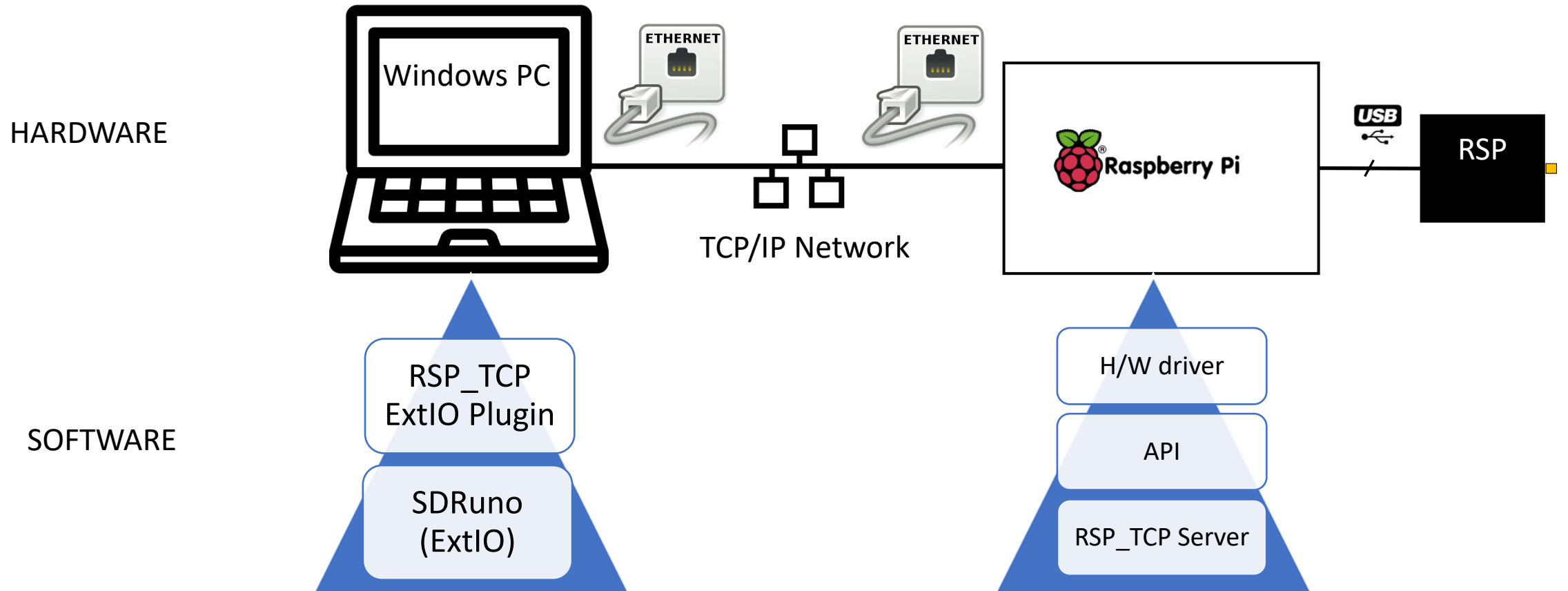


*Using the full version of SDRUno  
with the RSP connected to a  
remote Raspberry Pi or other  
computing platform*

