

RCForb Server Without Opening Ports!

Applications for Internet Hotspots, Cell Phones, and Starlink Satellite-Based Internet

Introduction

We just successfully configured, installed, and are now using the first *RCForb Server* connection using a cellphone carrier/hotspot. This included wired and Wi-Fi connections with the server synchronized and published in the directory of RemoteHams servers. The same approach works with cellphone-based Internet hotspots.

Background

Let me first provide you with some background on my search for Internet for *RCForb Server* and costs. I live in a somewhat rural area where the only high-speed Internet available with port forwarding was DSL (3 Mbps down bit rate). This worked but not well.

I eventually found a way to increase my speed by purchasing a MOFI4500 router (price class, \$300) and an AT&T SIM card from the company *Free Packet LCC* for \$160 per month with a 1 TB data download limitation and *MOFI Cloud* from Canada where I could port forward through them and establish my link. This has worked satisfactorily despite the relatively slow 12 Mbps download speed and yearly cost of \$1900 for Internet which we also used for the whole house.

I also applied for the *Starlink* satellite-based, Internet system which I felt would be my best future Internet service, costing about \$1200 per year. However, it is questionable whether it could be successfully used with *RCForb Server* because, like other services, *Starlink* doesn't allow port forwarding. I continued searching for solutions and happened upon the *T-Mobile 5G Home*. It is a hotspot device with 2 ethernet ports. Surprisingly, for \$50 per month and with an unthrottled data rate and unlimited data usage, I am consistently getting 500 Mbps download rates. However, this did not solve my port forwarding problem.

I became even more motivated and researched ways that port forwarding could be done on cell tower services. After a month of research and help from Marc, WA6HBR and Gene, K5PA we hit pay dirt. I also contacted Roger, W8RJ (a creator/developer for RemoteHams) to test the system and he agreed it is the first solution to this problem he has seen. So how did we do it?

Implementation

As a Psychologist (retired) by profession, I will attempt to put this concept in my layman's terms. I located an Internet tunneling service, like *MOFI Cloud*, that could open ports at another location. In this case, it opens ports and sets up a secure data tunnel between my *RCForb Server* computer, my cell phone service provider *T-Mobile* and the secure *Hoppy Network* connection in Chicago.

You can sign-up for this service at <https://hoppy.network>. The cost of the service (in Dec. 2021) is \$8 a month and you are allowed to transfer up to 1 TB of data per month.

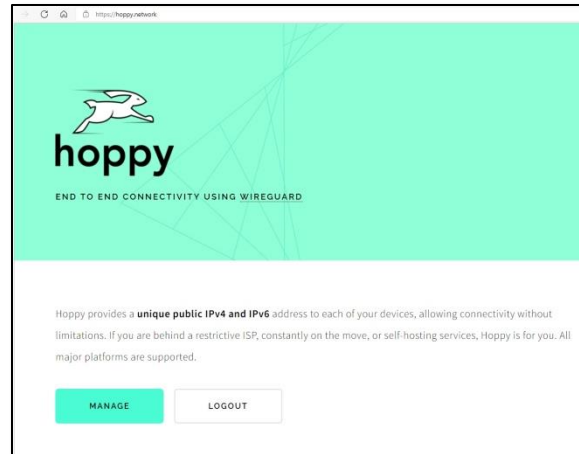


Figure 1. The Hoppy Service with *WireGuard*

You also need to download *WireGuard* from <http://www.wireguard.com> (a free program) that is used to provide the secured connection and can turn the system on and off.

You also need to configure your computer's firewall, in my case Microsoft's Defender, to allow ports 4524 and 4525 to pass through to the *RCForb Server* program. I did this for my *RCForb Servers* configured with both my *T-Mobile 5G Home* and a hotspot using my AT&T cell phone service and they both worked great. Just imagine, you can be at a remote cabin, a mountain top with cell service or use *Starlink* and your RemoteHams Server can still setup a link!

Step-by-Step Instructions

Here's how you can set this same service up and test it yourself.

