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Manufacturer, Model, and Firmware of Network Devices.

Netgear Firewall FVS318Gv2, Firmware 4.3.5-3.

Comcast Cable Modem Netgear CG3000DCR, Firmware V3.01.08

Any differences in model or firmware version may affect your success with this process.

Comcast Cable Modem Configuration.

Since you cannot complete these tasks without being able to log into your cable modem, this document expects that you already know how to do this and the instructions for those steps are not included.

Upon logging in, click on the "LAN" button in the left-hand navigation panel. When that loads, click on the "IPv6 Setup" button at the top of the window. You should notice your IPv6 Prefix and IPv6 Address listings near the top of the window, you may want to make note of them.

Of all the boxes below the IPv6 Prefix, I have checked the following:

User defined prefix (accepted all default values)

Enable Rapid Commit

Enable Unicast

Enable DHCPv6

ALL other boxes are unchecked. Apply your settings and the cable modem will reboot to make the changes.

Netgear ProSafe FVS318Gv2 Firewall / Router Configuration.

It is expected that you know how to log into your FVS318Gv2 Firewall.

First thing on the list is to click on the "Network Configuration" link in the gold menu bar at the top of the page. Once this loads, the bottom box is labelled "Routing Mode". You should click the IPv4 / IPv6 mode radio button and "apply" the change. This will cause the FVS318Gv2 to reboot.

Once it is rebooted, click again on "Network Configuration" and this time click on the "Broadband ISP Settings" tab. When this tab loads look all the way to the right on the white tab bar and click in the radio button for "IPv6". This will load the settings you need to modify. The Top box is labelled "Internet Address" and you need to select the "DHCPv6" entry. Now look at the 3rd box down labelled "DHCPv6". You should select the "Stateless Address Auto Configuration" radio button, and check the "Prefix Delegation" box. When you "apply" these settings, the firewall may reboot, so you might need to wait for it to come back up again.

Once it is rebooted, click again on "Network Configuration" and this time click on the "LAN Setup" tab. When this tab loads look all the way to the right on the white tab bar and click in the radio button for "IPv6". This will load the settings you need to modify.

The top box is "IPv6 LAN Setup". In here you should choose a subnet of your assigned prefix (my prefix was XXXX:YYYY:ZZZZ:2800/56, so I chose XXXX:YYYY:ZZZZ:28**F0**/64 as my local address prefix). You will note that I have the F0 in bold because it is crazy important for you to make note of that prefix. THAT is going to be the /64 prefix for your entire LAN.

Configuring Your Firewall For DHCPv6 Address Assignment.

NOTE!!! Although this section defines how to configure your firewall for DHCPv6, that DOES NOT mean that you cannot statically assign IPv6 addresses from within your /64 to selected (1 to all) systems on your network.

The next box down is labelled "DHCPv6". Set the "DHCP Status" to Enable DHCPv6 Server". Set the "DHCP Mode" to Stateless. Check the Prefix Delegation box. Enter your desired domain name. "Server Preference" can be "0".

Now IF you have DNS servers that serve both IPv4 and IPv6 you can put one or both in the two DNS Server address boxes and set the "DNS Servers" to "Use Below". If you do not have the servers, select "Use DNS From ISP". Finally, you can apply your settings!

After all that, we need to define the pool of IPv6 Addresses your DHCPv6 server can pull from for assigning on your network. In the box labelled "List of IPv6 Address Pools" box click on the "Add" button to open the dialog for entering the Start, End, and prefix length of the pool you wish to define.

Because your local network will likely not need all 18,446,744,073,709,551,616 (in words that is eighteen quintillion, four hundred forty-six quadrillion, seven hundred forty-four trillion, seventy-three billion, seven hundred nine million, five hundred fifty one thousand, six hundred and 16) IPv6 addresses in your delegated /64 prefix, the following is worth considering. A full and complete IPv6 address consists of 8, 16 bit segments separated by colons ":". Your delegated prefix, being a /64, uses only the high order 4 segments e.g. XXXX:YYYY:ZZZZ:NNf0. This leaves 4 segments for you to use in numbering your network, for instance:

> Your DHCPv6 pool can be XXXX:YYYY:ZZZZ:NNf0:000d:????:????:0000-ffff.

> Your Static range can be XXXX:YYYY:ZZZZ:NNf0:1f0e:????:????:????

You can see where by keeping the /64 prefix intact, you can allocate function specific ranges of IPv6 addresses for your internal network! You can replace the "1f0e" in my example with whatever 16 byte hex value suits you, 0000-FFFF.

Back up to the top of the page in the white tab bar, there is a button labelled RADVD, click on it to open the RADVD dialog window. Similar to adding the start and end addresses for your pool, you click on the "add" button to define a prefix that you want your FVS318Gv2 to advertise as a valid prefix back to your Comcast Cable Modem. If you are defining /64 prefixes you need to enter the XXXX:YYYY:ZZZZ: (and in my case 28f0):: prefix you want to advertise, define the length as 64, and give it a lifetime—I used 86400—that you are comfortable in seconds. The delegated prefix may already be in your RADVD configuration, if so you are good to go. Click the button to save the entry.

Before you are done, you need to set the "RADVD Status" to Enable, "Advertise Mode to "Unicast Only", "RA Flags" to "other, "Router Preference to "High", MTU to 1500, and lifetime to 3600. Then apply.

If your FVS318Gv2 hasn't rebooted after this last apply, then go to the gold menu bar and click on "Monitoring", in the grey menu bar click on "Diagnostics". In the 3rd block down, the middle button is "Reboot"—protocol does not matter here. Click this button to reboot the firewall and start everything fresh. After the reboot, it should come up into monitoring mode and on the router status tab. Here you can see you WAN IPv6 address and any IPv6 addresses on the LAN side. At this point, you should set your workstations to DHCPv6 address configuration and reboot them to get the correct addresses, and your IPv6 network should now work!

Configuring Statically Assigned IPv6 Addresses on Your LAN.

NOTE!!! As mentioned in the previous section, there is NOTHING to prevent you for hosting both DHCPv6 and statically assigned IPv6 addresses on your network. Since the IPv6 address assignment for different operating systems differs greatly, I will not attempt to address those procedures in this document.

My Final Configuration.

As most of the systems within my home network serve me as both clients and servers for a variety of applications, I want to document the IPv6 addresses for all my machines, so I have elected to assign static addresses to my systems. In my previous IPv6, 6tun4, setup the servers all have static addresses. Now I have to go back and re-address my IPv6 portion of the network and update my bind configurations.

So, with the above, you should have a choice of DHCP or static addressing, but you should be able to set up either from this document and with the specific equipment and firmware numbers provided at the top of this document. These same processes may work with other combinations of manufacturer, model, and firmware, but I have not tested any of those.

Issues Encountered Doing My Setup.

NONE Yet Encountered.