23<sup>rd</sup> August 2020



# Current Approach - RSP\_TCP Server



# RSP\_TCP server approach Pros/Cons

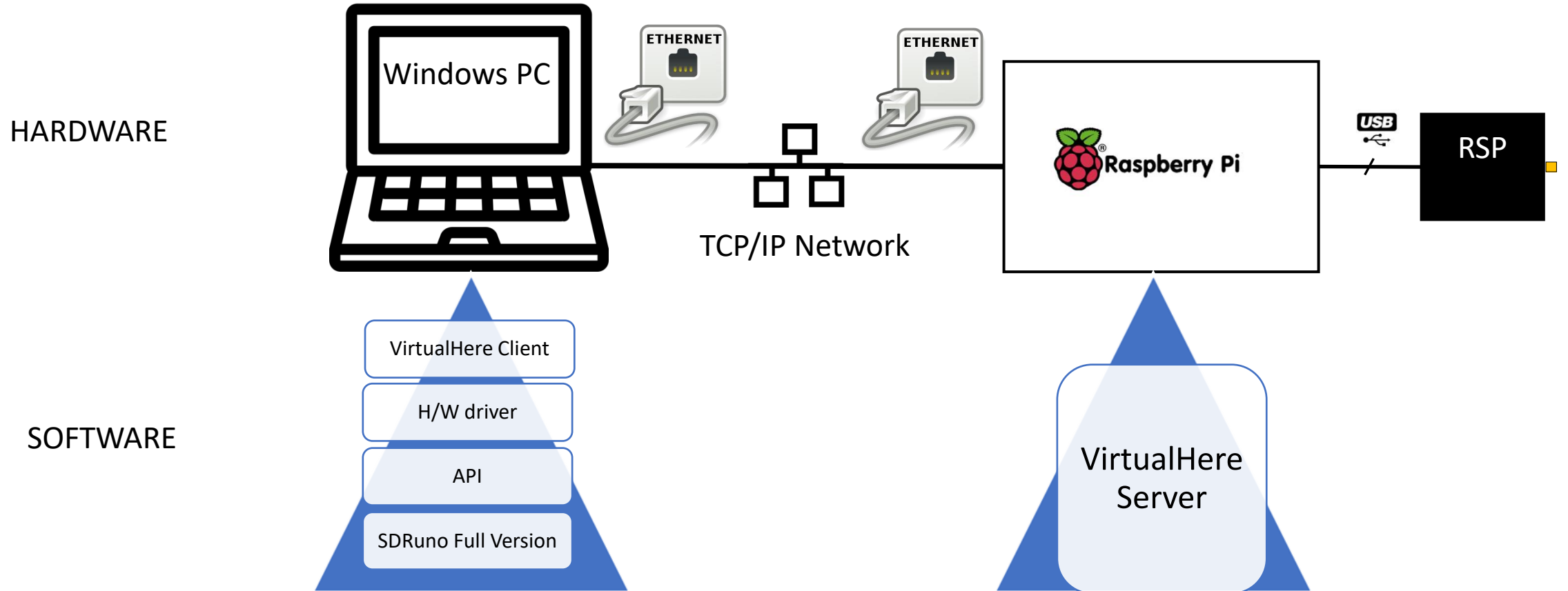
## PROs

- Works on both LANs and WANs
  - The server can apply decimation to limit the data rate across the network

## CONs

- You can only use the ExtIO version of SDRuno
  - Constrained functionality when compared to the full version of SDRuno
    - The full version of SDRuno has no TCP/IP client at present
- Dual tuner operation with the RSPduo not possible

