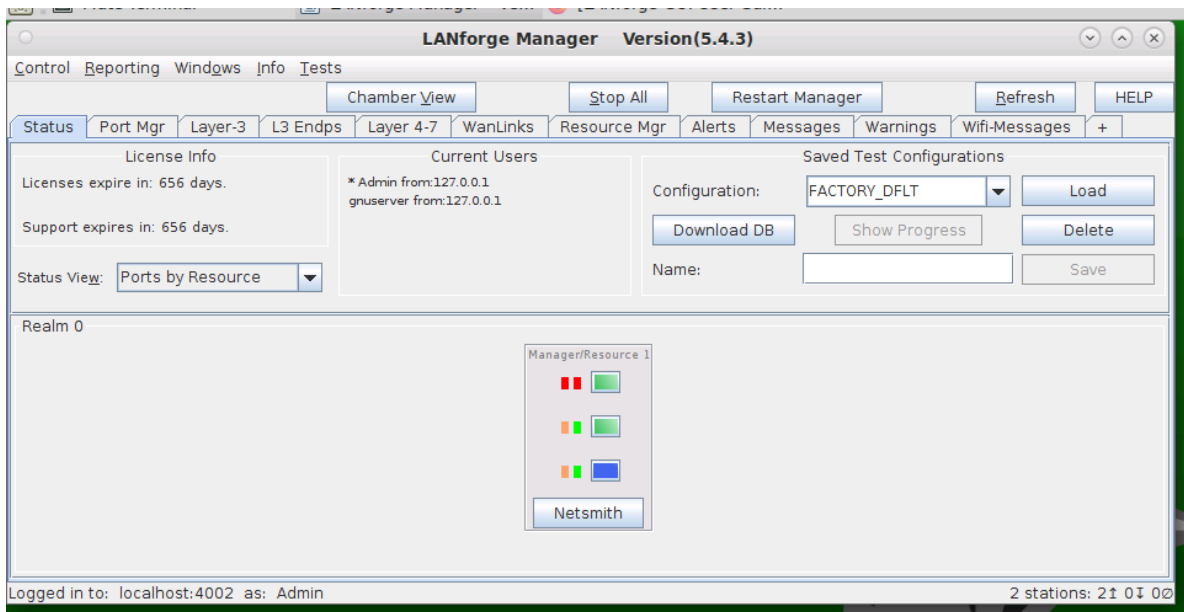


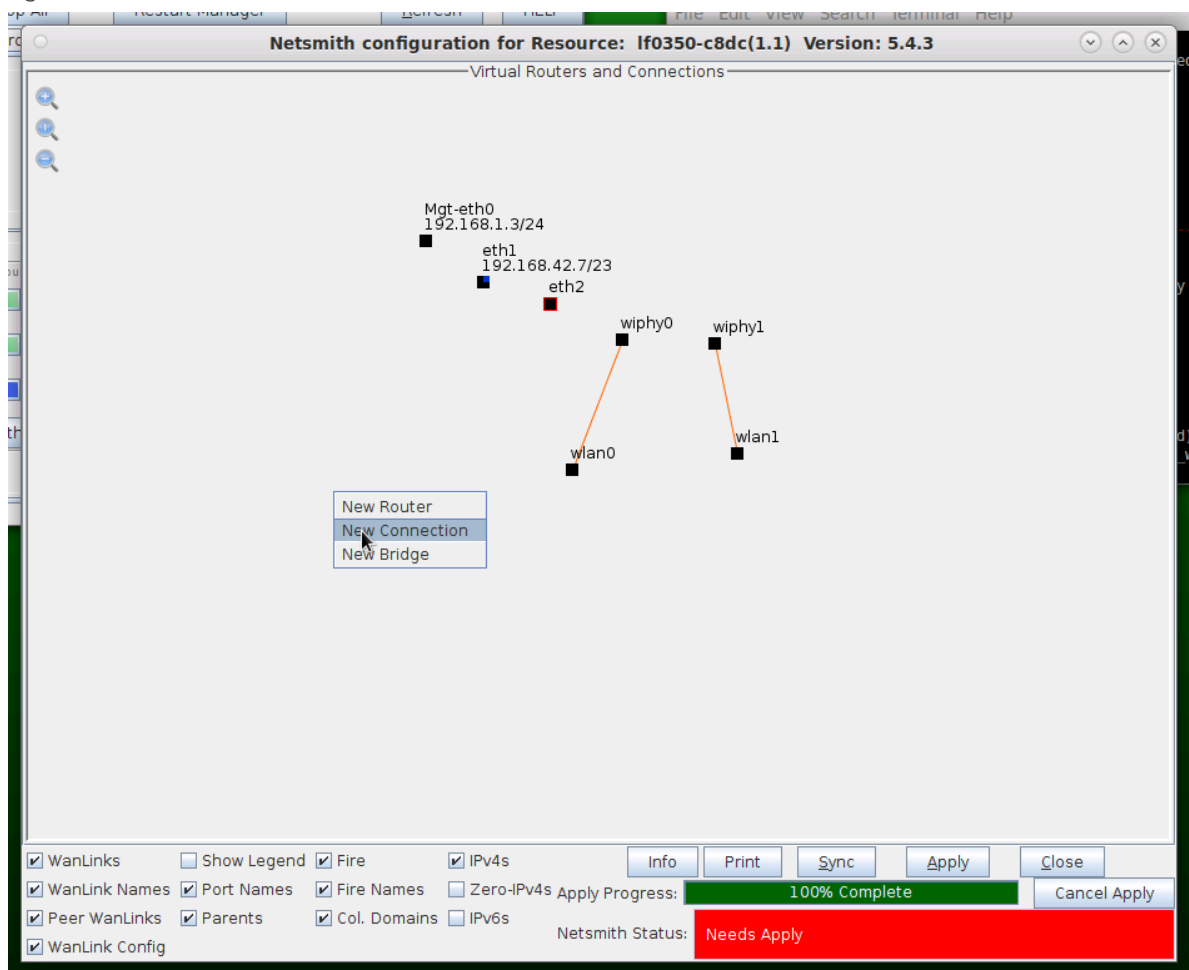
Routed Mode WanLinks with a Single Physical Port

Goal: Setup a Routed Mode WanLink between two Virtual Routers that only use one physical port. In this test scenario, LANforge-ICE is used to simulate a routed network where a single physical port is used for incoming and outgoing traffic. The traffic will enter the physical port and will then be sent through two Virtual Routers connected by a WanLink and then back out the same physical port.