- 1) Go to the Hoppy website at <https://hoppy.network> and sign-up for their service.
- 2) Next, create a new interface. You will then see a button that will provide a configure template.
- 3) Copy the script in the template.
- 4) Next, run *WireGuard*.
- 5) In *WireGuard*, click on the bottom left, add a tunnel.
- 6) In the blank area, paste the hoppy.network script from step #3 above.
- 7) In the script, under Interface and address, add in the DNS setting: 8.8.8.8, 8.8.4.4 (Google DNS server IP addresses) and save the script.
- 8) Activate the button on the *WireGuard* and you will be automatically connected to your Internet and the Hoppy service.

```
[Interface]
PrivateKey = <replace_private_key_here>

# Recommended to use an IPv6 address that ends in ::1 or higher
Address = [REDACTED]

# macOS/iOS requires a working DNS Server, optional for Linux (requires resolvconf)
# DNS = 1.1.1.1, [REDACTED]

[Peer]
PublicKey = [REDACTED]
Endpoint = [REDACTED]

# IPv6 Endpoint
# Endpoint = [REDACTED]

# Dual IPv4/IPv6 Endpoint
# Endpoint = [REDACTED]

AllowedIPs = 0.0.0.0/0, ::/0
PersistentKeepalive = 55
```

Figure 2. Setting Up the Hoppy Service (my parameters are redacted, yours will be shown)

It will show both Internet access connections on your computer. My experience is that the speed and latency of the Internet connection is almost unnoticeable when I am connected.

Adjust Your Firewall on the RCForb Server's Host Computer

My computer uses the Microsoft Windows 10 O/S and I use the *Defender* firewall. Your firewall needs to be configured to allow the *RCForb Server* ports to pass through the firewall to the program. Here are the steps needed.

Step-by-Step to for Window Defender Firewall (shown in Figure 3).

- 1) Go to Windows Security > Firewall and Network > Protection > Advanced Settings > InBound Rules
- 2) (On the right side) New Rule > Port > TCP > Specific Local Ports add 4524-4525 (or the two addresses identified for the RCForb Server program, see Figure 4)
- 3) Allow connection > Public > Name and Finish.
- 4) You can name this RCForb or something similar but do delete other listing in the inbound with RCForb.

