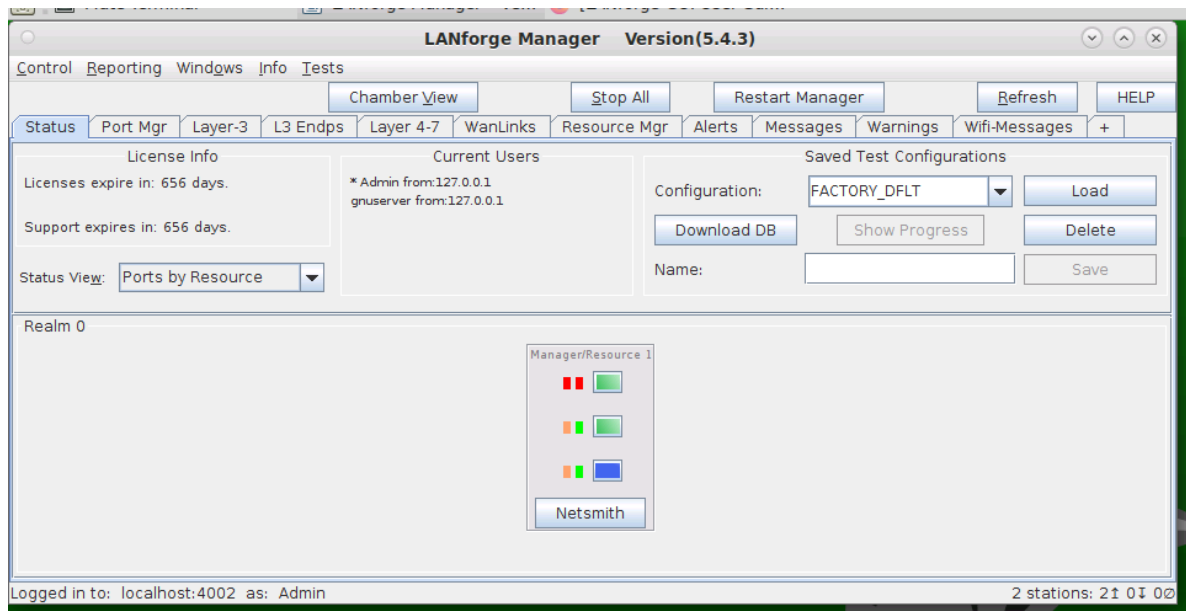


## Routed Mode WanLink with WanPaths

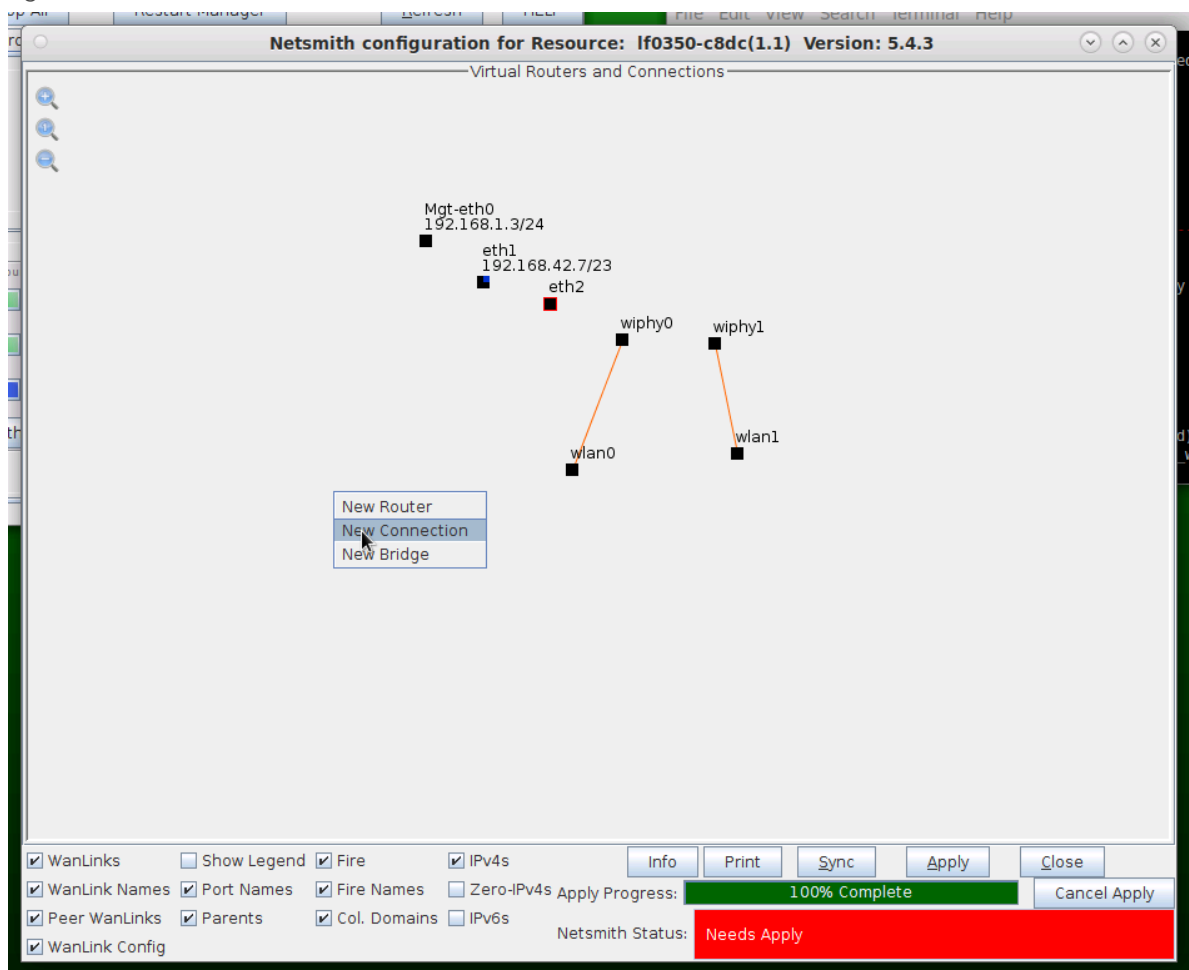
**Goal:** Setup a Routed Mode WanLink with WanPaths.

In this test scenario, LANforge-ICE is used to filter traffic by IP address on a WanLink with the use of WanPaths.

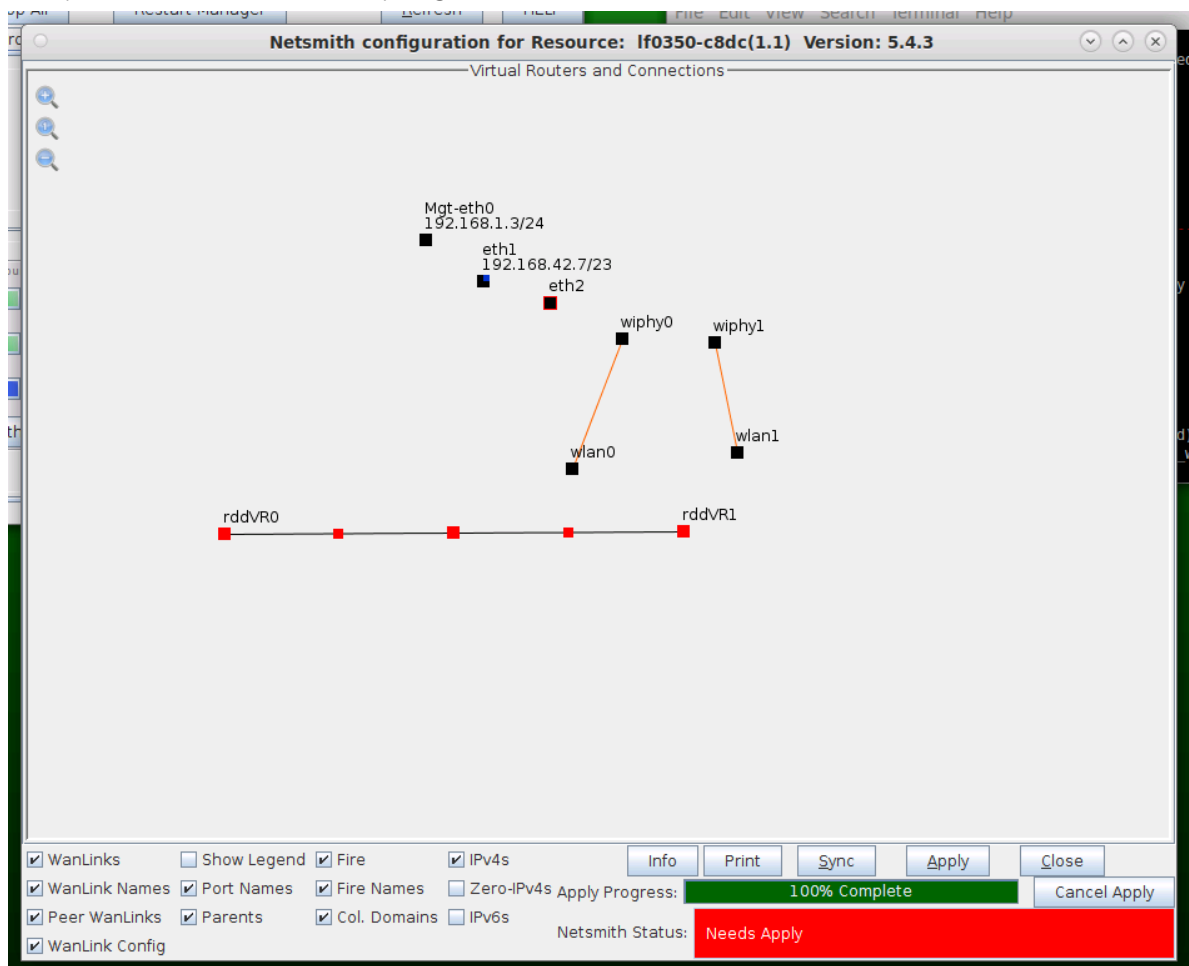
1. Setup a Netsmith connection.
  - A. Go to the **Status** tab and click **Netsmith**