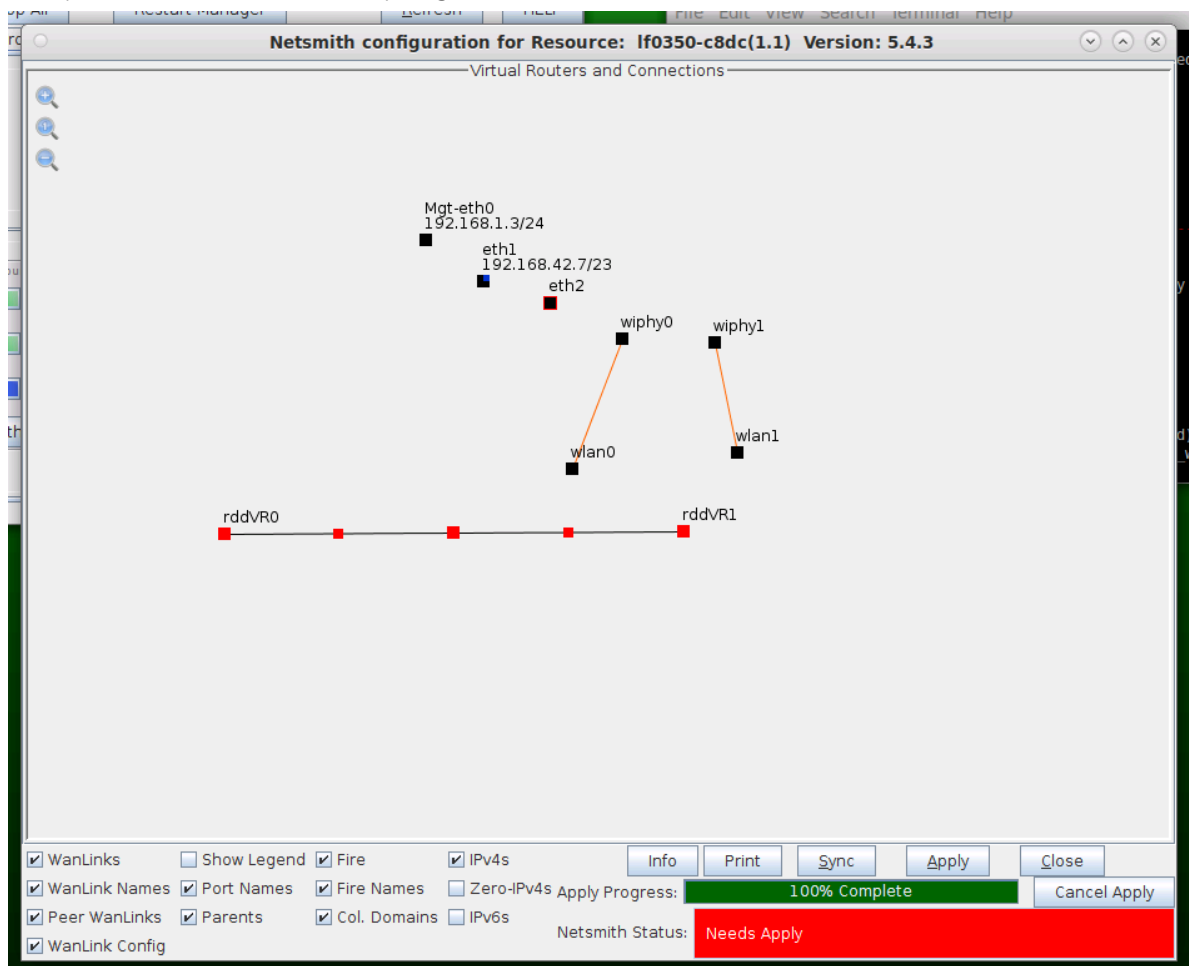
1. Setup a Netsmith Connection.
 - A. Go to the **Status** tab and click **Netsmith**



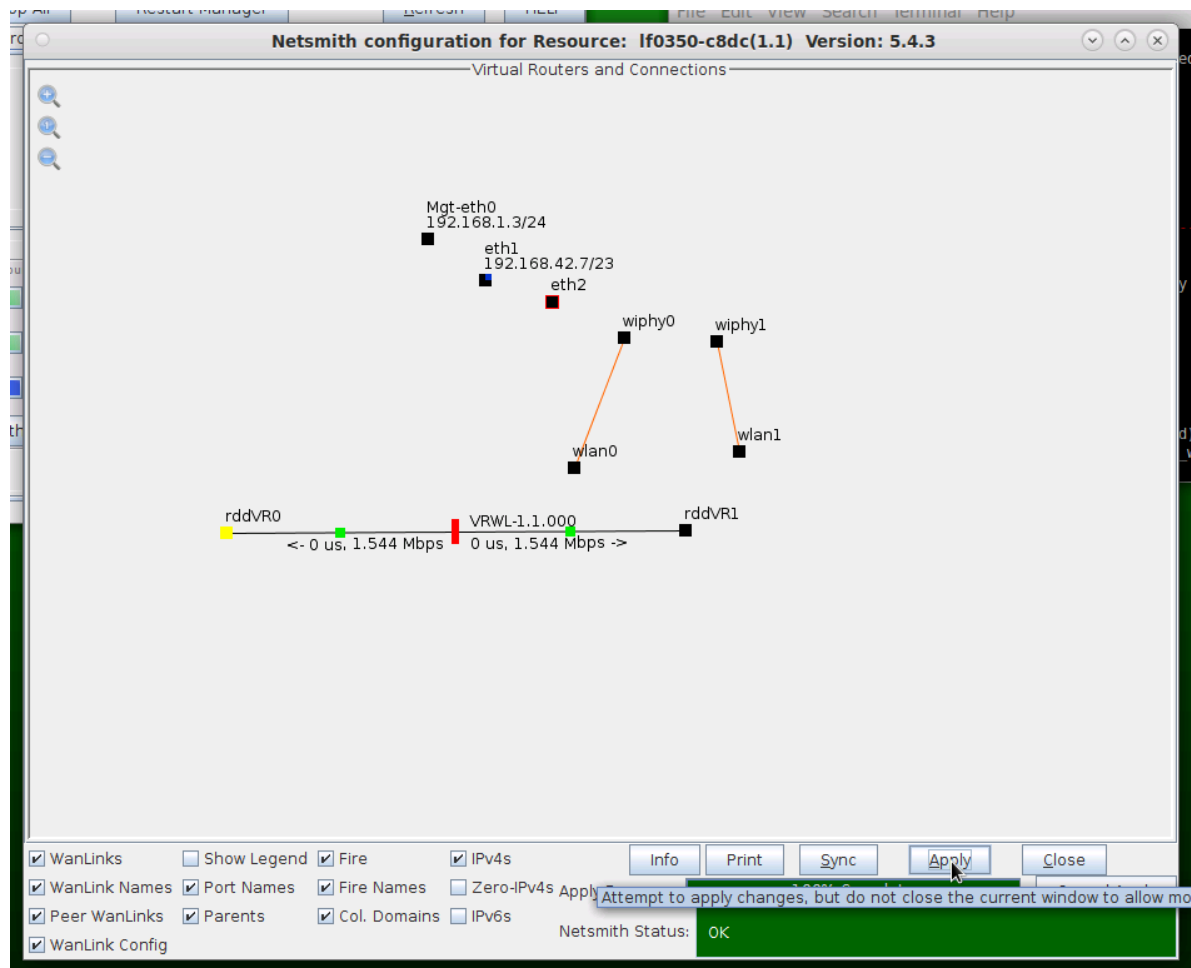
B. Right-click in the Netsmith window and select **New Connection**



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



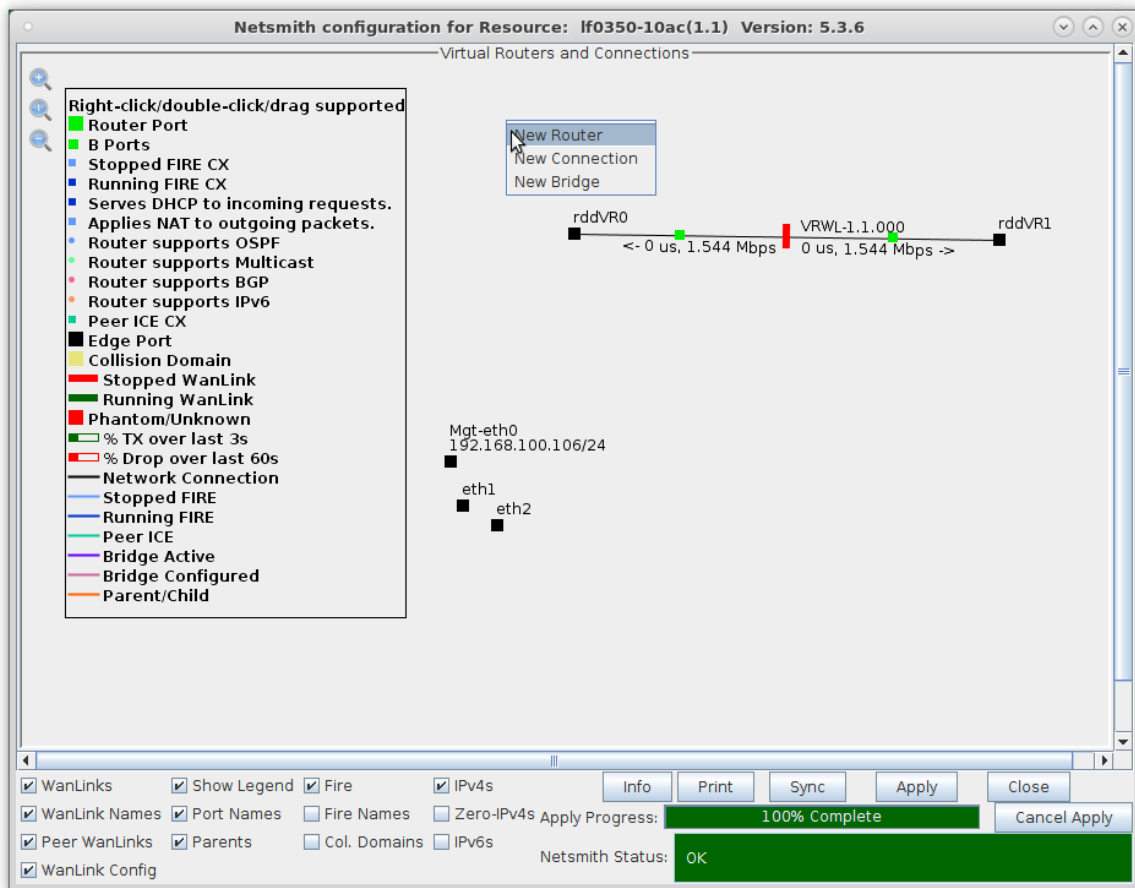
D. Click **Apply** in the Netsmith window to create the connection