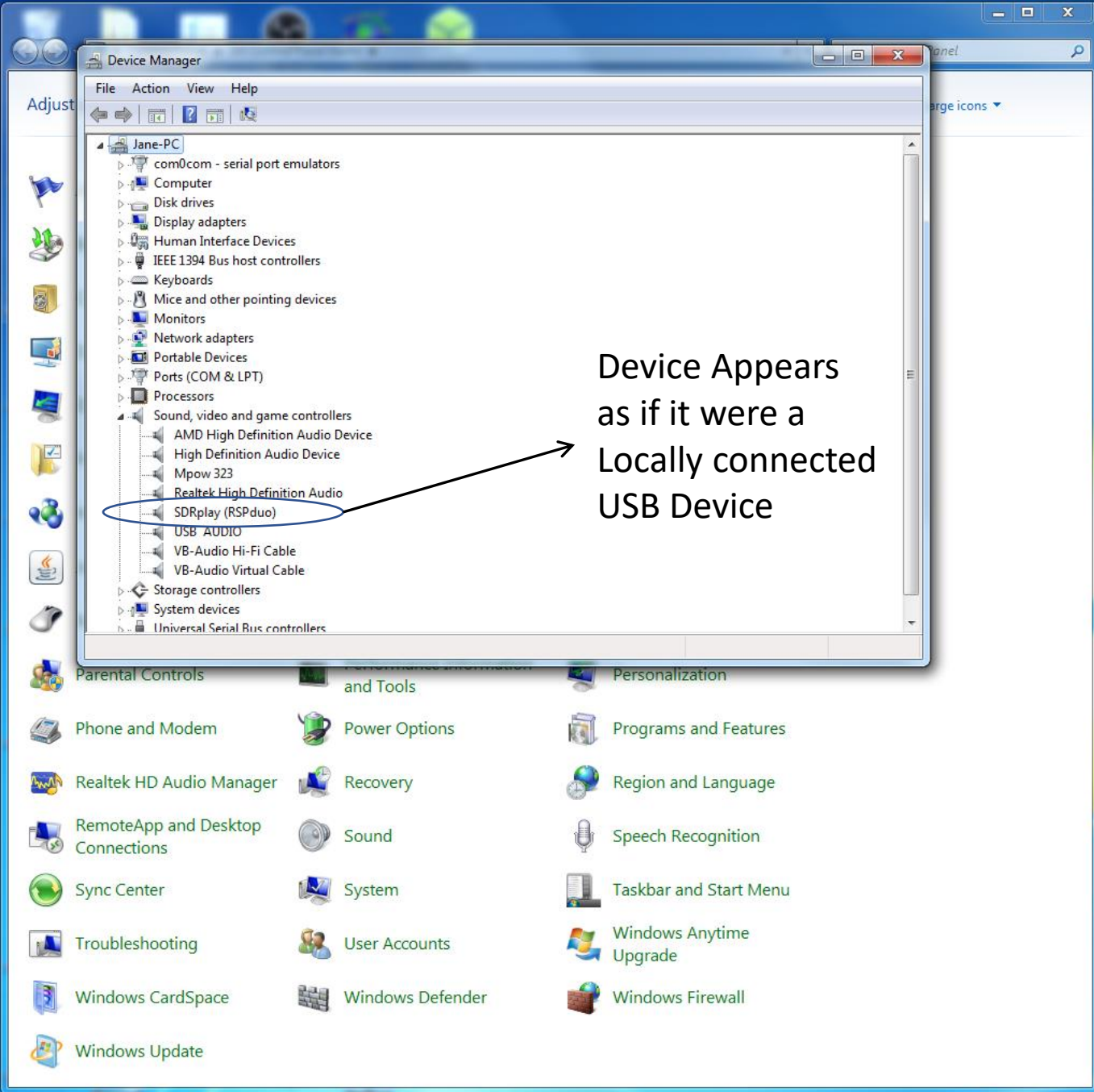
# Alternative Approach



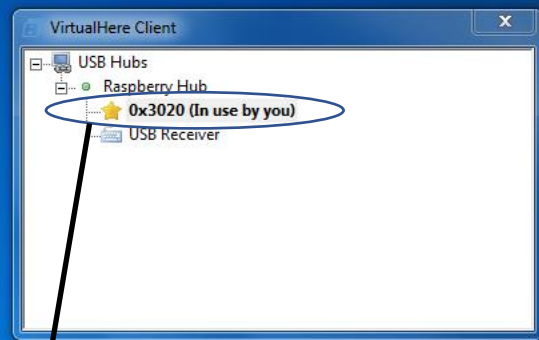
# What is Virtualhere?

- VirtualHere is a server/client software package that converts a network connected USB device on a remote computing platform into a 'Virtual USB Cable' connected device
  - <https://www.virtualhere.com/>
- The server software operates on virtually any remote computing platform
  - Linux
  - MacOS
  - Raspberry Pi OS (we recommend RPi4)
  - Windows
- With the client running on the Windows PC, the device appears as a local USB connected device in the Windows Device Manager
- Client software is free
- There are both free and paid for versions of the server software





Device Appears as if it were a Locally connected USB Device



3020 is the PID for a RSPduo

- Start the Client software and select the remote device that you wish to use
- Having started the client, the RSP will appear in the Device Manager
- Start SDRuno and use normally!



SDRuno MAIN V1.40.S Final SR: 2000000 Gain: 67.2dB

OPT SCANNER REC PANEL RSPduo MODE SINGLE IFBW: 1.536MHz (LIF)

