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# Tunneling

In order to setup a tunnel connection between two AREDN nodes, one node needs to act as the server, and the other as the client. See the current [list of tunnels](#) to know who to contact.

In this example, VA7FI-HAP-1 is the server and VE7RBE-HAP-1 is the client (and the details are made up):

## Server Side

On VA7FI-HAP-1's Tunnel Server page:

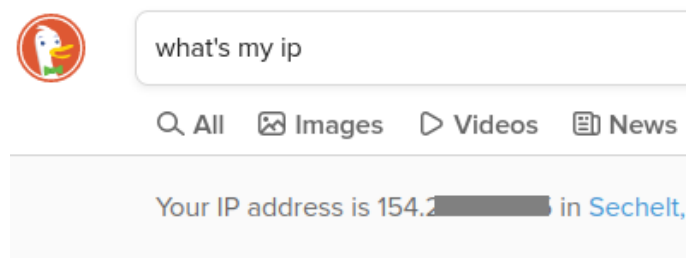
The screenshot shows a web interface for configuring a Tunnel Server. The top navigation bar includes links for Node Status, Basic Setup, Port Forwarding, DHCP, and Services, Tunnel Server (highlighted), Tunnel Client, Administration, and Advanced Configuration. Below the navigation are buttons for Help, Save Changes, Reset Values, and Refresh. The main configuration area has two input fields: Tunnel Server Network (172.31.39.164) and Tunnel Server DNS Name (VA7FI-HAP-1). Below this is a section titled "Allow the following clients to connect to this server:" containing a table with columns for Enabled?, Client, Pwd, Net, and Active Action.

Enabled?	Client	Pwd	Net	Active	Action
<input checked="" type="checkbox"/>	VE7RBE-HAP-1	password	172.31.39.164	<input type="checkbox"/>	<input type="checkbox"/>

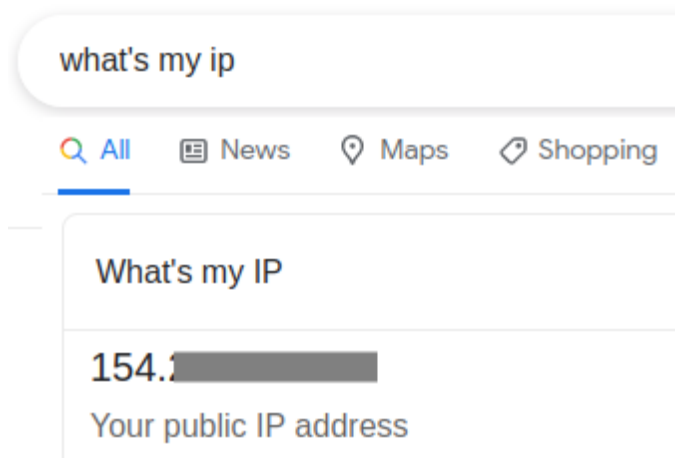
Contact Info/Comment (Optional): va7fi@rbox.me

- **Client:** VE7RBE - HAP - 1 is Robert's node name.
- **Pwd:** Create a unique password for that node.
- **Net:** 172.31.39.164 is automatically assigned by the hAP.
- Some optional contact info can be added.

In addition to this information, VA7FI's public IP address will also need to be given to VE7RBE. To find your public IP address quickly, you can simply search for "what's my ip" in your favourite search engine:



Search for "what's my ip" in [DuckDuckGo](#)



Search for “what's my ip” in [Google](#)

## Client Side

On [VE7RBE-HAP-1's Tunnel Client](#) page:

A screenshot of the Tunnel Client configuration page. The page has a navigation bar with links for "Node Status", "Basic Setup", "Port Forwarding, DHCP, and Services", "Tunnel Server", "Tunnel Client" (highlighted), "Administration", and "Advanced Configuration". Below the navigation bar, there are buttons for "Help", "Save Changes", "Reset Values", and "Refresh". The main content area is titled "Connect this node to the following servers:" and contains a table with columns for "Enabled?", "Server", "Pwd", "Network", and "Active Action". The table has one row with a checked "Enabled?" box, "Server" field containing "154.12.201.102", "Pwd" field containing "password", "Network" field containing "172.31.39.164", and "Active Action" field containing a cloud icon and a "Del" button. Below the table, there is a "Contact Info/Comment (Optional):" field containing "VA7FI@rbox.me".

- **Server:** 154.12.201.102 is VA7FI-HAP-1's public IP address
- **Pwd:** is the password created by VA7FI
- **Network:** 172.31.39.164 is the **Net** address automatically generated by VA7FI-HAP-1

## More About Public IP Addresses

Most residential internet services are given a single *dynamic* IP address, which means that the address can *change* every few days or so (or when the router power cycles). This means that when a server node suddenly gets a new public IP address, the client node can't find it anymore.

One solution is to use a [Dynamic\\_DNS](#) service like [No-IP](#). These services query your *dynamic* IP address, and translate it into a *static* hostname. It's that hostname that you then give the AREDN client (instead of your public IP address).