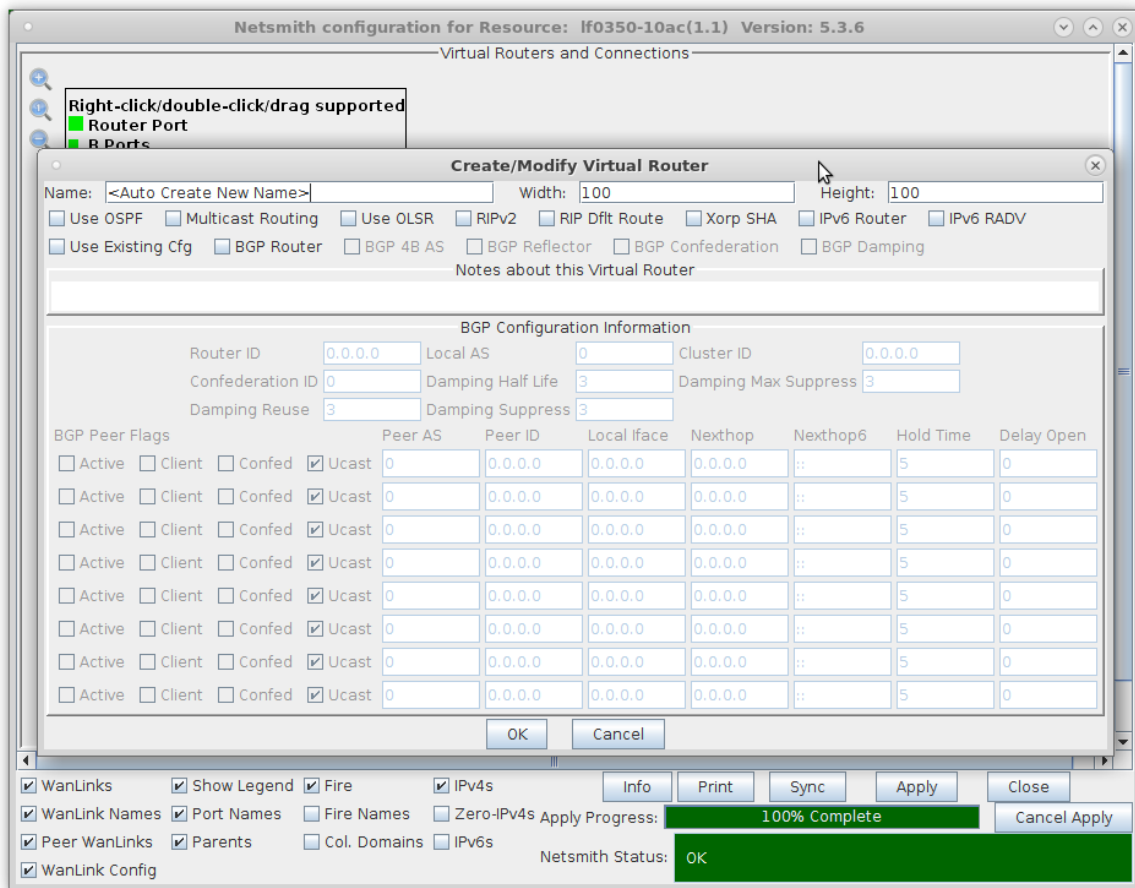
For more information see [LANforge-GUI User Guide: Netsmith](#)