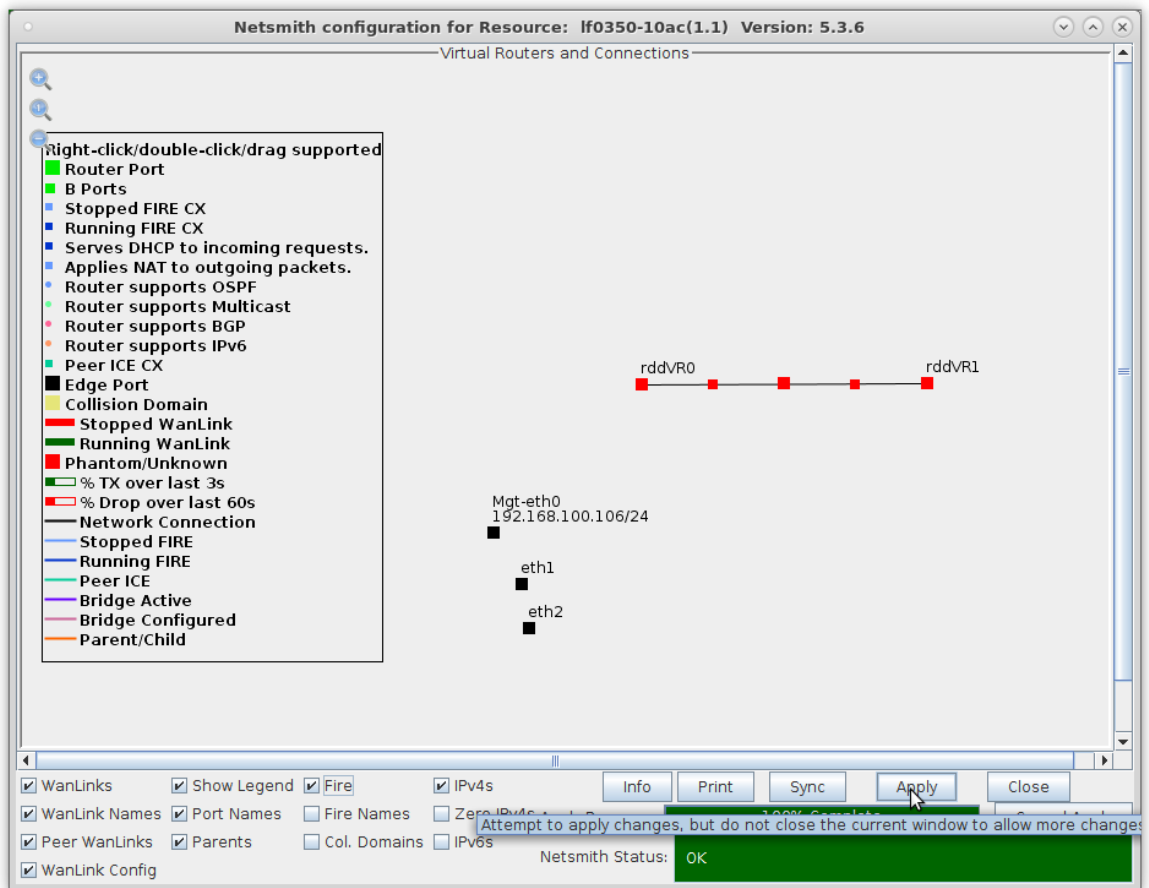
B. Right-click in the Netsmith window and select **New Connection**



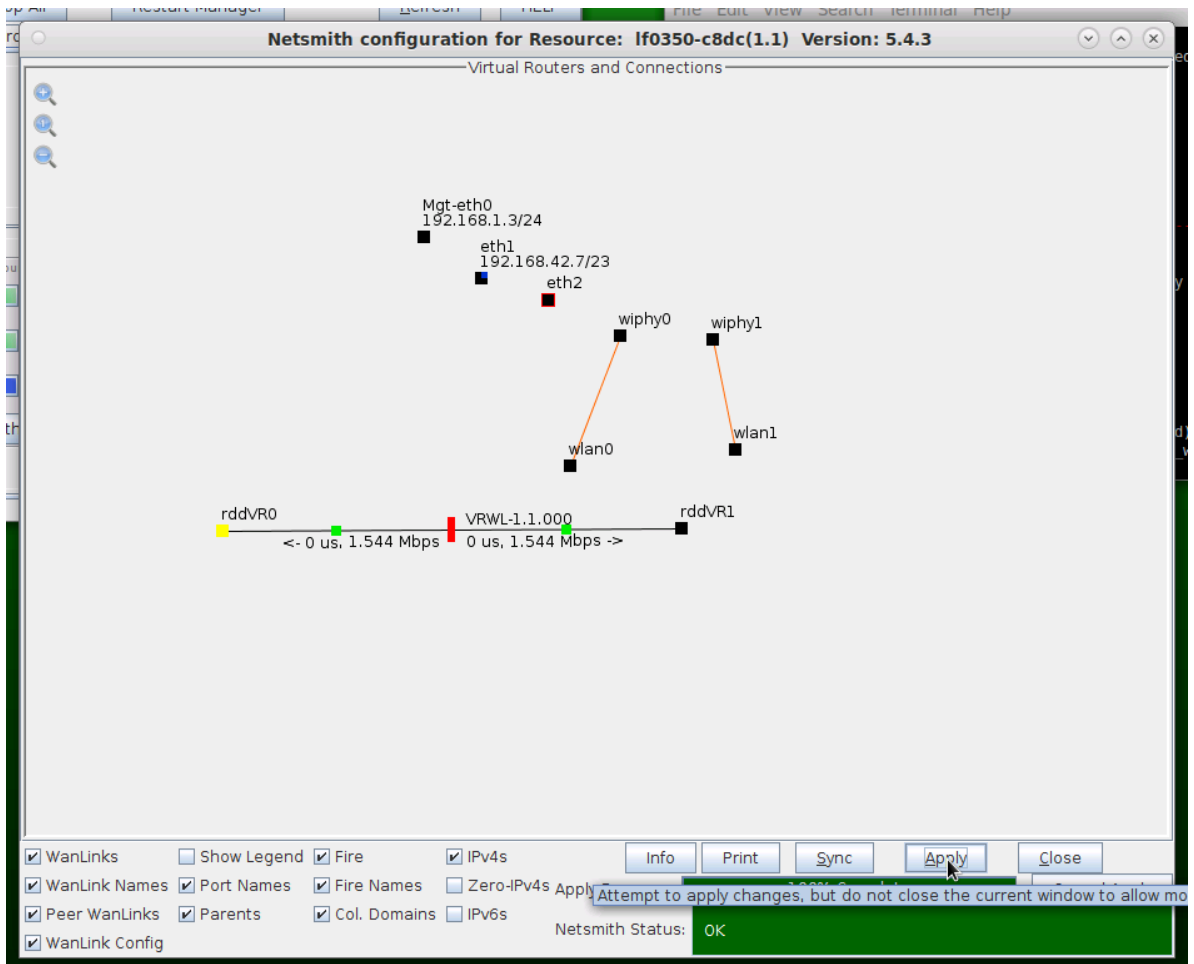
C. Accept defaults, **Auto Create** everything and click **OK**



D. Click **Apply** in the Netsmith window to create the connection



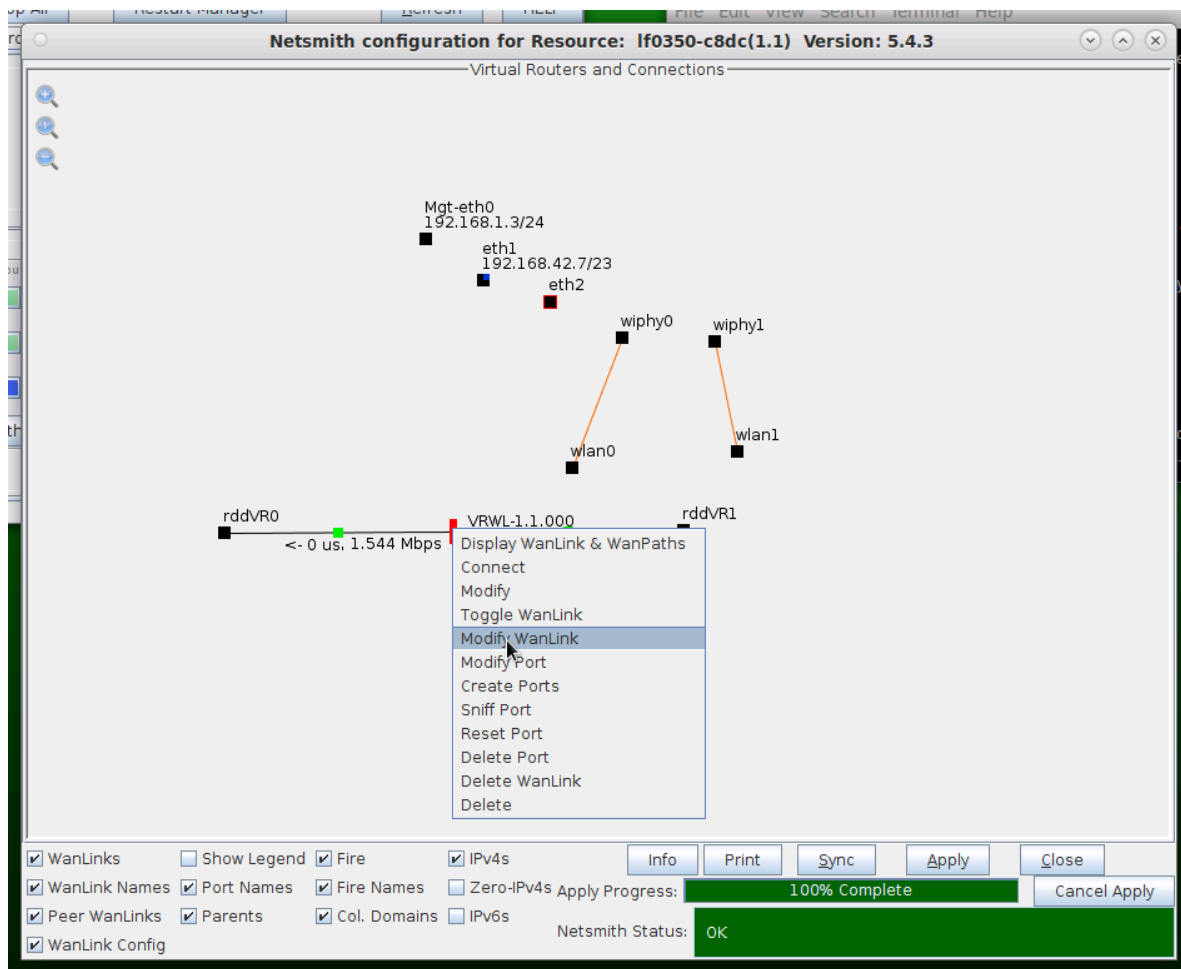
E. The Netsmith window after applying changes