However, the No-IP service needs to be “told” when your dynamic IP address changes. This can be done by installing a small program that notifies them of the change, or alternatively, some routers have that

function already built in. For example, on my Telus T3200M router, I can enter my No-IP account information under:

[Advanced Setup](#) → Dynamic DNS

The screenshot shows the router's web interface. At the top, there is a navigation bar with five icons: Home (house), Status (heart rate), Wireless Setup (Wi-Fi), Firewall (fire), and Advanced Setup (wrench and screwdriver). The Advanced Setup icon is highlighted with a red box. Below the navigation bar is a sidebar menu with categories: Blocking/Filtering, IP Address, Security, Storage Service, and Modem Utilities. The 'Dynamic DNS' option under IP Address is highlighted with a red box. The main content area is titled 'Dynamic DNS' and contains the following configuration steps:

- 1. Set the dynamic DNS state.**  
Dynamic DNS State:  Enable  Disable
- 2. Select the dynamic DNS provider.**  
Dynamic DNS provider:
- 3. Enter your username and password.**  
Username:   
Password:
- 4. Enter the dynamic DNS host name.**  
Hostname:
- 5. Click Apply to save changes.**

With this setup, every time Telus gives me a new public IP address, the router notifies No-IP, which updates it so that `myfancyhostname.ddns.net` continues to point to my router. So using `myfancyhostname.ddns.net` instead of `154.12.201.102` as the Server address will ensure the connection continues when the IP address changes.

## Port Forwarding

On Telus, I had to forward port 5525 to my hAP. There are two steps to this.

## DHCP Reservation

Just like Telus gives me a *dynamic* IP address, my router gives my devices *dynamic* IP addresses as well. The first step is to force the router to always give the same IP address to the hAP. On the T3200M this is done in:

[Advanced Setup](#) → DHCP Reservation

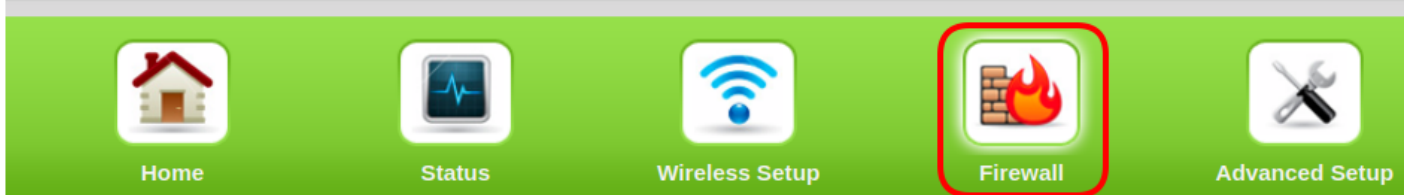
The screenshot shows the Mikrotik WinBox interface. At the top, there is a green navigation bar with icons for Home, Status, Wireless Setup, Firewall, and Advanced Setup. The Advanced Setup icon is highlighted with a red box. Below the navigation bar, the left sidebar contains a menu with categories: Blocking/Filtering, IP Address, and others. The DHCP Reservation option under IP Address is highlighted with a red box. The main content area is titled 'DHCP Reservation' and contains the following text: 'DHCP reservation leases a permanent DHCP allocated address to a client.' Below this, there are two sections: '1. Select MAC Address, or manually enter a MAC address.' and '2. Select an IP address to associate with a MAC address.' Each section has a dropdown menu for 'Manually enter the [MAC Address / IP address]' and a text input field for 'Manually Add [MAC Address / IP Address]'. At the bottom, there is a table with columns for MAC address, IP address, and a 'Remove' button. The table contains one entry: VA7FI-HAP-1, 08:5...27, 192.168.1.204.

- Select the MAC address of the hAP from the list
- Choose an IP address to assign it

## Port Forwarding

Now that the hAP's LAN IP address is fixed, we can forward a port to it:

[Firewall](#) → Port Forwarding



- Firewall
  - ▶ Firewall
  - ▶ IPv6 Firewall
  - ▶ **Port Forwarding**
  - ▶ Applications
  - ▶ DMZ Hosting
  - ▶ IPv6 DMZ Hosting
  - ▶ UPnP

### Port Forwarding

Enter ports or port ranges required to forward Internet applications to a LAN device below.

**1. Set the LAN/WAN port and IP information.**

Select LAN Device: Manually enter the IP address ▾

LAN IP Address:

External (WAN) Start Port:

External (WAN) End Port:

Internal (LAN) Start Port:

Internal (LAN) End Port:

Protocol: TCP ▾

**2. Click Apply to save changes.**

Apply

LAN START/ END PORT	PROTOCOL	LAN IP ADDRESS	WAN START/END PORT	MODIFY	REMOVE
5525/5525	TCP	192.168.1.204	5525/5525	<span style="background-color: #4CAF50; color: white; padding: 2px 5px; border-radius: 3px; cursor: pointer;">Modify</span>	<span style="background-color: #4CAF50; color: white; padding: 2px 5px; border-radius: 3px; cursor: pointer;">Remove</span>

- Select the hAP's IP address from the list
- Enter 5525 in all four Port fields
- Select TCP

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Permanent link:  
<https://wcairedn.ca/starting/tunneling/home>

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