2. Setup two Virtual Routers.

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

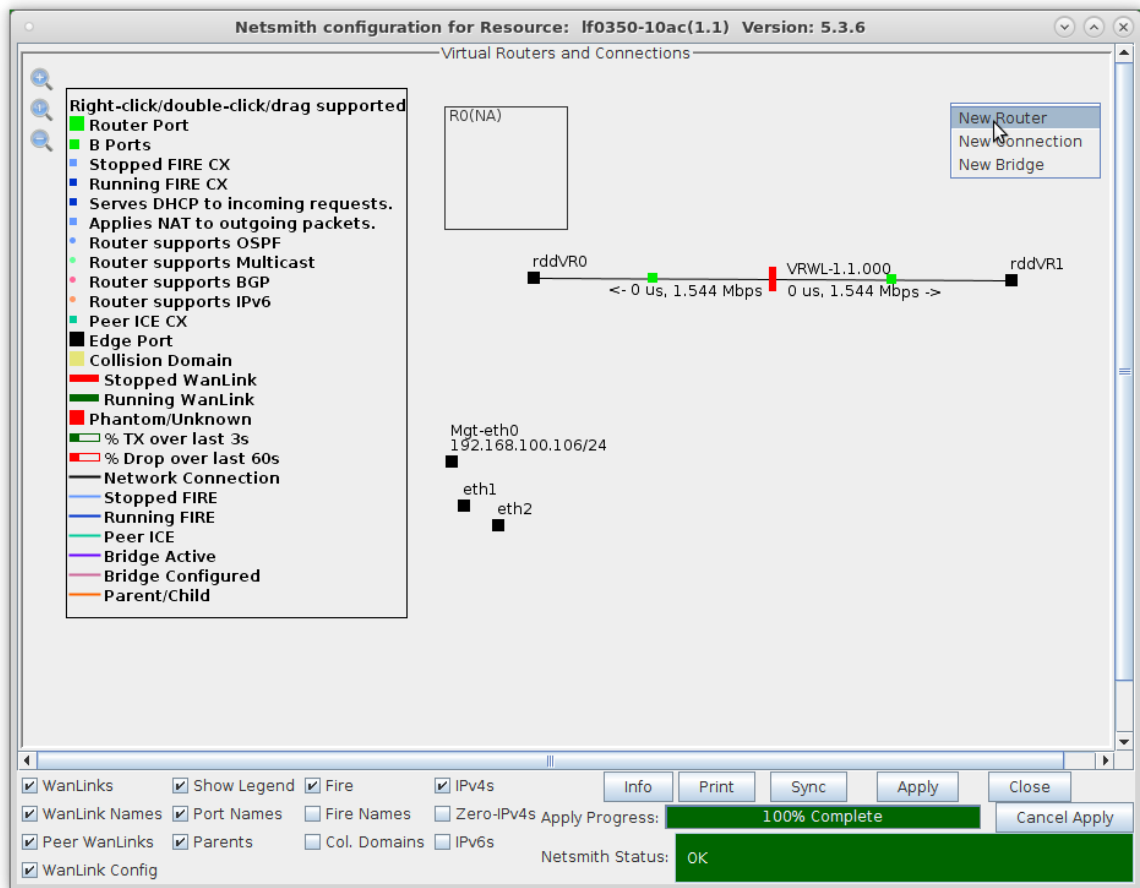


B. Accept defaults, or change the name, graphical size and notes about the Virtual Router



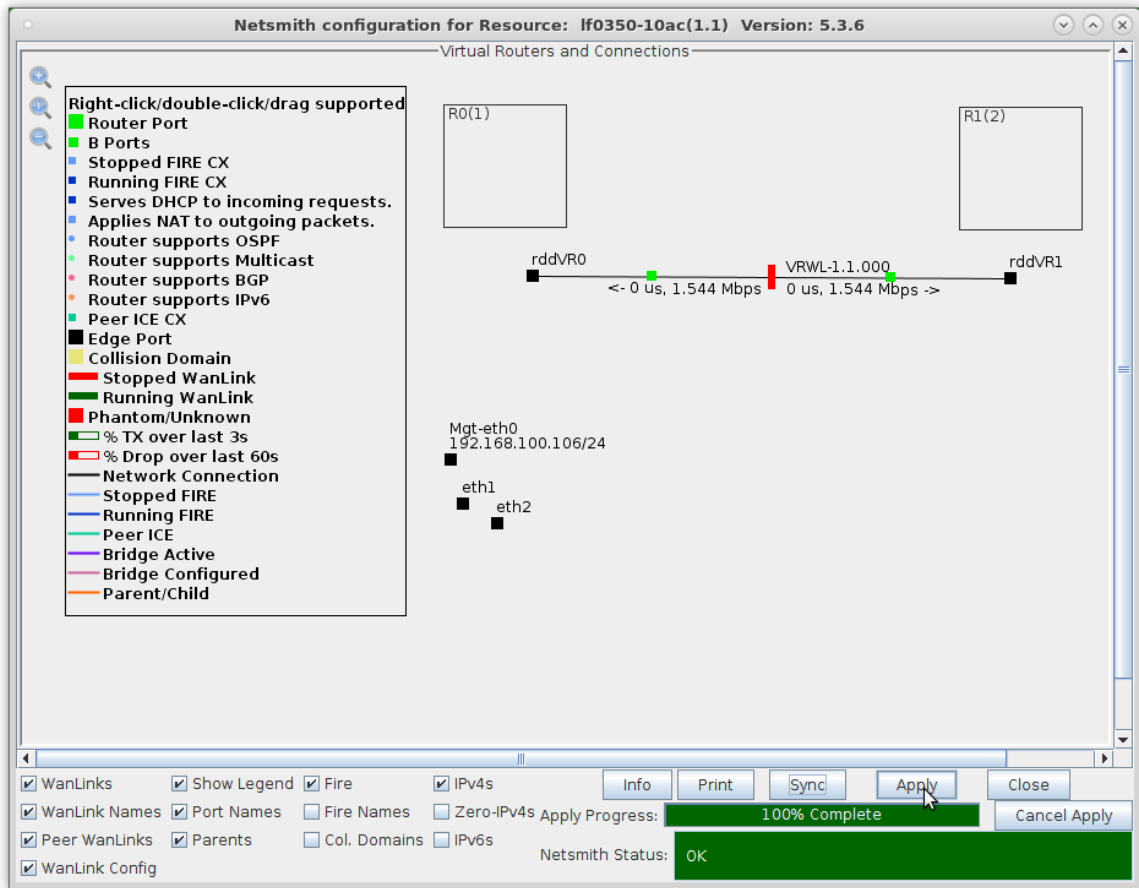
A. Click **OK** when done

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

D. Click the **Apply** button followed by the **Sync** button



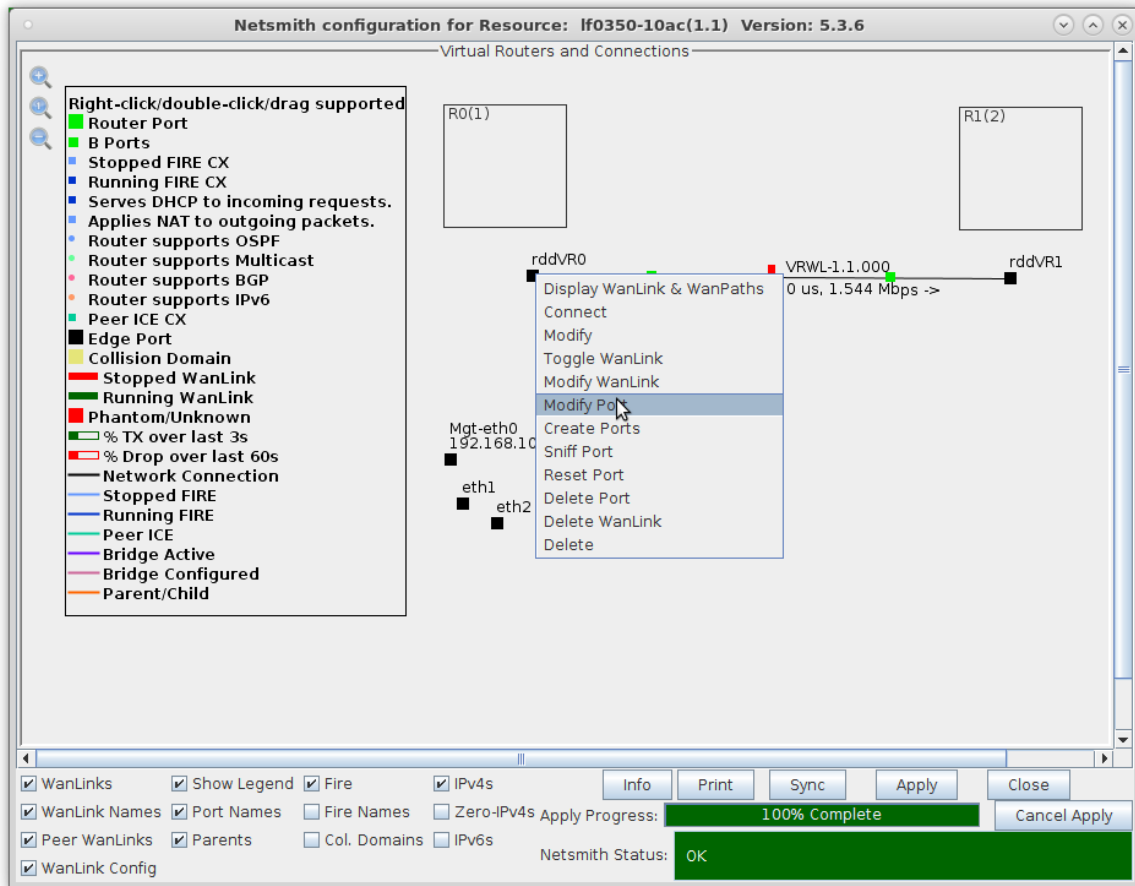
A. **NOTE:** Clicking **Sync** makes sure any changes are synchronized with the current database