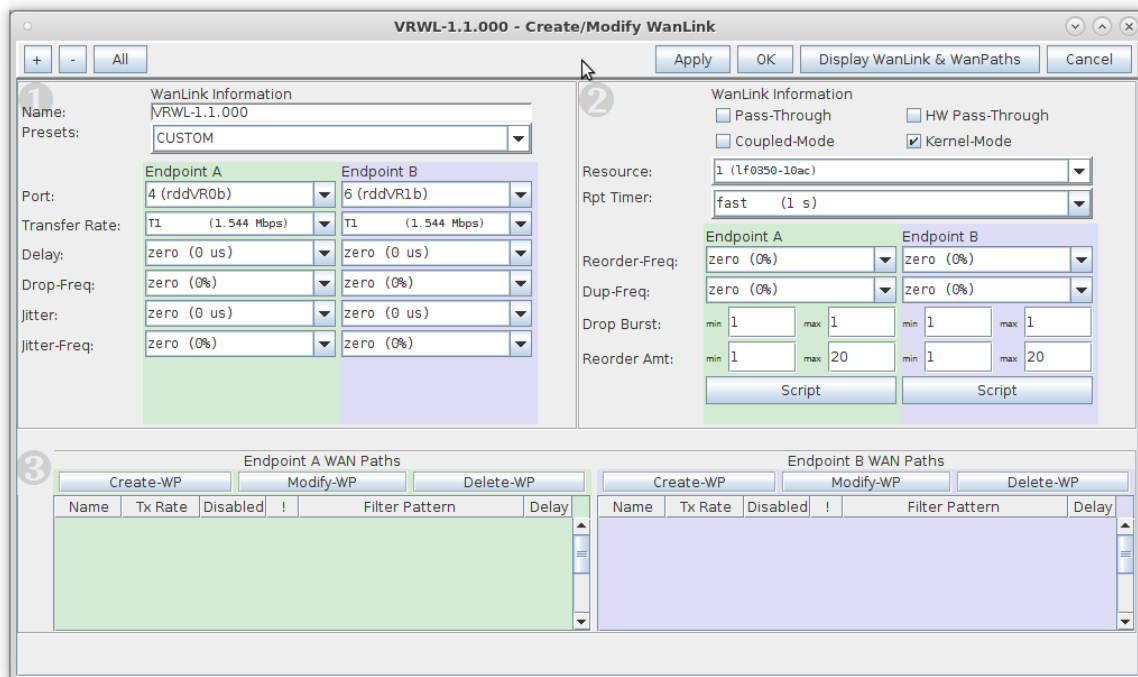
For more information see [LANforge-GUI User Guide: Netsmith](#)

## 2. Setup the WanLink.

### A. Right-click the WanLink and select **Modify WanLink**



### B. Setup the WanLink with values larger than what each of the WanPaths will use



A. WanPaths are subordinate to WanLinks. WanLinks, therefore, should be configured with sufficient bandwidth and buffering required by all of its WanPaths

B. Click **Apply** and leave the *Create/Modify WanLink* window open

For more information see [LANforge-GUI User Guide: WanLinks](#)

3. Setup the WanPaths.

- A. Click **Create-WP** on Entry Point A to create a new WanPath on this WanLink

**Create/Modify WanPath for Endpoint: VRWL-1.1.000-A**

Name: ep-1 Backlog Buffer: AUTO

PCAP Filter:

Source IP/MAC: 172.1.1.100 Source Mask: 32

Dest IP/MAC: 172.2.2.100 Dest Mask: 32

Transfer Rate: 64 Kbps (64 Kbps) Delay: zero (0 us)

Jitter: zero (0 us) Drop-Freq: zero (0%)

Min Drop Burst: 1 Max Drop Burst: 1

Min Reorder Amount: 1 Max Reorder Amount: 20

Reorder-Freq: zero (0%) Dup-Freq: zero (0%)

Jitter-Freq: zero (0%) Test Manager:

☐ ICEcap Replay Replay File: Dir

☐ Disabled ☒ Loop Replay ☒ Replay Latency ☒ Replay Loss

☒ Same As WanLink ☒ Replay Dup ☒ Replay Bandwidth ☐ Use Pcap Filter

☐ Inverse Match ☐ Drop-Xth ☐ Duplicate-Xth ☐ Reorder-Xth

**Corruption #0**

Rate: 0 Corruption: Random Write

Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #1**

Rate: 0 Corruption: Random Write

Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #2**

Rate: 0 Corruption: Random Write

Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #3**

Rate: 0 Corruption: Random Write

Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #4**

Rate: 0 Corruption: Random Write

Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #5**

Rate: 0 Corruption: Random Write

Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

- A. **NOTE:** In order to filter by specific IP address, use a Source and Dest Mask of 32 to exactly match the IP coming in on the Entry Point
- B. Click **OK** to create the WanPath

B. Click **Create-WP** on Entry Point B to create a new WanPath on this WanLink

**Create/Modify WanPath for Endpoint: VRWL-1.1.000-B**

Name:  Backlog Buffer:

PCAP Filter:

Source IP/MAC:  Source Mask:

Dest IP/MAC:  Dest Mask:

Transfer Rate:  Delay:

Jitter:  Drop-Freq:

Min Drop Burst:  Max Drop Burst:

Min Reorder Amount:  Max Reorder Amount:

Reorder-Freq:  Dup-Freq:

Jitter-Freq:  Test Manager:

☐ ICEcap Replay Replay File:

☐ Disabled ☒ Loop Replay ☒ Replay Latency ☒ Replay Loss

☒ Same As WanLink ☒ Replay Dup ☒ Replay Bandwidth ☐ Use Pcap Filter

☐ Inverse Match ☐ Drop-Xth ☐ Duplicate-Xth ☐ Reorder-Xth

**Corruption #0**

Rate:  Corruption:  Byte-to-Write:

Min Offset:  Max Offset:

☐ Chain-to-Next ☐ Do Checksum

**Corruption #1**

Rate:  Corruption:  Byte-to-Write:

Min Offset:  Max Offset:

☐ Chain-to-Next ☐ Do Checksum

**Corruption #2**

Rate:  Corruption:  Byte-to-Write:

Min Offset:  Max Offset:

☐ Chain-to-Next ☐ Do Checksum

**Corruption #3**

Rate:  Corruption:  Byte-to-Write:

Min Offset:  Max Offset:

☐ Chain-to-Next ☐ Do Checksum

**Corruption #4**

Rate:  Corruption:  Byte-to-Write:

Min Offset:  Max Offset:

☐ Chain-to-Next ☐ Do Checksum

**Corruption #5**

Rate:  Corruption:  Byte-to-Write:

Min Offset:  Max Offset:

☐ Chain-to-Next ☐ Do Checksum

A. **NOTE:** The Source and Destination IPs for this WanPath are the reverse of those for Entry Point A

B. Click **OK** to create the WanPath



C. Create a second WanPath for this WanLink using the next set of IP addresses

**Create/Modify WanPath for Endpoint: VRWL-1.1.000-A**

Name: ep-3 Backlog Buffer: AUTO

PCAP Filter:

Source IP/MAC: 172.1.1.101 Source Mask: 255.255.255.0

Dest IP/MAC: 172.2.2.101 Dest Mask: 255.255.255.0

Transfer Rate: 64 Kbps Delay: zero (0 us)

Jitter: zero (0 us) Drop-Freq: zero (0%)

Min Drop Burst: 1 Max Drop Burst: 1

Min Reorder Amount: 1 Max Reorder Amount: 20

Reorder-Freq: zero (0%) Dup-Freq: zero (0%)

Jitter-Freq: zero (0%) Test Manager:

☐ ICEcap Replay Replay File: Dir

☐ Disabled ☒ Loop Replay ☒ Replay Latency ☒ Replay Loss

☒ Same As WanLink ☒ Replay Dup ☒ Replay Bandwidth ☐ Use Pcap Filter

☐ Inverse Match ☐ Drop-Xth ☐ Duplicate-Xth ☐ Reorder-Xth

**Corruption #0**

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #1**

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #2**

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #3**

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #4**

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #5**

Rate: 0

Corruption: Random Write

Byte-to-Write: 0

Min Offset: 0

Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

D. Reverse the Source and Destination IPs for this corresponding WanPath

**Create/Modify WanPath for Endpoint: VRWL-1.1.000-B**

Name: ep-4 Backlog Buffer: AUTO

PCAP Filter:

Source IP/MAC: 172.2.2.101 Source Mask: 255.255.255.255

Dest IP/MAC: 172.1.1.101 Dest Mask: 255.255.255.255

Transfer Rate: 64 Kbps Delay: zero (0 us)

Jitter: zero (0 us) Drop-Freq: zero (0%)

Min Drop Burst: 1 Max Drop Burst: 1

Min Reorder Amount: 1 Max Reorder Amount: 20

Reorder-Freq: zero (0%) Dup-Freq: zero (0%)

Jitter-Freq: zero (0%) Test Manager:

☐ ICEcap Replay Replay File: Dir

☐ Disabled ☒ Loop Replay ☒ Replay Latency ☒ Replay Loss

☒ Same As WanLink ☒ Replay Dup ☒ Replay Bandwidth ☐ Use Pcap Filter

☐ Inverse Match ☐ Drop-Xth ☐ Duplicate-Xth ☐ Reorder-Xth

**Corruption #0**

Rate: 0 Corruption: Random Write Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #1**

Rate: 0 Corruption: Random Write Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #2**

Rate: 0 Corruption: Random Write Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #3**

Rate: 0 Corruption: Random Write Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #4**

Rate: 0 Corruption: Random Write Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

**Corruption #5**

Rate: 0 Corruption: Random Write Byte-to-Write: 0 Min Offset: 0 Max Offset: 0

☐ Chain-to-Next ☐ Do Checksum

E. Verify that the WanPaths on this WanLink are setup correctly, then click **OK** on the *Create/Modify WanLink* window shown here

**VRWL-1.1.000 - Create/Modify WanLink**

+ - All Apply OK Display WanLink & WanPaths Cancel

1 WanLink Information

Name: VRWL-1.1.000 Presets: CUSTOM

Port: 4 (rddVR0b) Endpoint B: 6 (rddVR1b)

Transfer Rate: T1 (1.544 Mbps) T1 (1.544 Mbps)

Delay: zero (0 us) zero (0 us)

Drop-Freq: zero (0%) zero (0%)

Jitter: zero (0 us) zero (0 us)

Jitter-Freq: zero (0%) zero (0%)

2 WanLink Information

☐ Pass-Through ☐ HW Pass-Through

☐ Coupled-Mode ☒ Kernel-Mode

Resource: 1 (1f0350-10ac)

Rpt Timer: fast (1 s)

Reorder-Freq: zero (0%) zero (0%)

Dup-Freq: zero (0%) zero (0%)

Drop Burst: min 1 max 1 min 1 max 1

Reorder Amt: min 1 max 20 min 1 max 20

Script Script

3 Endpoint A WAN Paths

Create-WP Modify-WP Delete-WP

Name	Tx Rate	Disabled	!	Filter Pattern	Delay
ep-1	64 K	<input type="checkbox"/>	<input type="checkbox"/>	Src: 172.1.1.100/32 Dest: 1...	0
ep-3	64 K	<input type="checkbox"/>	<input type="checkbox"/>	Src: 172.1.1.101/24 Dest: 1...	0