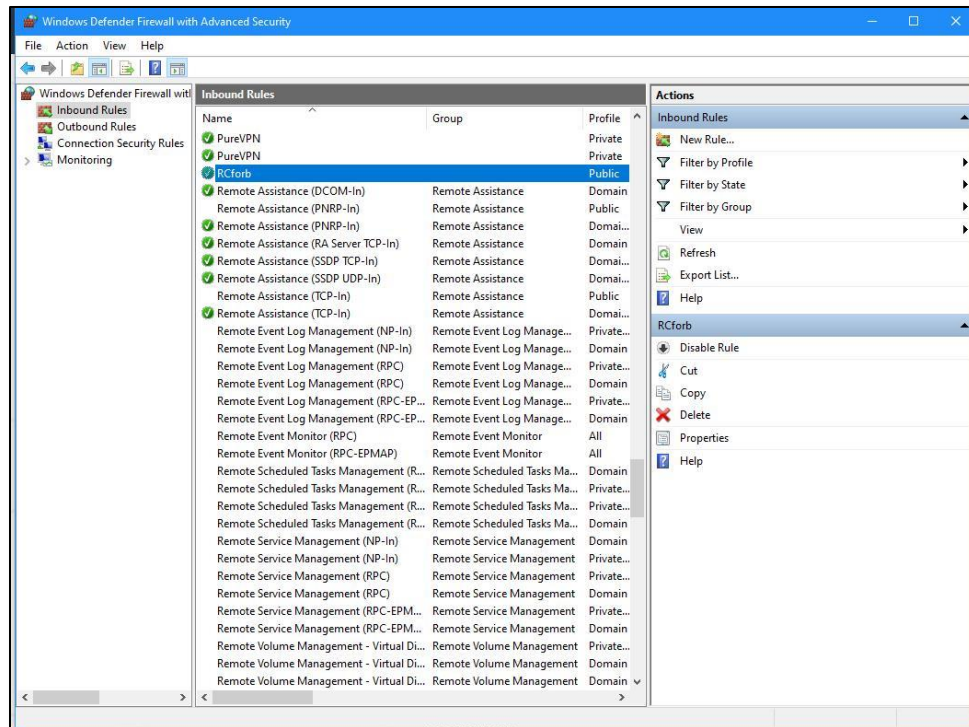


Figure 3 Defender Firewall Adjustments

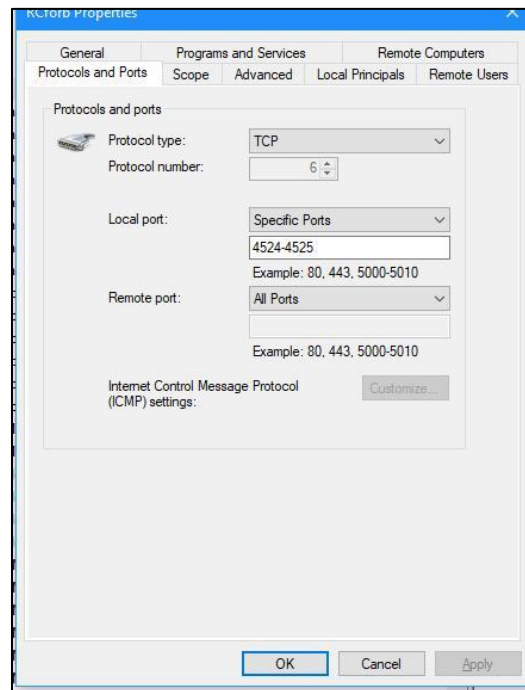


Figure 4 TCP Port Properties Adjustments in Defender

Figure 5 shows the *WireGuard* GUI after you push the activate button.

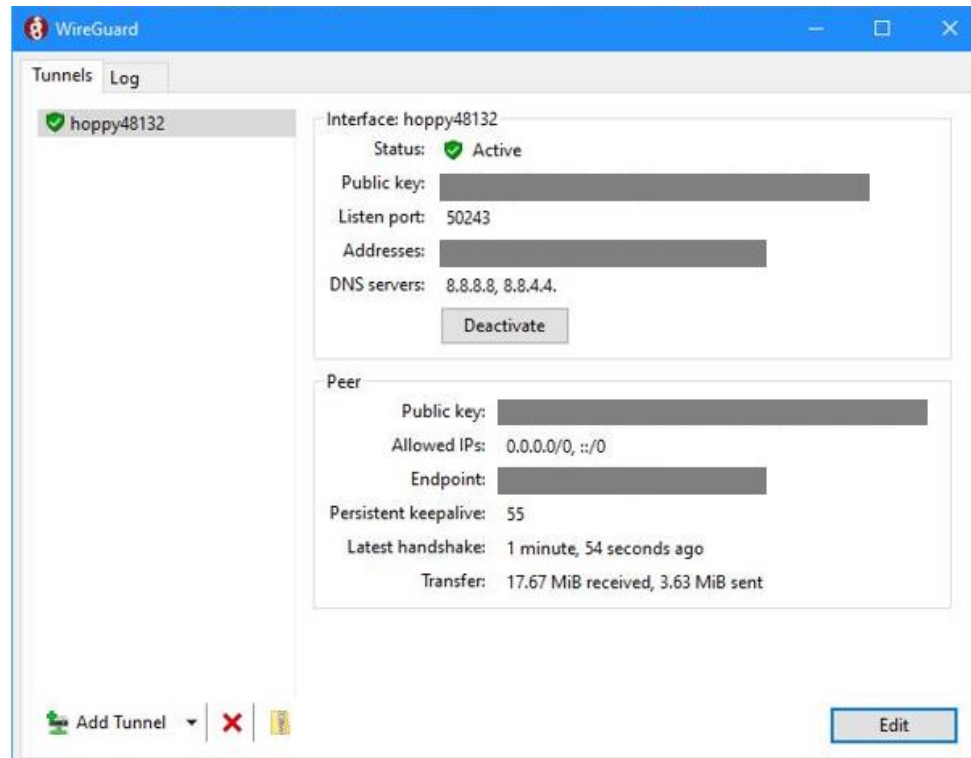


Figure 5. *WireGuard* GUI Once Activated

Summary and Credits

This solution hopefully solves *RCForb Server* connectivity through both *Starlink* satellite Internet and land-based cellular carriers. It will expand the horizons of *RemoteHams* users by letting them setup portable links on mountain tops and similar locations with Internet availability as well as in remote locations using satellite-based solutions like *Starlink*.

I would like to thank Marc, WA6HBR and Gene, K5PA for their assistance while investigating various methods and implementing this proven solution.

73, JIM, WB2REM

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Appendix 1 – System Architecture