B. Also, note the Netsmith Apply Progress bar displayed at the bottom of the Netsmith window

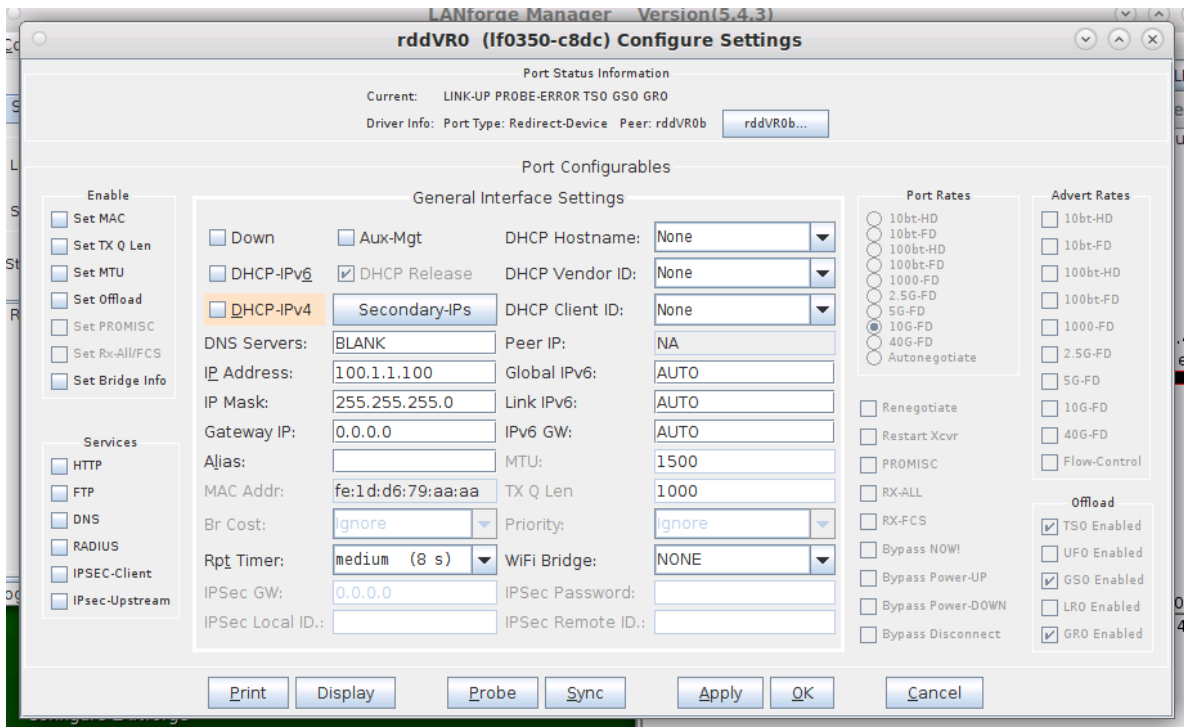
For more information see [LANforge-GUI User Guide: Netsmith](#)