Endpoint B WAN Paths

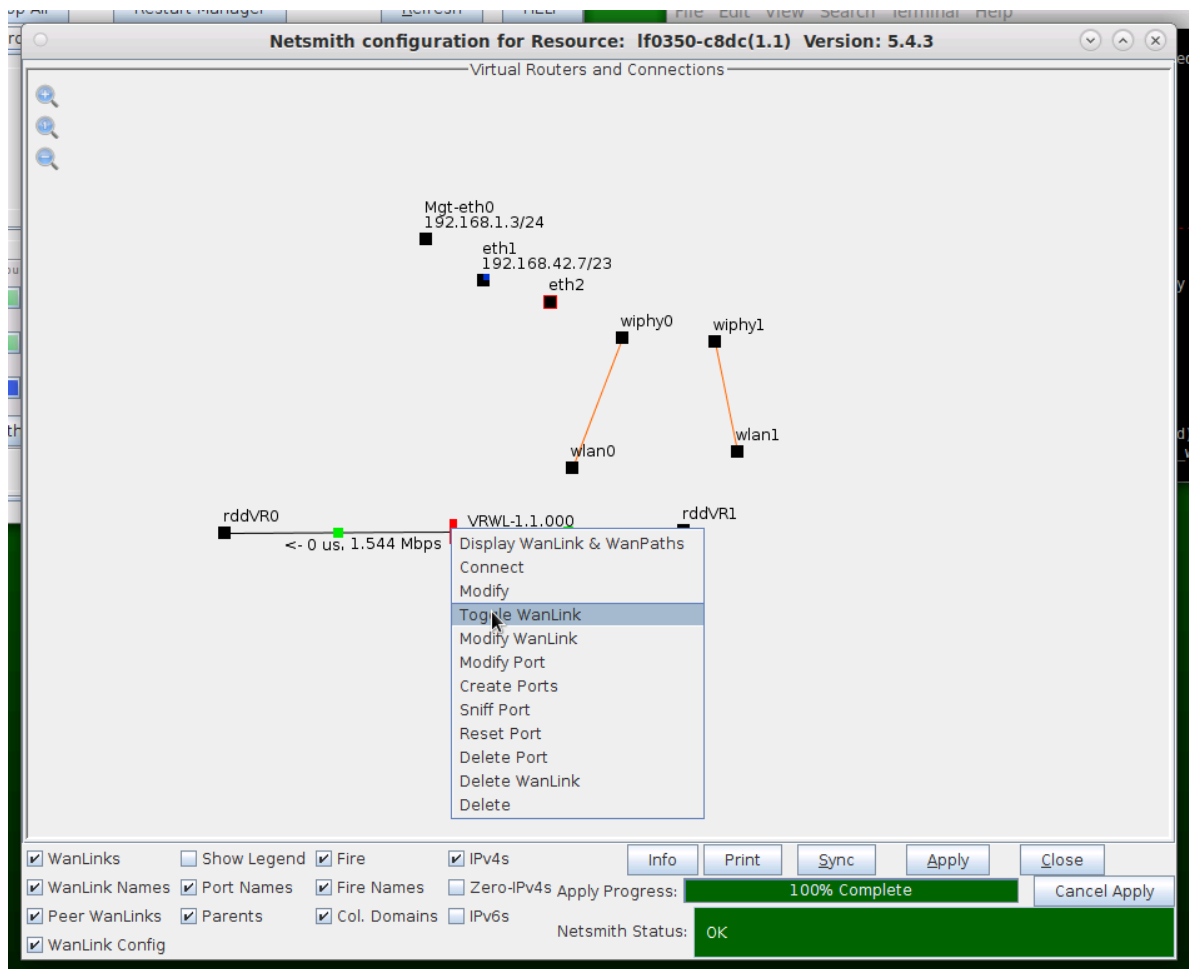
Create-WP Modify-WP Delete-WP

Name	Tx Rate	Disabled	!	Filter Pattern	Delay
ep-2	64 K	<input type="checkbox"/>	<input type="checkbox"/>	Src: 172.2.2.100/32 Dest: 1...	0
ep-4	64 K	<input type="checkbox"/>	<input type="checkbox"/>	Src: 172.2.2.101/32 Dest: 1...	0

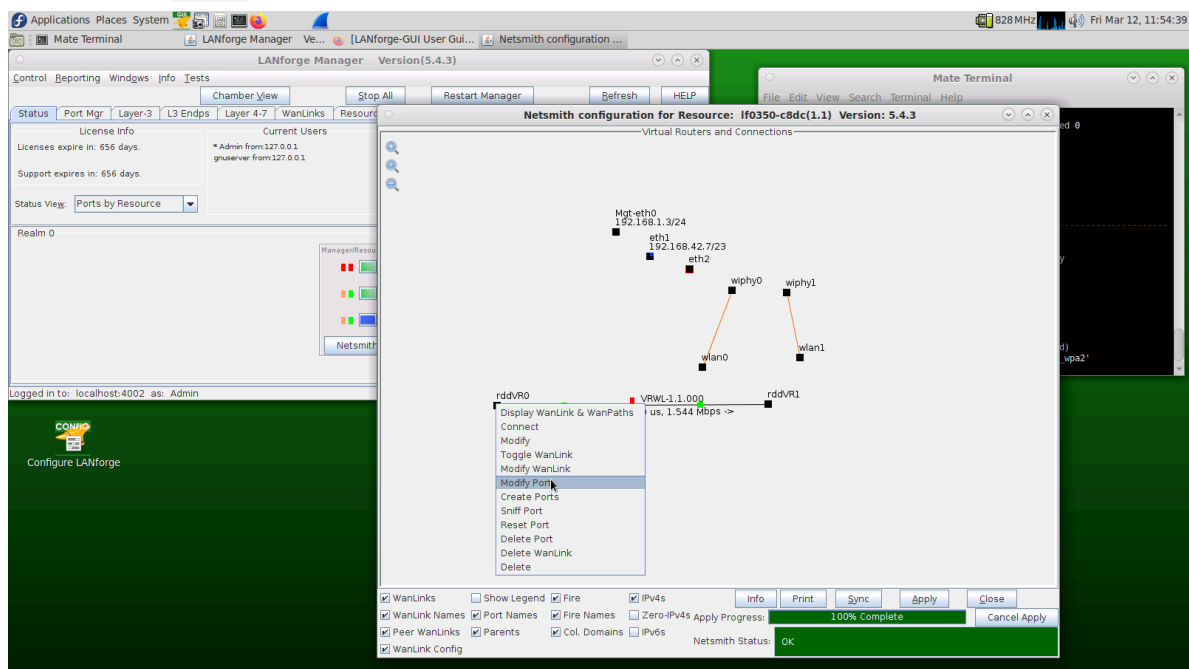
For more information see [LANforge-GUI User Guide: WanLinks](#)

4. Setup the ports with IP addresses.

A. Right-click on the WanLink and select **Toggle Wanlink**



B. Right-click port **rddVR0** and select **Modify Port**



C. Setup an IP address that is on a different network than the WanPath entry points

**rddVR0 (If0350-10ac) Configure Settings**

Port Status Information  
Current: LINK-UP PROBE-ERROR TSO UFO GSO GRO  
Driver Info: Port Type: Redirect-Device Peer: rddVR0b

Port Configurables

General Interface Settings

Enable

- ☐ Set IF Down
- ☐ Set MAC
- ☐ Set TX Q Len
- ☐ Set MTU
- ☐ Set Offload
- ☐ Set PROMISC
- ☐ Set Rx-All/FCS
- ☐ Set Bridge Info

Services

- ☐ HTTP
- ☐ FTP
- ☐ RADIUS

General Interface Settings

☐ Down ☐ Aux-Mgt

☐ DHCP-IPv6 ☒ DHCP Release DHCP Vendor ID: None

☒ DHCP-IPv4 **Secondary-IPs** DHCP Client ID: None

DNS Servers: BLANK Peer IP: NA

IP Address: 10.1.1.10/24 Global IPv6: AUTO

IP Mask: 0.0.0.0 Link IPv6: AUTO

Gateway IP: 0.0.0.0 IPv6 GW: AUTO

Alias: MTU: 1500

MAC Addr: da:bf:f9:94:a6:4f TX Q Len: 1000

Br Cost: ignore Priority: ignore

Rpt Timer: medium (8 s) WiFi Bridge: NONE

Port Rates

- ☐ 10bt-HD
- ☐ 10bt-FD
- ☐ 100bt-HD
- ☐ 100bt-FD
- ☐ 1000-FD
- ☒ 10G-FD
- ☐ 40G-FD
- ☐ Autonegotiate

Advert Rates

- ☐ 10bt-HD
- ☐ 10bt-FD
- ☐ 100bt-HD
- ☐ 100bt-FD
- ☐ 1000-FD
- ☐ 10G-FD
- ☐ 40G-FD
- ☐ Flow-Control

Offload

- ☒ TSO Enabled
- ☒ UFO Enabled
- ☒ GSO Enabled
- ☐ LRO Enabled
- ☒ GRO Enabled

Renegotiate

Restart Xcvr

PROMISC

RX-ALL

RX-FCS

Bypass NOW!