TUNER 1 HI Z 50 ohm NOTCHES MW/FM DAB

TUNER 2 BIAS-T 50 ohm IF MODE LIF RF GAIN

USB: BULK Sdr: 11% Sys: 44%

DEEM 50u STEP: 100 kHz 93.300000 -88.5 dBm

MODE AM SAM FM CW DSB LSB USB DIGITAL

VFO A A > B NFM MFM CWPK 60K 80K NBW NCH1

VFO B B > A WFM SWFM ZAP 120K 192K NBN NCH2

QMS QMR STEREO RDS CWAFK NR NBOFF NCH3

MUTE -91 dBm AGC OFF FAST NCH4

SQLC VOLUME

AudioRecorder DAB DXCluster

Unload All Plugins Load Plugins

Span 192 kHz FFT 620 Pts RBW 154.84 Hz Marks 2000 Hz

SCHEDULER CONFIG SDRuno RECORDER

SCANNER CONFIG ADD LOCKOUT SDRuno SCANNER

STORE SDRuno MEM. PANEL

Air Band Exclusion Lis	Frequency	S	Mode	Description
Air Band.s1b	88900000	Y	FM	BBC Radio 2 FM
ALERT new.s1b	91100000	Y	FM	BBC Wales
DSC.s1b	91300000	Y	FM	
Ignore List.s1b	91500000	Y	FM	
IT65.s1b	91500000	Y	FM	
LAFD3.s1b	93300000	Y	FM	BBC Radio 4
MW AM band.s1b	93500000	Y	FM	
RSP1A VHF Air with ex	98500000	Y	FM	BBC Radio 1 FM
Scan.s1b	98700000	Y	FM	
SIMON MW TEST 22.0	100100000	Y	FM	Classic FM
VHF Air Band.s1b	100700000	Y	FM	Classic FM
VHF FM RSPdx.s1b	100900000	Y	FM	Today FM
VHF FM.s1b	104300000	Y	FM	Radio Cymru
VHF Marine Band.s1b	105700000	Y	FM	
VHF Pagers.s1b	106900000	Y	FM	

SDRuno AUDIO REC

Folder: C:\Users\Simon\Documents

File:

Size: 0 MB VRX: 0

Duration: 00:00:00

Recording format: MP3

Select folder Start Recording

SDRuno MAIN SP

SETT. PWR & SNR TO CSV

-88.5 dBm SNR: 22.4 dB

93.300000

Span 2000 kHz FFT 8192 Pts RBW 244.14 Hz Marks 10 kHz

FM Mode Selected

23/08/2020 14:25:55

SDRuno operates as normal with full functionality as if the RSP was locally connected, despite it being actually connected to a remote Raspberry Pi

# VirtualHere Pros/Cons

## PROs (lots actually)

- Allows full functionality for SDRuno as if the device were locally connected
  - Scanning
  - Plugins
  - HDR mode for the RSPdx
  - Band framing etc
- Is very 'light' on the server side
  - All processing (including the API) is local to the client machine
- Works across different server operating systems
- Free for single device
- Even allows dual tuner operation with a remote RSPduo
- No RSP specific software needs to be installed on the server

## CONs (very few)

- Only really suitable for wired LANs
  - No decimation possible on server and so minimum sample rate is achieved with 2 MHz, ZIF mode
    - Minimum raw data throughput is  $2 \times 14 \times 2 \text{ MHz} = 56 \text{ Mbits/s}$
    - Maximum raw data rate is  $2 \times 14 \times 6 \text{ MHz} = 168 \text{ Mbits/s}$ 
      - With 'overhead' this will be more than **200 Mbits/s**
- With the Raspberry Pi as a server, you **MUST** select bulk transfer mode in SDRuno **BEFORE** pressing PLAY!
  - The Raspberry Pi does NOT support the SDRuno default isochronous mode
  - If you don't the client PC WILL crash!! - you have been warned
  - Release 1.40.1 has added support for BULK transfer mode in the Main Panel Settings



# RSP PID (Product ID) Codes

- 0x2500 – RSP1
- 0x3000 – RSP1A
- 0x3010 – RSP2/RSP2pro
- 0x3020 – RSPduo
- 0x3030 – RSPdx



# Headless Server Setup

- Move the server software from Downloads to /usr/sbin
  - `sudo mv vhusbdarm /usr/sbin`
- Create service file (/etc/systemd/system/virtualhere.service)
  - [Unit]
  - Description=VirtualHere USB Sharing
  - Requires=networking.service
  - After=networking.service
  - [Service]
  - ExecStartPre=/bin/sh -c 'logger VirtualHere settling...;sleep 1s;logger VirtualHere settled'
  - ExecStart=/usr/sbin/vhusbdarm
  - Type=idle
  - [Install]
  - WantedBy=multi-user.target
- Load the service
  - `sudo systemctl daemon-reload`
  - `sudo systemctl enable virtualhere`
  - `sudo systemctl start virtualhere`