3. Configure the ports on the ends of the WanLink.

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

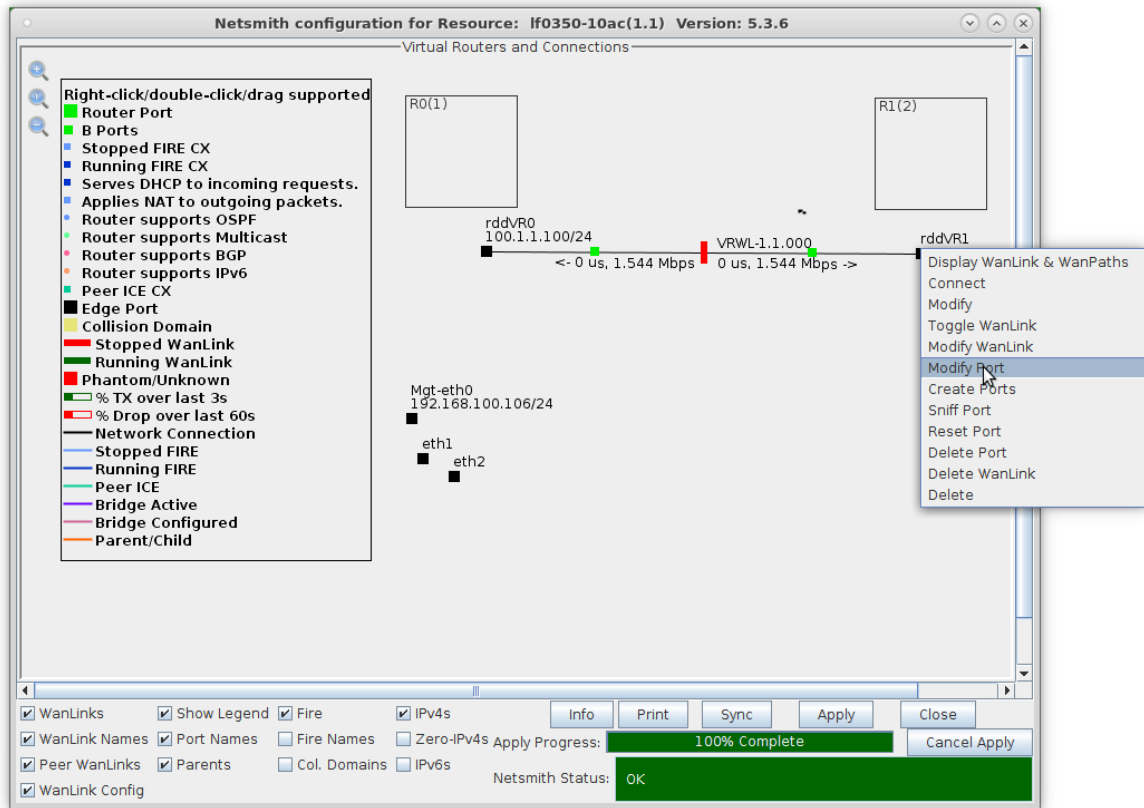


B. Assign an IP address and Network Mask

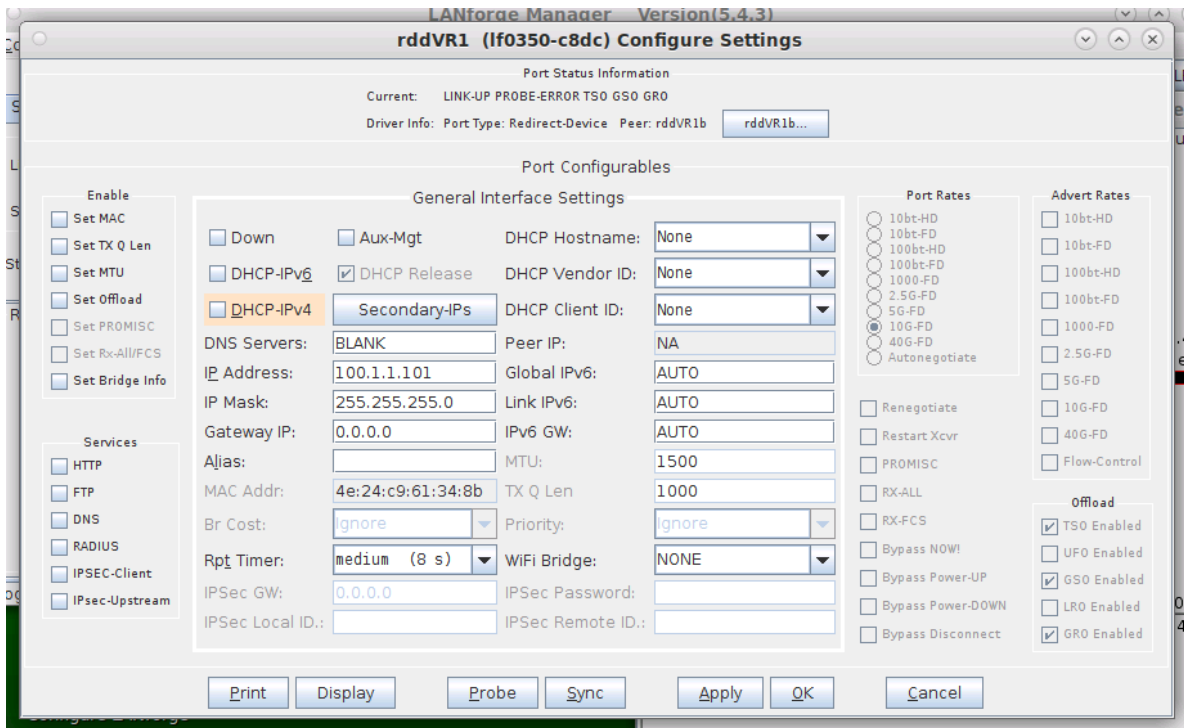


A. This example uses 10.1.1.100 and 255.255.255.0

C. Right-click port rddVR1 and select **Modify Port**



D. Assign an IP address and Network Mask

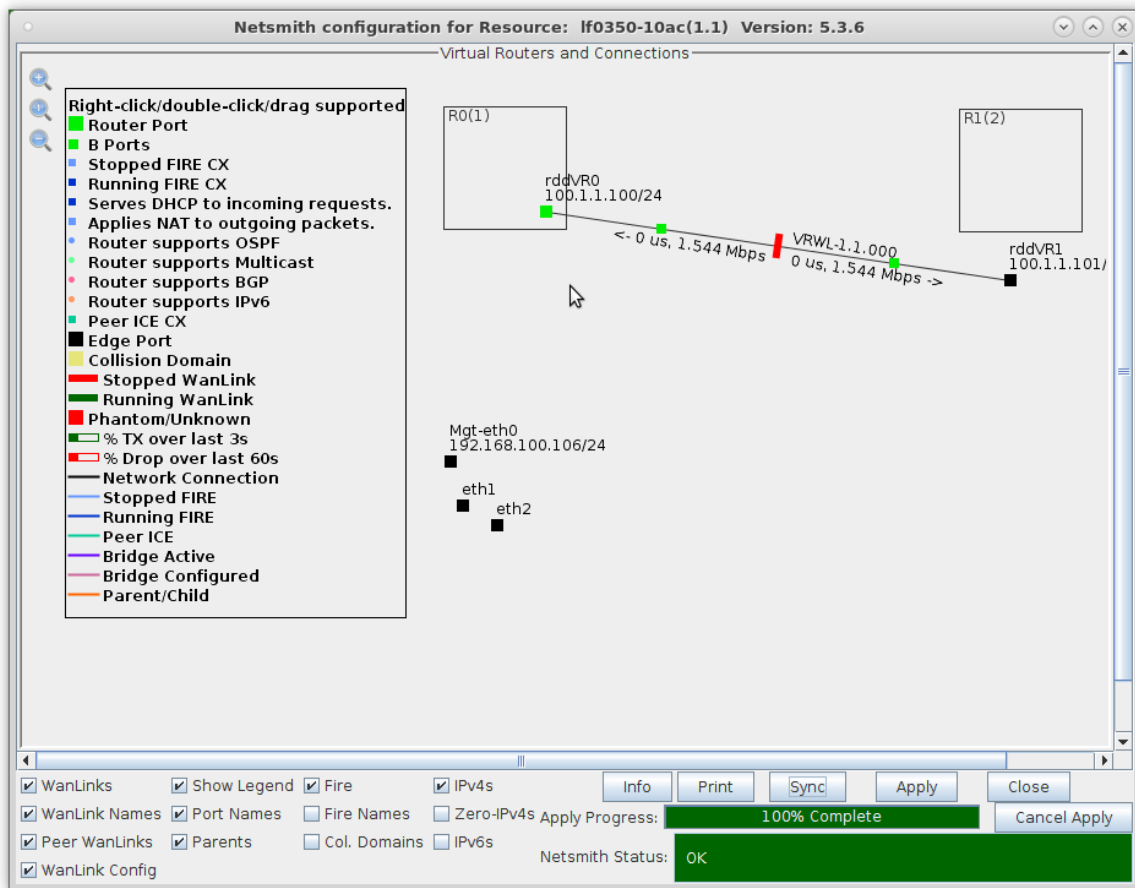


A. This example uses 10.1.1.101 and 255.255.255.0

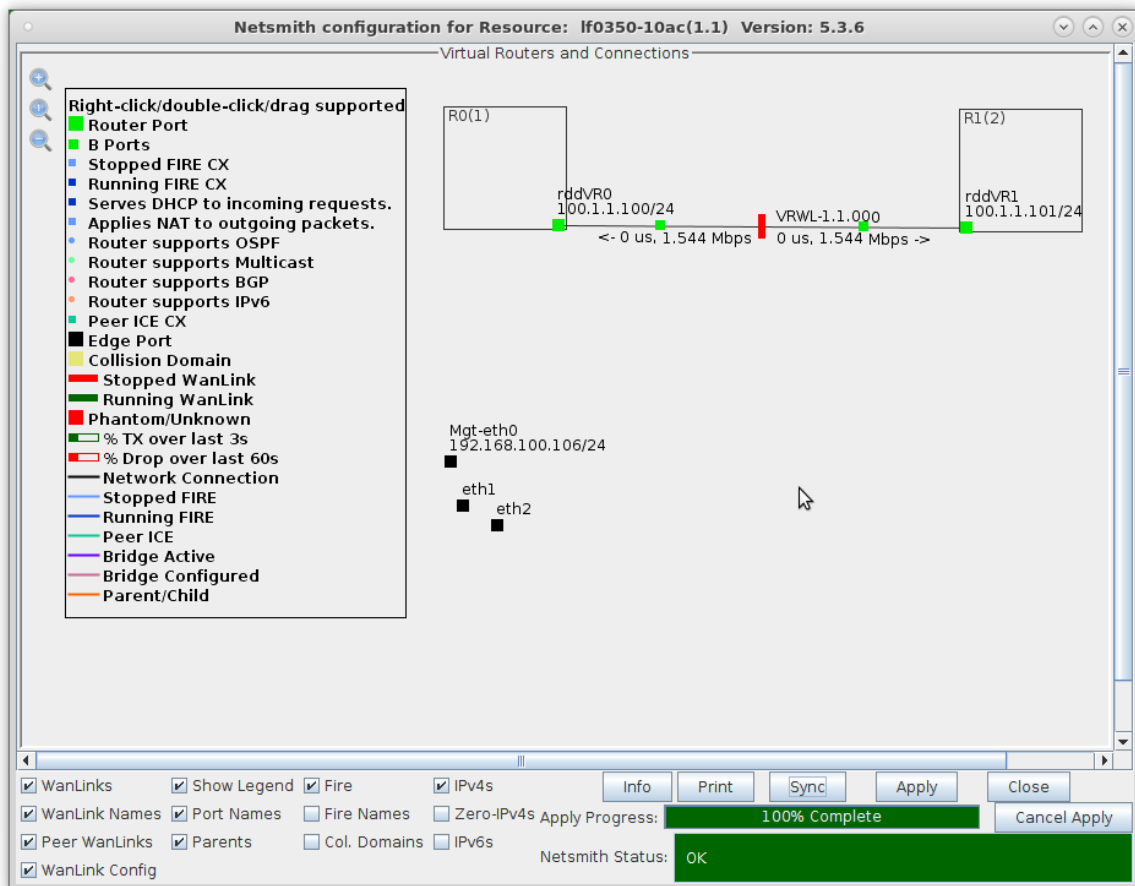
For more information see [LANforge-GUI User Guide: Netsmith](#)