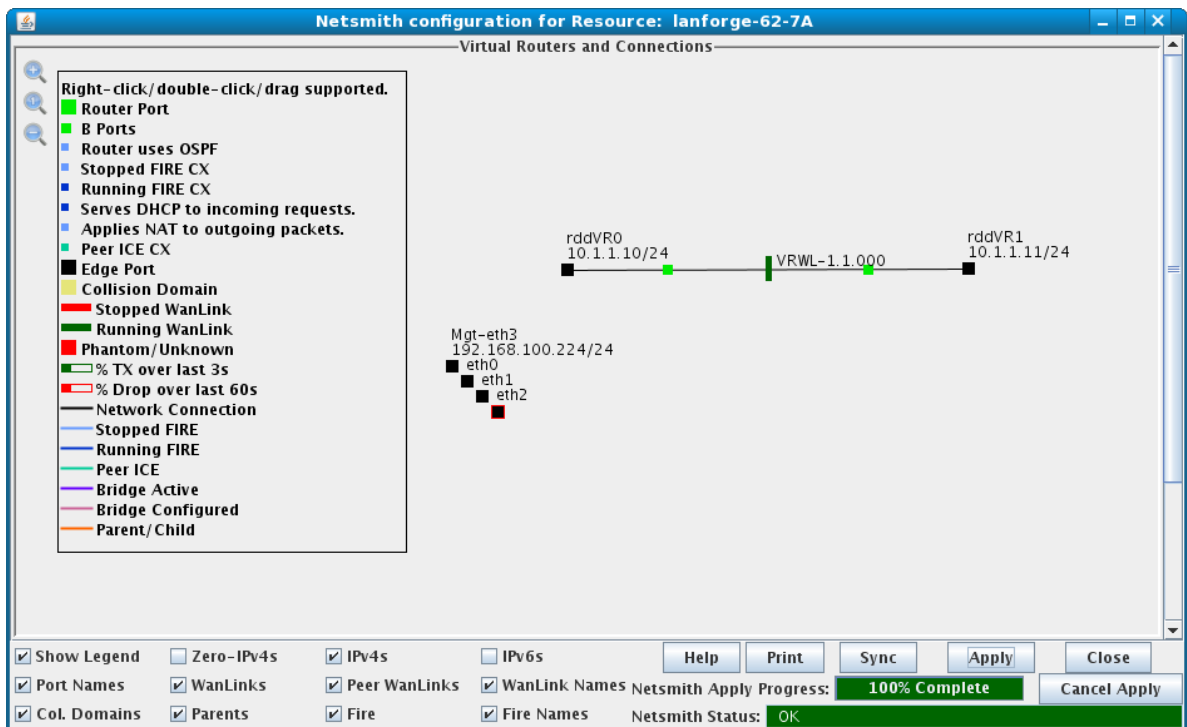
Bypass Power-UP

Bypass Power-DOWN

Bypass Disconnect

Print View Details Probe Sync Apply OK Cancel

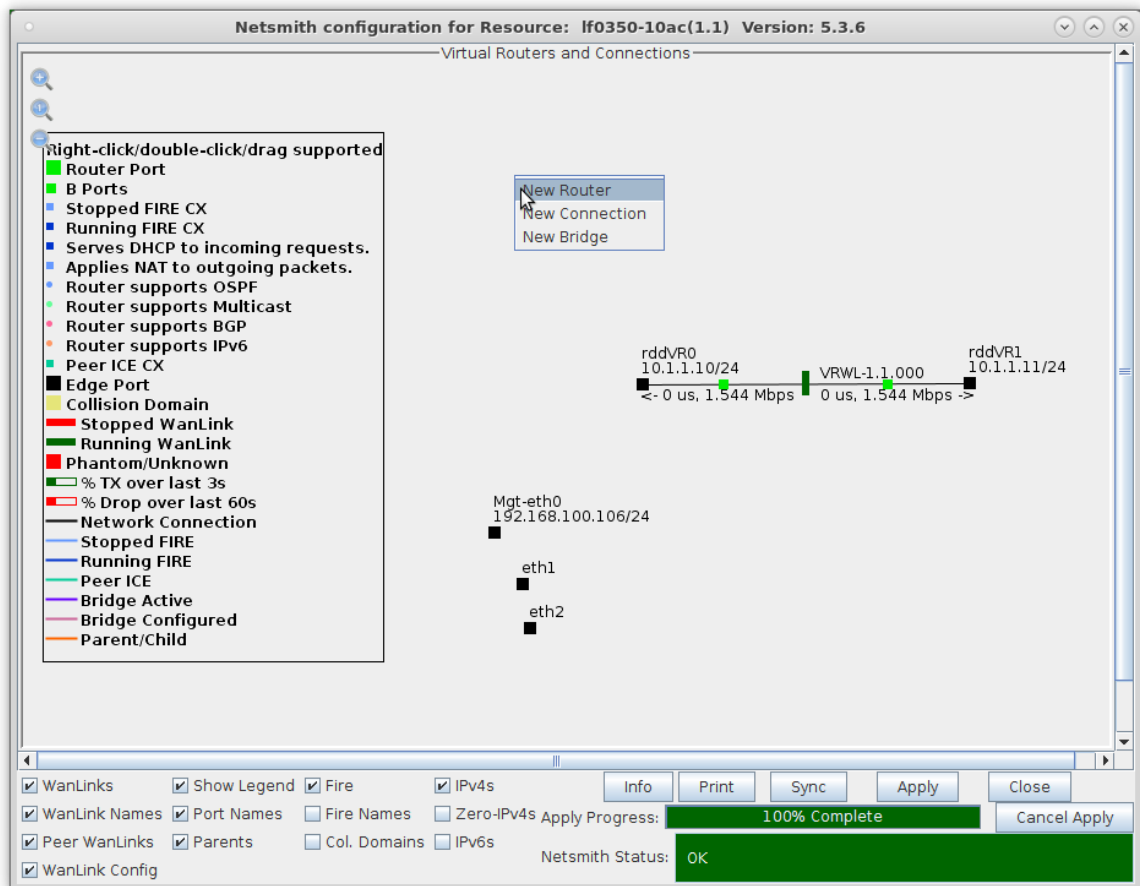
D. Setup an IP address on port rddVR1 that is on the same network as rddVR0



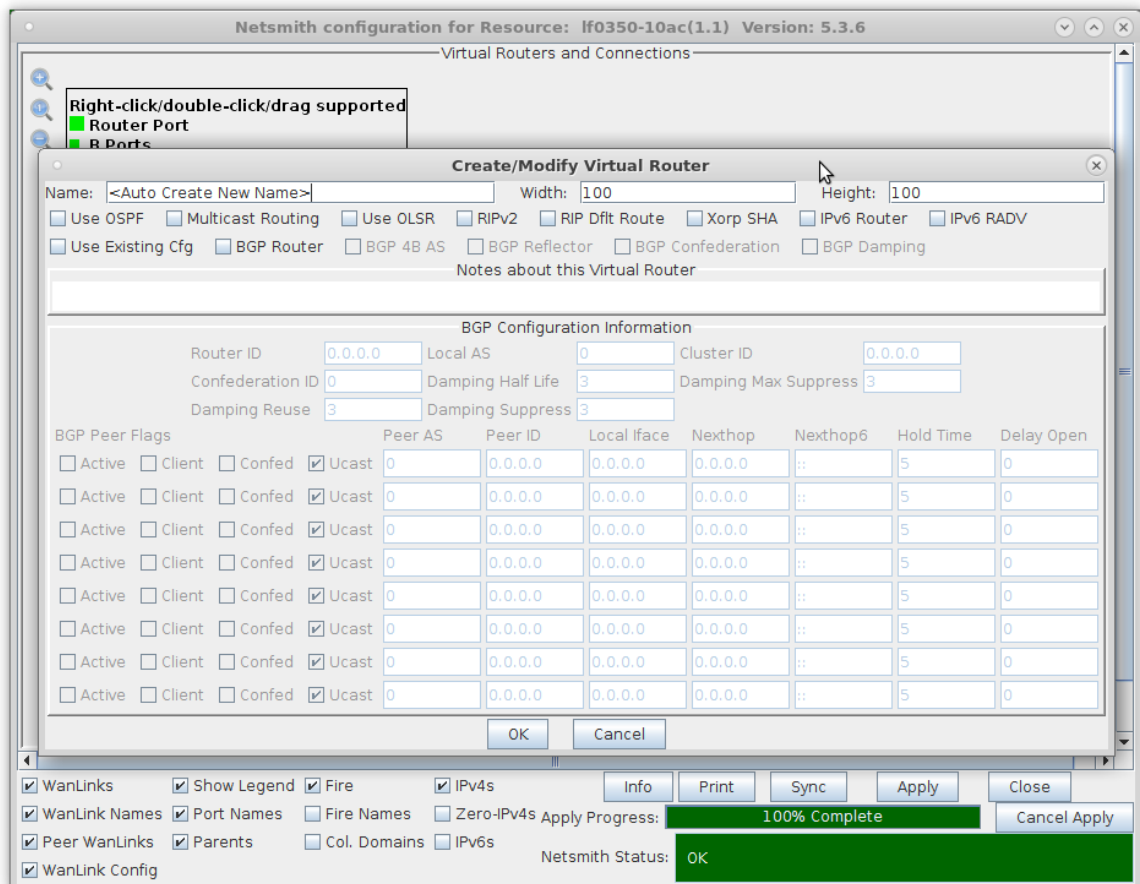
For more information see [LANforge-GUI User Guide: WanLinks](#)

5. Add the Virtual Routers.

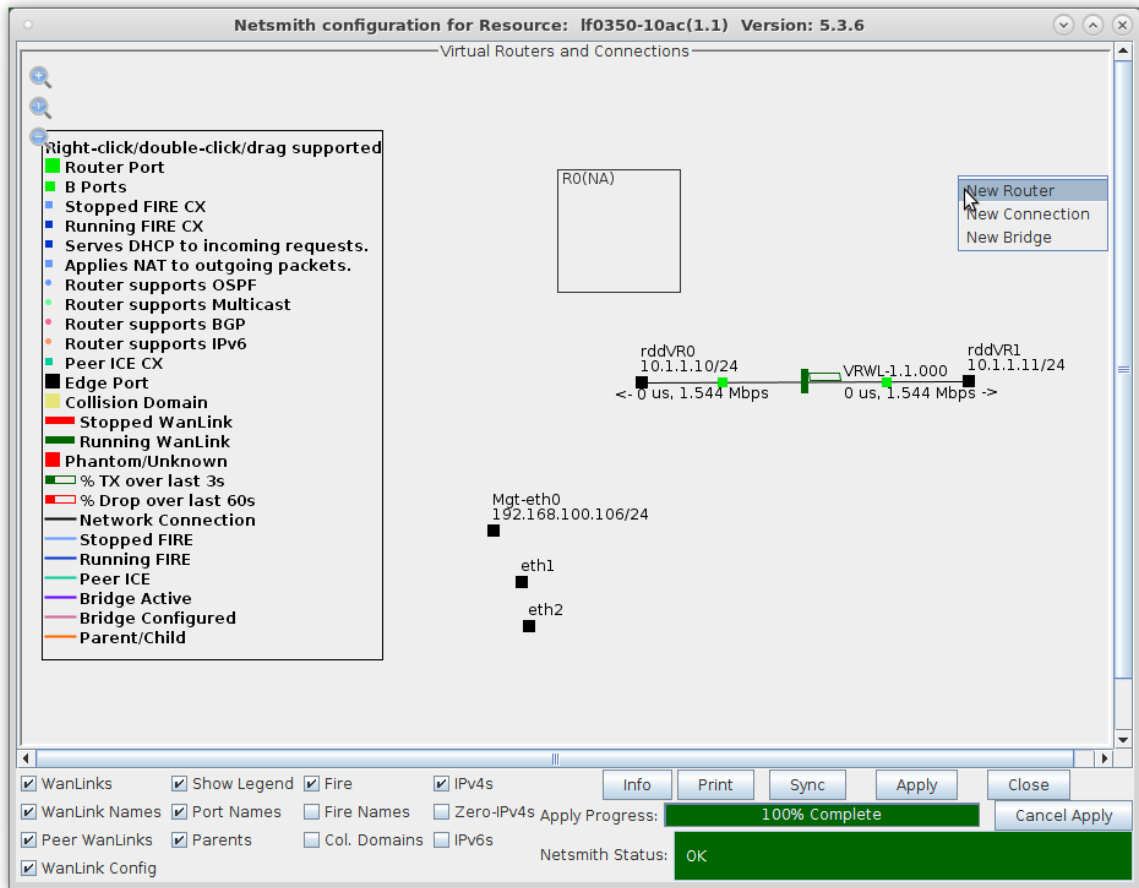
A. Right-click in the Netsmith window and select **New Router**



