode here

# do not insert these callsigns, untuk mencegah direct dari local
# stn
FILTER 0 IG !b/YD0NXX/YE0EEE-*/YC1SCC/YD0AVJ/YC0OSU

# beacon on the internet
# PBEACON sendto=IG delay=0:30 every=60:00 comment="SDR Gateway on
Pi-Star" symbol="igate" overlay=R lat=06^15.52S long=106^46.75E
```

b. Script for sdr start

```
vi sdr-start.sh
#!/bin/bash
/usr/bin/rtl_fm -f 144.39M -p 0 -0 - | /usr/local/bin/direwolf -c
/home/pi-star/dw-sdr.conf -r 24000
```

c. Setup tmux for auto start

```
sudo apt-get install -y tmux
```

Create `/etc/systemd/system/direwolf.service`

```
sudo nano /etc/systemd/system/direwolf.service
```

```
[Unit]
Description=Direwolf
After=network.target

[Service]
Type=forking
#The following is one line
#Modify the end of the line below to fit your own needs i.e path to
your configuration file
ExecStart=/usr/bin/tmux new-session -d -s direwolf '/home/pi-star/
sdr-start.sh'
Restart=always

[Install]
WantedBy=default.target
```

d. Enable system

```
sudo systemctl enable direwolf.service
```

e. Start service

```
sudo systemctl start direwolf.service
```

f. Monitor direwolf session

```
sudo tmux attach -t direwolf
```

References:

Pi-Star:

<https://amateurradionotes.com/pi-star.htm>

<https://www.pistar.uk/>

Trim apps:

RTL-SDR Blacklisting:

<https://photobyte.org/using-the-raspberry-pi-as-an-rtl-sdr-dongle-server/>

<https://www.rtl-sdr.com/tag/install-guide/> (bug on orange-pi)

Revisions: 7 June, 27 July 2023