4. Drag the ends of the WanLink into the Virtual Routers.

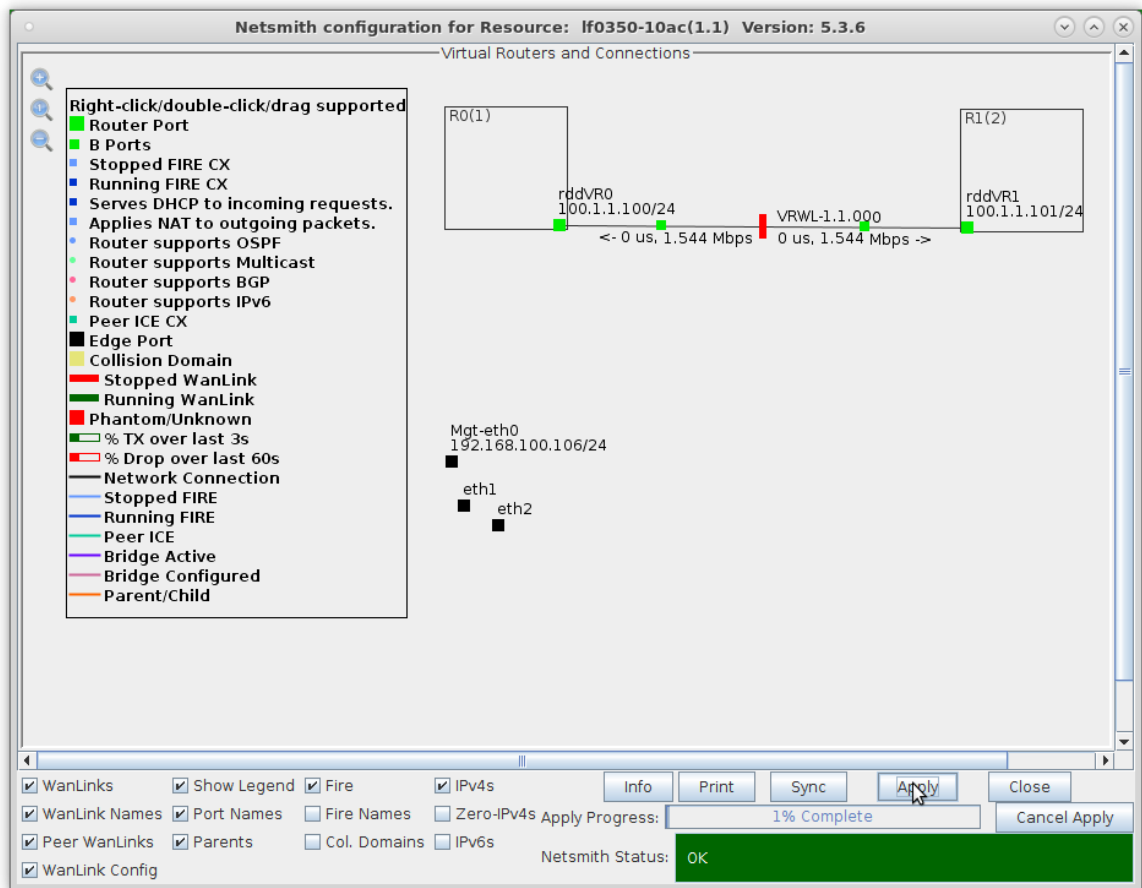
A. Left-click and drag rddVR0 into Router R0(1)



B. Left-click and drag rddVR1 into Router R1 (2)



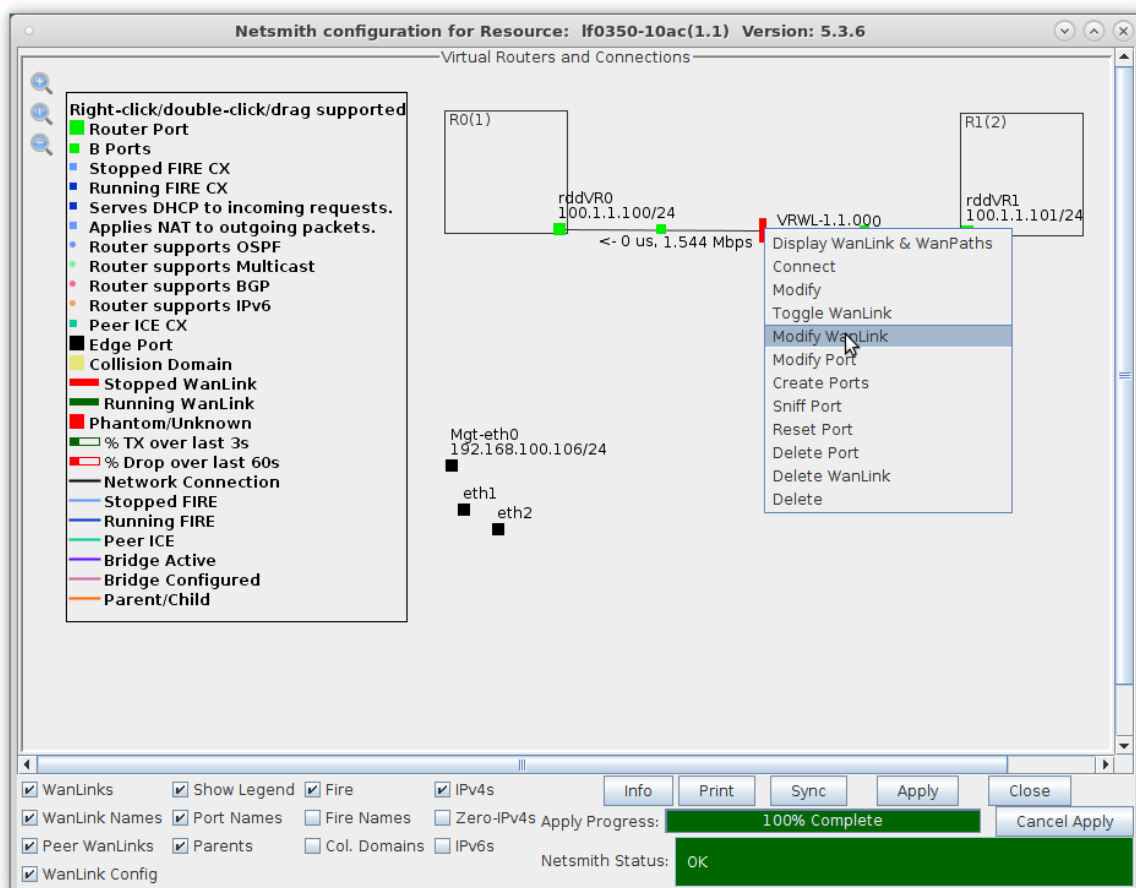
C. Click the **Apply** button at the bottom of the Netsmith window



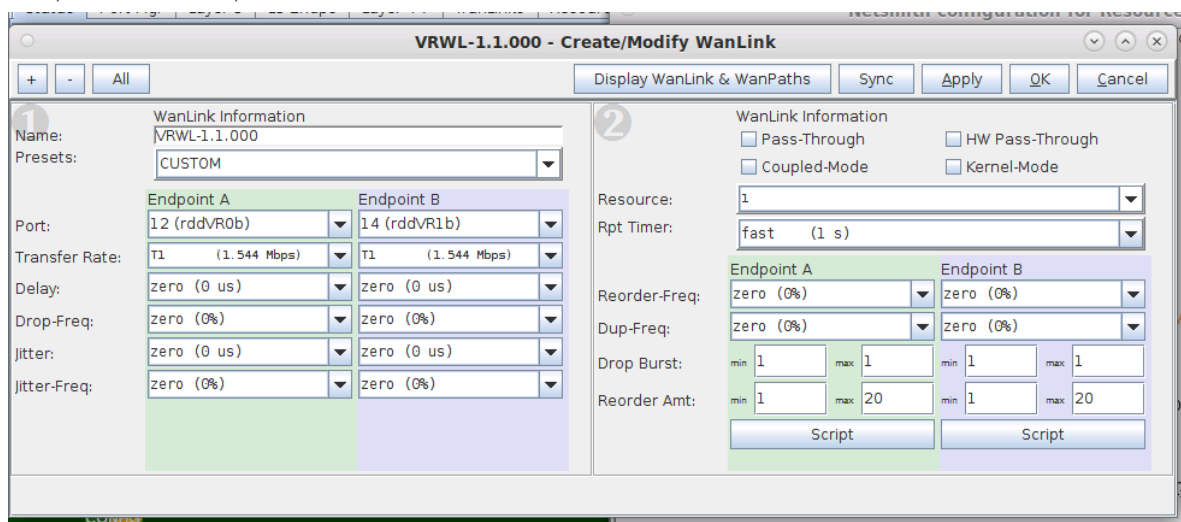
For more information see [LANforge-GUI User Guide: Netsmith](#)