B. Accept the defaults or change the Virtual Router name and graphical size

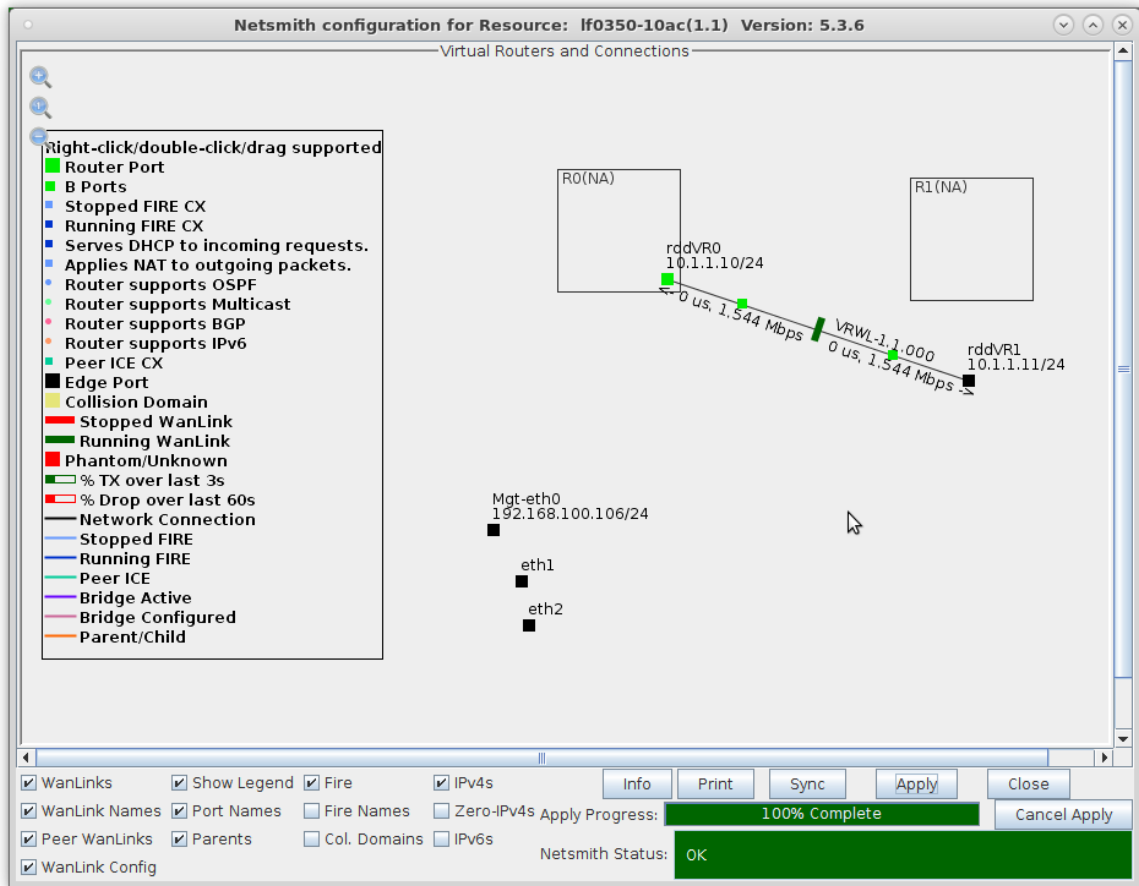


C. Click the **Apply** button and repeat for the second Virtual Router

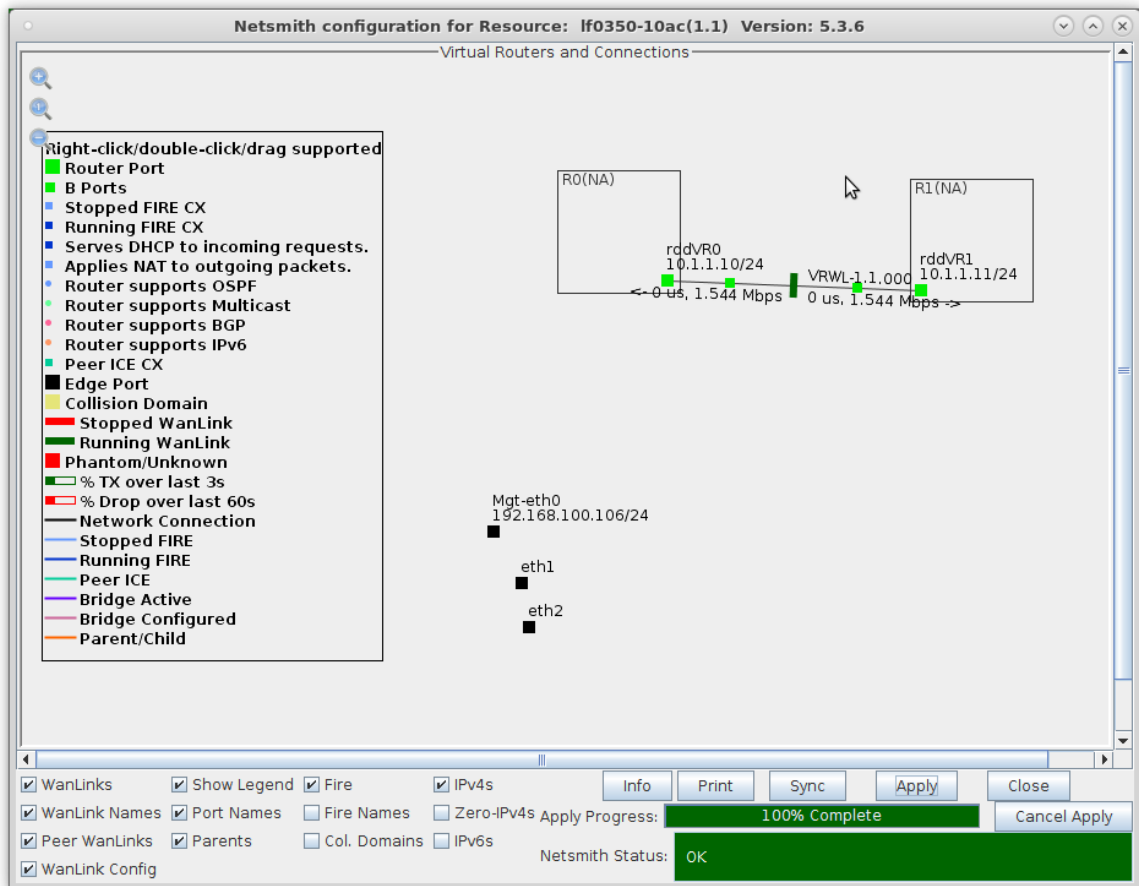


- A. **NOTE:** After making any changes to the Netsmith window, you must click **Apply** or your changes will NOT be implemented and could be lost
- B. **NOTE:** Clicking **Sync** makes sure any changes are synchronized with the current database

