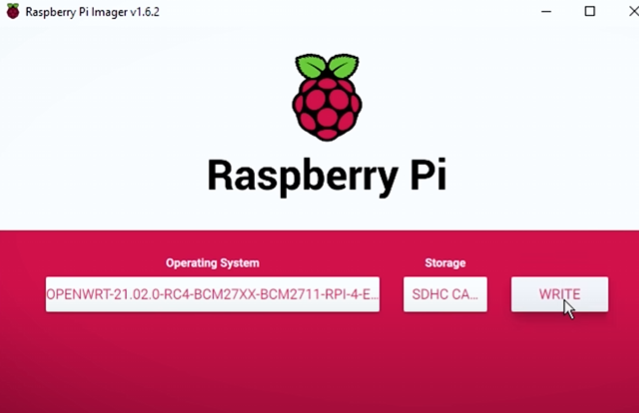
Raspberry Pi Travel VPN Router Documentation

First step – Installing OpenWRT

1. Download firmware on PC and provide SD card with SD card reader into PC

Download location for firmware can be found here: <https://firmware-selector.openwrt.org/?version=SNAPSHOT&target=bcm27xx%2Fbcm2712&id=rpi-5>

1. Download Raspberry Pi Imager to PC and select OPENWRT as Operating System and SD as storage device and hit write
2. Connect SD Card, Power cable and ethernet cable to Raspberry PI (ethernet cable from PC to Raspberry PI)
3. SSH into Raspberry Pi from PC. The default IP address for a new Raspberry Pi will be 192.168.1.1 (ssh [root@192.168.1.1](mailto:root@192.168.1.1) on Windows) This should present a OPENWRT screen on success. If unable to connect ensure your PC is on a proper subnet to reach the Pi’s IP
4. Password should be set once successfully connected by using the passwd command
5. At this point configuration changes will be set to the following locations: wireless / network / firewall. These are located in the config directory (cd /etc/config) this will be edited with the vi command (vi network). Apply the changes below.
6. In network file Under config interface ‘lan’ : change option ipaddr to a private IP address

Add option force\_link ‘1” at the bottom of config interface ‘lan’

Add the following below as a new interface separate from ‘lan’

Config interface ‘wwan’

Option proto ‘dhcp’

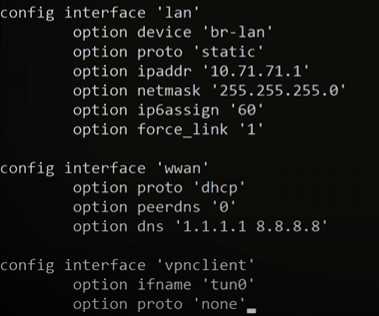
Option peerdns ‘0’

Option dns ‘8.8.8.8’

Config interface ‘vpnclient’

Option ifname ‘tun0’

Option proto ‘none’



Be sure to save by hitting escape key typing :wq and hitting enter

1. Vi firewall and navigate to config zone edit option input to ACCEPT and save with wq
2. Reboot Raspberry Pi and ensure PC in configured for DHCP (obtain IP address automatically in ethernet properties for windows)
3. SSH back into Raspberry Pi with private IP address and password set earlier
4. Use command vi wireless – add the following configurations below

Option channel ‘7’

Option hwmode ‘11g’

Option htmode ‘HT20’

Option disabled ‘0’

Add the following line into config wifi-device ‘radio0’ : option short\_gi\_40 ‘0’ and save with :wq

1. Run the following commands – uci commit wireless and wifi

Verify your device is broadcasting a SSID, it should appear as OPENWRT

Second Step – Connecting OPENWRT to WiFi

1. Navigate to OPENWRT GUI by typing the IP address you set earlier into your browser on your PC. Login with password set earlier
2. Navigate to Network at the top then Wireless
3. Scan for networks under radio0 and select your WiFi network
4. Check Replace Wireless Configuration and enter your WiFi password in WPA box and submit and then save & apply and reboot Raspberry Pi

Third Step – Setting up physical WiFI Adapter for user connection

1. SSH back in and run opkg update command
2. Run command: opkg install kmod-rt2800-lib kmod-rt2800-usb kmod-rt2x00-lib kmod-rt2x00-usb kmod-usb-core kmod-usb-uhci kmod-usb-ohci kmod-usb2 usbutils openvpn-openssl luci-app-openvpn nano
3. Plug in physical USB WiFi adapter into Raspberry Pi

To verify the device is being detected you can run the lsusb command

1. Run command ifconfig wlan1 up
2. Run command nano /etc/config/wireless and change the following

Option disabled ‘0’

Option ssid to preferred name

Option encryption ‘psk2’

Add new line: option key ‘your preferred wireless key here’ as a new line under option encryption

Ctrl X / CTRL Y / ENTER to save

1. Run command: uci commit wireless
2. Run command wifi

At this point you will be able to join the created SSID over your devices

Fourth Step – Adding VPN integration

In this step we will be adding VPN for traffic encryption, we will be using NordVPN which requires a paid subscription

1. Navigate to <https://nordvpn.com/servers/tools/> and you will be recommended a server ensure that you are not currently connected to VPN while searching and to have the proper server location is selected for you under recommended
2. Clink on show available protocols and download the OpenVPN UDP config
3. Upload file from PC location to Raspberry Pi via scp command in SSH below

Scp us5862.nordvpn.com.udp.ovpn [root@10.71.71.1](mailto:root@10.71.71.1): /etc/openvpn/client.conf

1. Now we must apply configuration changes to our Raspberry PI via CLI. Enter the commands below after adding your Username (NordVPN email) and NordVPN password in the OVPN fields below

opkg update

opkginstall luci-app-openvpn

/etc/init.d/rpcd restart

OVPN\_DIR="/etc/openvpn"

OVPN\_ID="client"

OVPN\_USER="USERNAME"

OVPN\_PASS="PASSWORD"

The script below should be pasted as one

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umask go=

cat << EOF >${OVPN\_DIR}/${OVPN\_ID}.auth

${OVPN\_USER}

${OVPN\_PASS}

EOF

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The script below should be pasted as one

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sed -i -e "

/^auth-user-pass/s/^/#/

\$a auth-user-pass ${OVPN\_ID}.auth

/^redirect-gateway/s/^/#/

\$a redirect-gateway def1 ipv6

" ${OVPN\_DIR}/${OVPN\_ID}.conf

/etc/init.d/openvpn restart

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The script below should be pasted as one

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ls /etc/openvpn/\*.conf \

| while read -r OVPN\_CONF

do

OVPN\_ID="$(basename ${OVPN\_CONF%.\*} | sed -e "s/\W/\_/g")"

uci -q delete openvpn.${OVPN\_ID}

uci set openvpn.${OVPN\_ID}="openvpn"

uci set openvpn.${OVPN\_ID}.enabled="1"

uci set openvpn.${OVPN\_ID}.config="${OVPN\_CONF}"

done

uci commit openvpn

/etc/init.d/openvpn restart

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The script below should be pasted as one

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uci rename firewall.@zone[0]="lan"

uci rename firewall.@zone[1]="wan"

uci del\_list firewall.wan.device="tun+"

uci add\_list firewall.wan.device="tun+"

uci commit firewall

/etc/init.d/firewall restart

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The script below should be pasted as one

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mkdir -p /etc/hotplug.d/online

cat << "EOF" > /etc/hotplug.d/online/00-openvpn

/etc/init.d/openvpn restart

EOF

cat << "EOF" >> /etc/sysupgrade.conf

/etc/hotplug.d/online/00-openvpn

EOF