

## How to double NAT two routers:

### Why would you want to do this?

- Increased security.
- The second router is behind the first connected from a LAN port on the first router to the WAN port on the second router. This means that devices on the LAN of the second router can access devices on the first router but not vice versa.
- If you connect both wireless and wired IoT devices to the first router and they are compromised they can't access your more secure devices which you have connected to the second router.
- Same goes if you need to segregate personal and business uses of an Internet connection. Put the less secure use/devices on the first router and what you want to keep more secure on the second router.
- Having two routers gives you more Wi-Fi radios to divide up traffic. (Having an AP will accomplish the same thing but just not with the security.)
- Your ISP/Modem router can't be put in a bridge mode.

### Why would you not want to do this?

- If you have the ability to create VLANs you would not need two routers to segregate traffic. It is more complicated if you want to segregate both wireless and wired clients using VLANs. VLANs are not possible using the ASUS standard or Merlin's modified OS through the GUI. It is fairly easy to create VLANs through the GUI on ASUS routers if you flash them with Tomato.
- Double NATing makes port forwarding more complicated as the port first has to be forwarded from the first router to the second router and then to the device on the second router's LAN.
- Setting up DNS to work on the second router will be difficult if not impossible depending on the second router's OS.
- Setting up a VPN server might be impossible on the second router. (In the newer releases of the Merlin derivative of the software for ASUS routers it can be done.) However you can with no problem run one or more VPN clients on the second router if that is something you want to do.

### Myths about double NAT.

- It slows your connection down. If both routers have gigabit LAN & WAN ports I doubt you will see a measurable difference in speeds.
- You need to put the second router in the first router's DMZ. Not necessary.

- Double NATing is bad because that is what everybody says. Try it and see for yourself. If some of the advantages are beneficial to your network's security and functionality then go for it. If you are proficient at writing scripts and modifying IP tables on your router do that instead.

## How to double NAT a router:

- On the first router(router 1 ) nothing needs to be changed unless you want to. This is the router where you want to connect your less secure devices either wired or wireless. I would suggest that on your first router you set up one or more guest networks and restrict them to Internet access only. (Block Intranet). The advantage of having one or more guest networks is that if a device connected by Wi-Fi gets hacked it can't easily affect other devices on this router's LAN. For the purpose of this example assume router 1's LAN IP is 192.168.1.1 and the DHCP pool it assigns IPs from is 192.168.1.100 -192.168.1.150.
- Plug one end of an Ethernet cable on to any LAN port on router 1. For now leave the other end unplugged.
- On router2 plug a second Ethernet cable in a LAN port and go to the administrative screens and make the following changes:
  - BACK UP THE SETTINGS ON ROUTER2 in case you want to revert it to the setup you had before double NATing the router.
  - On the WAN setup tell the router to get its WAN IP using automatic or DHCP. It will then be assigned a WAN IP by the first router in the range 192.168.1.100 – 150.
  - On the LAN setup pick another subnet for this router to use. For this example I picked the subnet 192.168.75.0/24. Give router2 the LAN IP of 192.168.75.1 and set the DHCP range to 192.168.75.100 192.168.75.150.
  - While you are in settings be sure to use different radio channels than router1.
  - Change the SSID and passwords for the radios on router2.
  - Save all the changes.
- Unplug the power to router2.
- Connect the cable from the LAN port on router1 to the WAN port on router2.
- Power up router2 and after it reboots run ipconfig on the computer connected to router2 and it should have an IP in the DHCP range of router2. If it doesn't reboot the computer connected to router2 to force it to get a new IP.
- If it still doesn't have an IP in the correct range then the simplest course of action is to do a factory reset on router2 and repeat the steps of the setup listed above in case there was some weird setting interfering with changing the subnet.
- Once you have router2 up and running as a router double NATed behind router1 you can fiddle with any of the other settings, such as static IPs , VPN Clients, QOS, etc. because now router2 is fully functional and the only difference between it and router1 is router2 has a private IP instead of a public IPV4 or IPV6 address.