D. Left-click `rddVR0` and drag it inside `Router R0(1)`

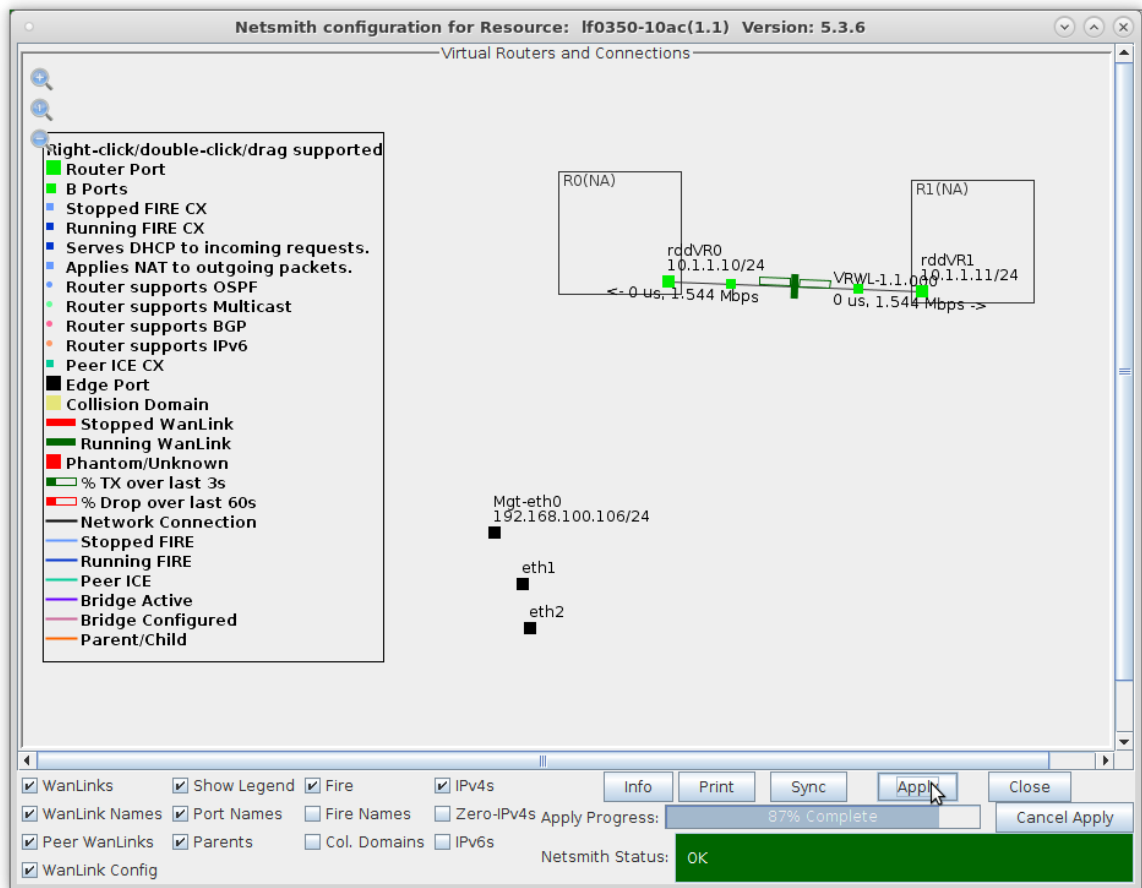


E. Left-click `rddVR1` and drag it inside `Router R1(2)`





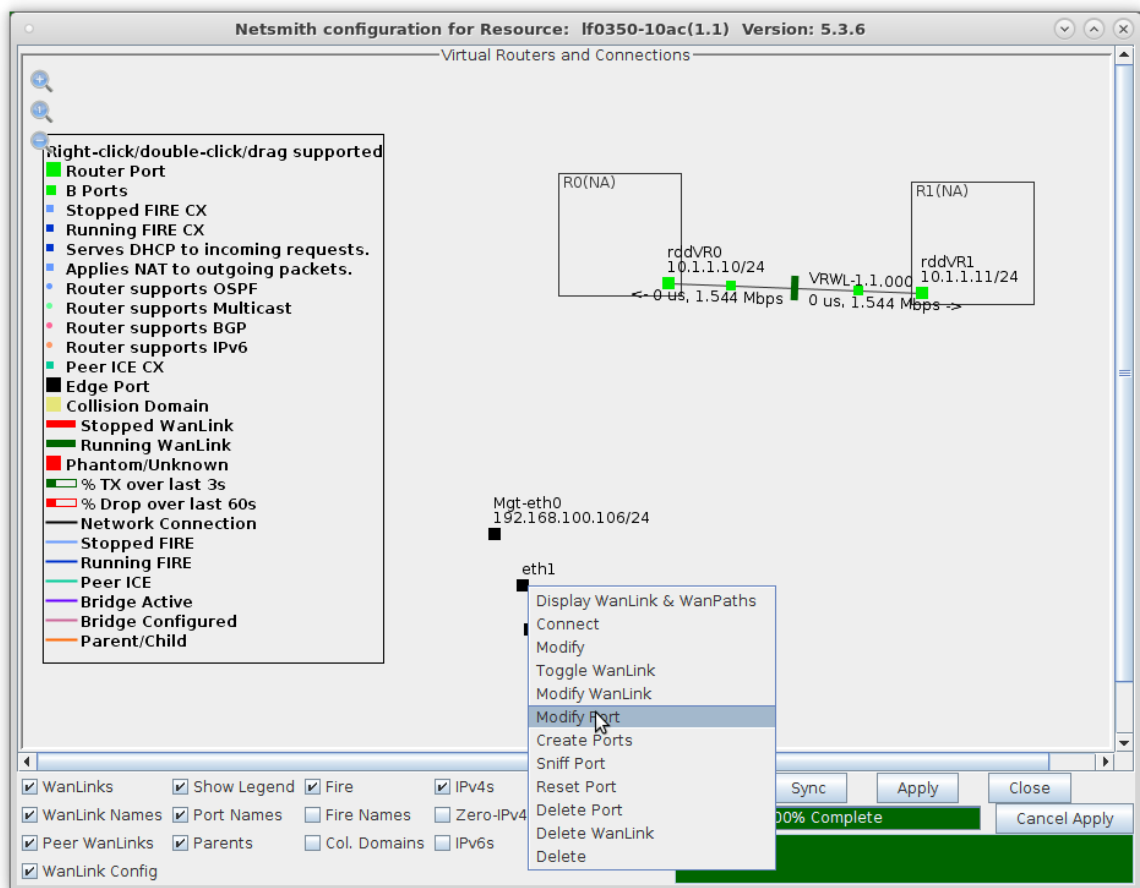
F. Apply your changes in Netsmith



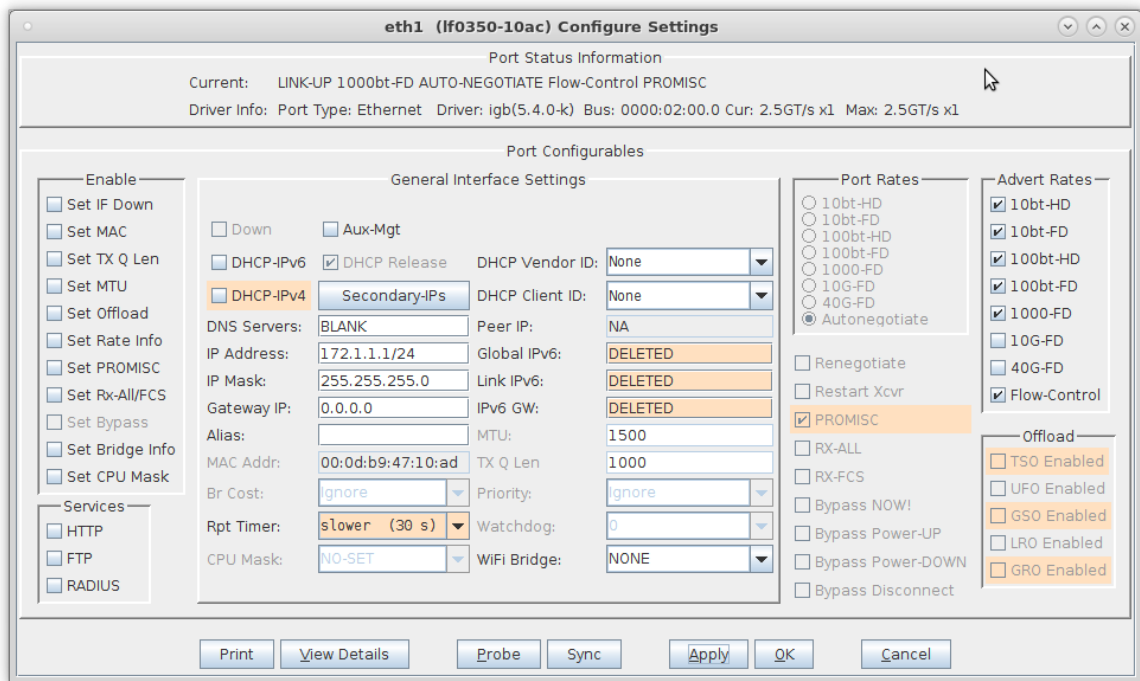
For more information see [LANforge-GUI User Guide: WanLinks](#)

6. Setup the external interfaces.

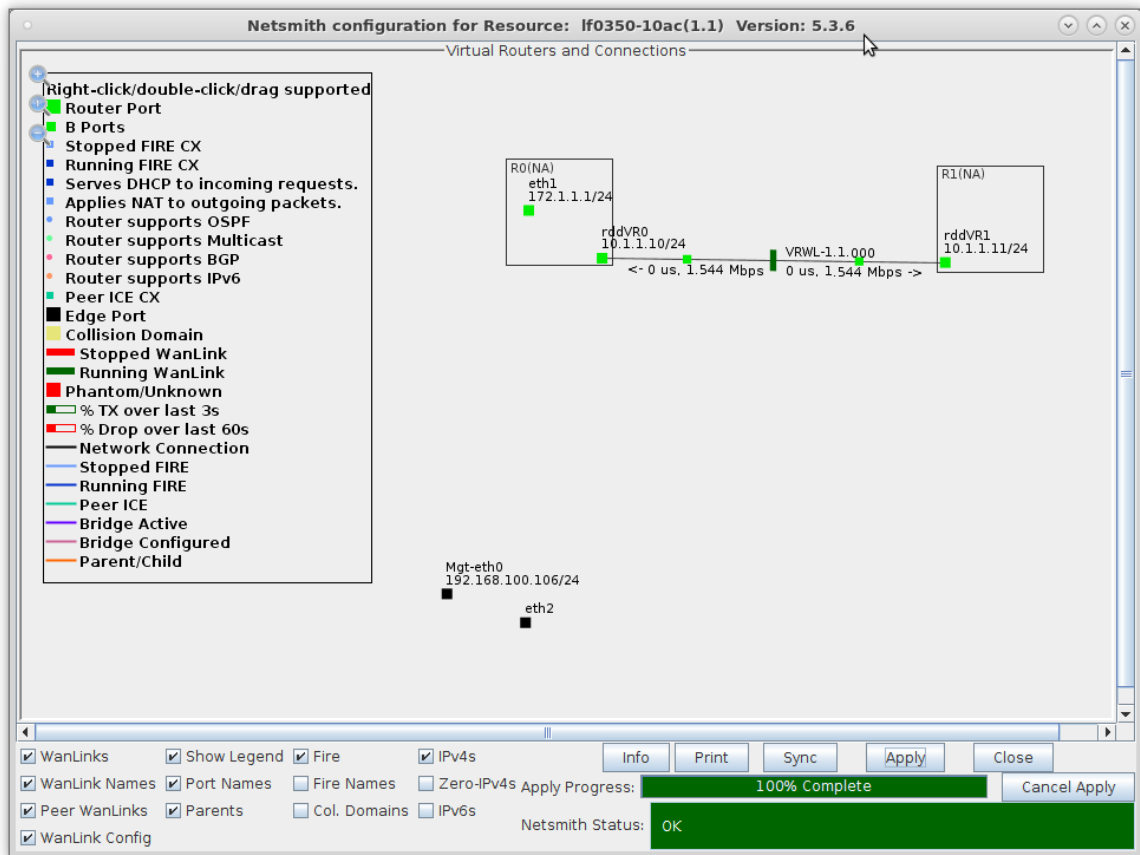
A. Right-click port **eth1** and select **Modify Port**



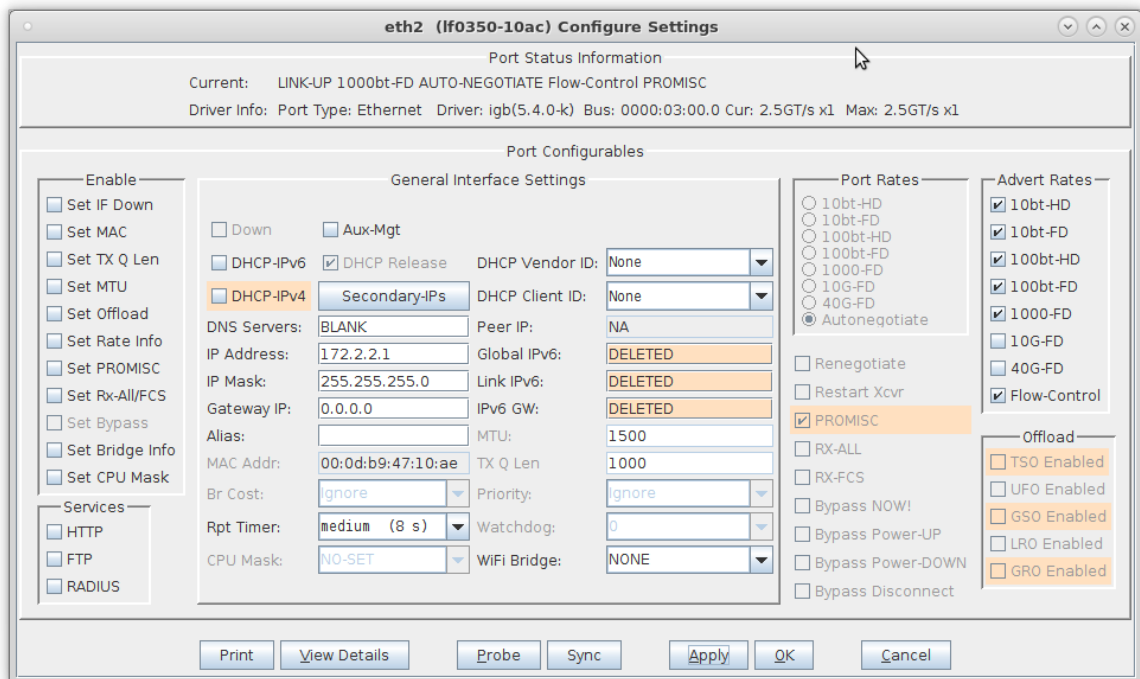
B. Setup **eth1** with a valid IP address and IP mask that is on the same network as the WanPath entry points **ep-1** and **ep-3**



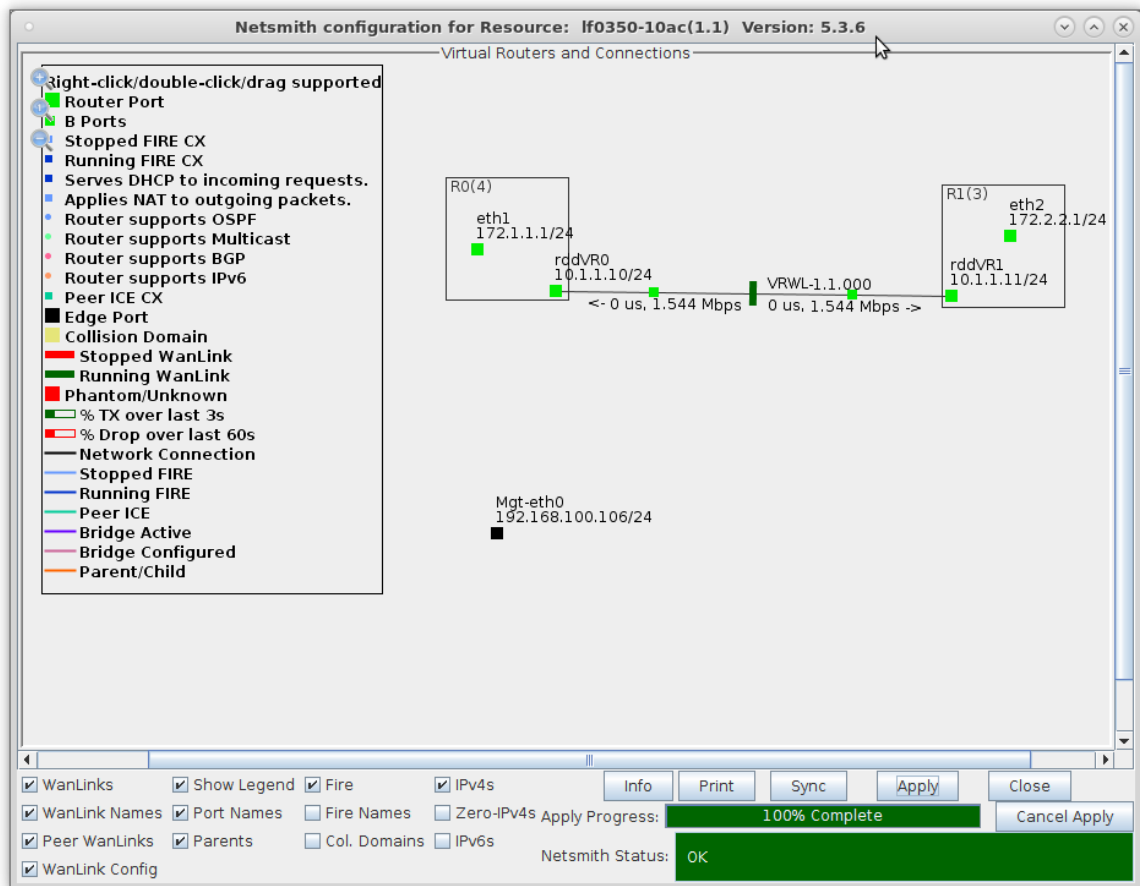
C. Left-click port **eth1** and drag it inside **Router R0(1)**



D. Setup **eth2** with a valid IP address and IP mask that is on the same network as the WanPath entry points **ep-2** and **ep-4**



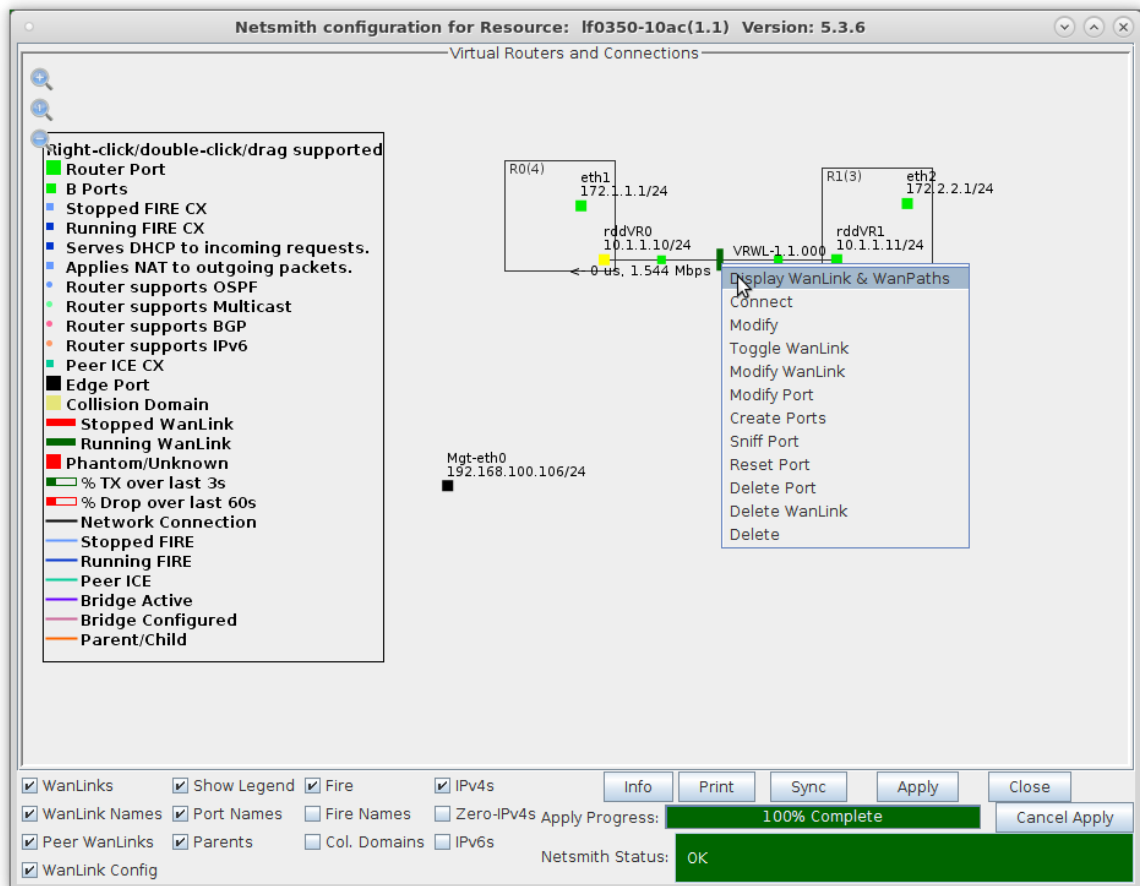
E. Drag `eth2` inside `Router R1(2)` and Apply changes in NetSmith



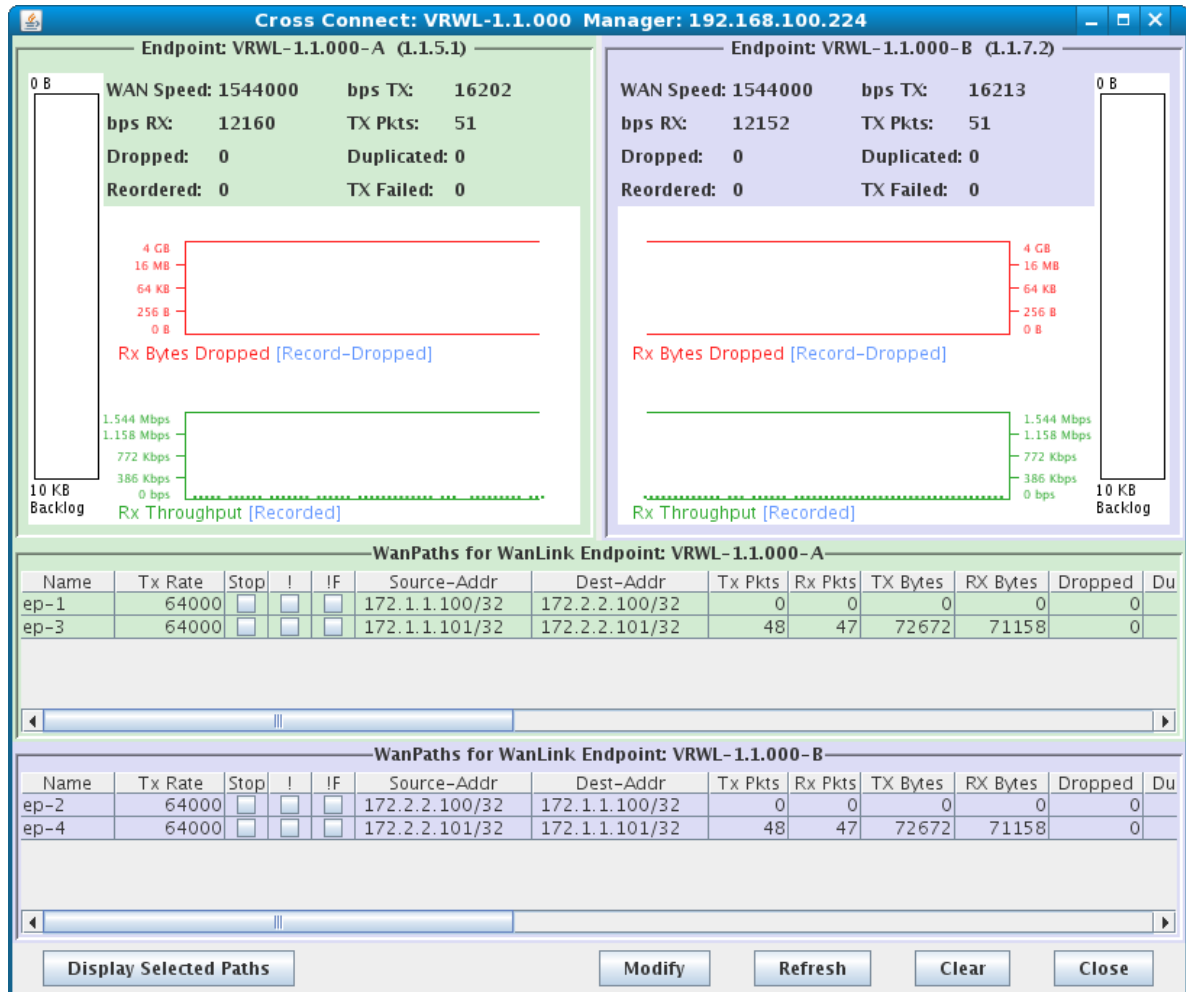
For more information see [LANforge-GUI User Guide: WanLinks](#)

- Run traffic to LANforge-ICE ports `eth1` and `eth2`, then display results. Refer to the [LANforge FIRE Cookbook](#) to run traffic.

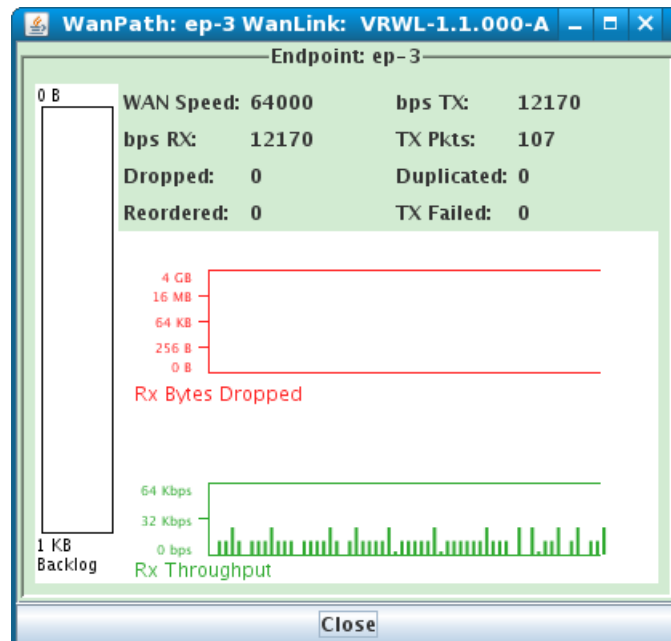
A. Right-click the WanLink and select **Display Wanlink & WanPaths**



- B. The lower half of the WanLink display shows traffic passing on WanPath entry points **ep-3** and **ep-4** and other IP address are excluded from passing on the WanLink



- C. Select a WanPath and click **Display Selected Paths** in the lower left corner of the WanLink display window



For more information see [LANforge-GUI User Guide: WanLinks](#)