5. Setup the Routed Mode WanLink characteristics.

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



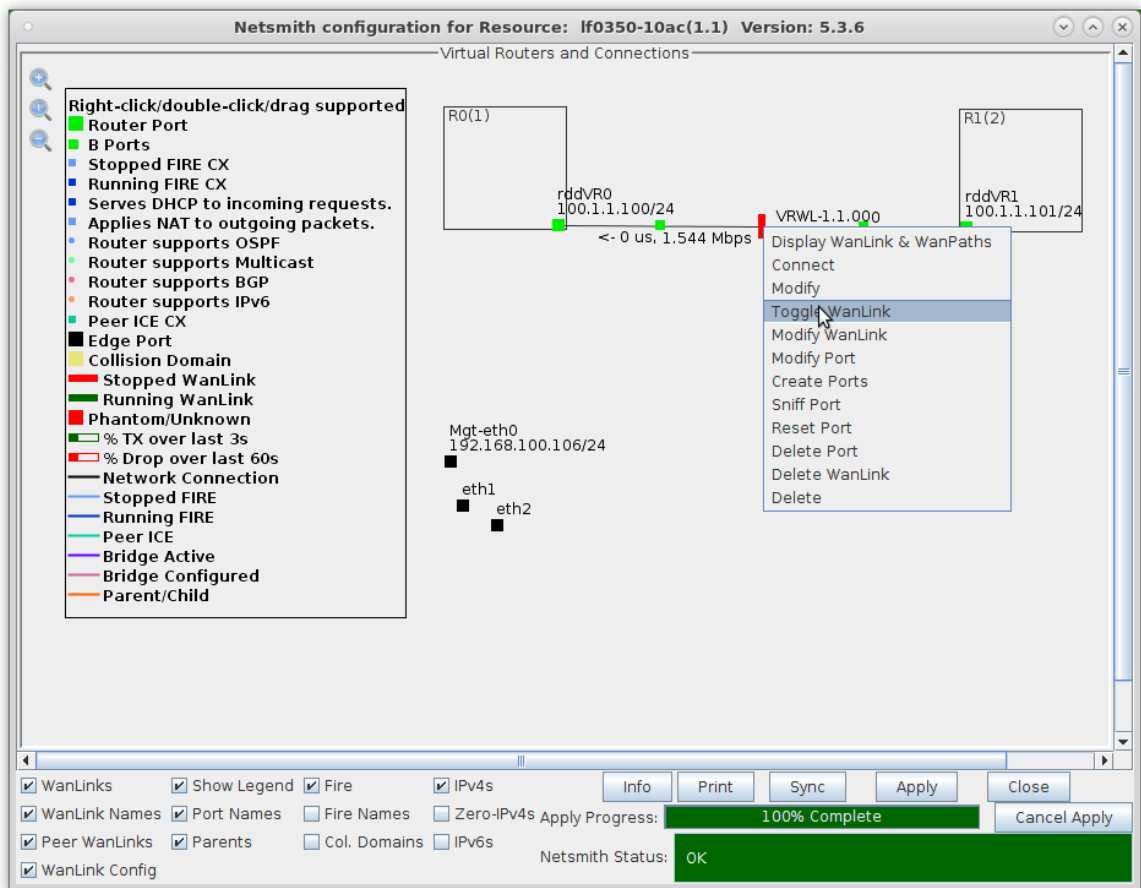
B. Verify that the B-side ports, rddVR0b and rddVR1b, are filled in



A. **NOTE:** Be sure to set the impairment, if any, and transfer rate

B. Click **OK** when done

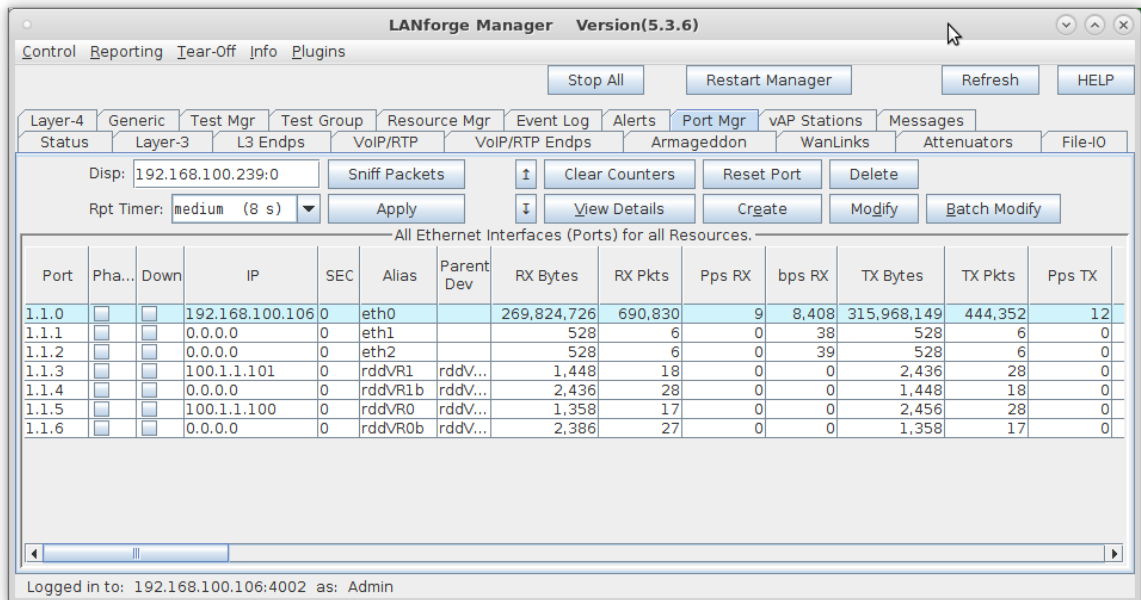
C. Right-click the WanLink and select **Toggle Wanlink** to set its status to Running (green)



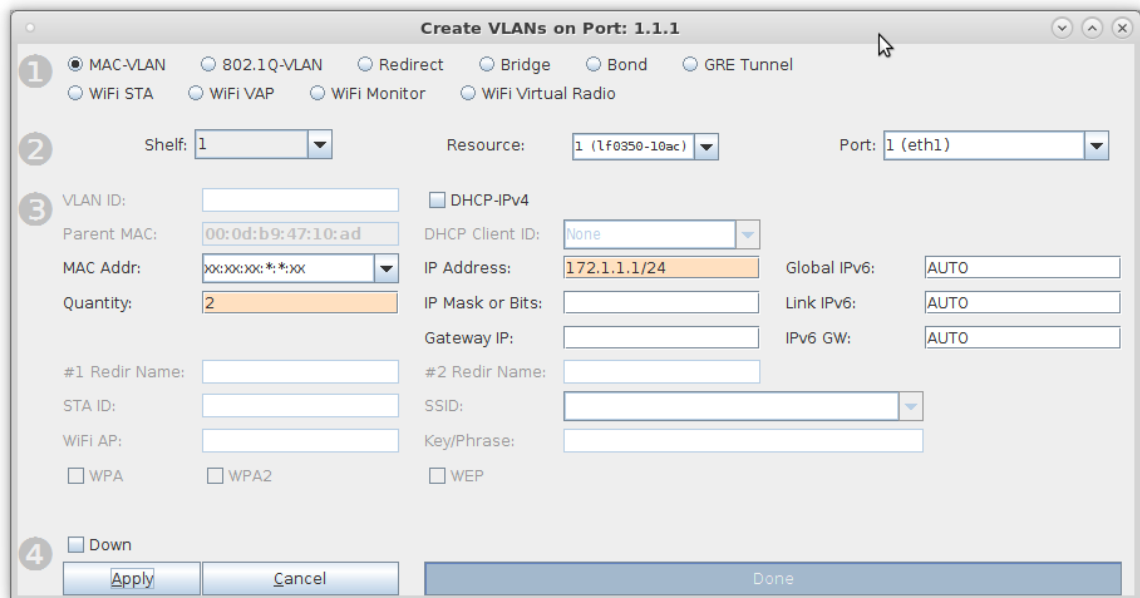
For more information see [LANforge-GUI User Guide: Netsmith](#)

6. Setup MAC VLANs.

A. Go to the **Port Mgr** tab, select eth1 and click **Create**



B. Select the **MAC-VLAN** button



Create VLANs on Port: 1.1.1

1 ☒ MAC-VLAN ☐ 802.1Q-VLAN ☐ Redirect ☐ Bridge ☐ Bond ☐ GRE Tunnel
☐ WiFi STA ☐ WiFi VAP ☐ WiFi Monitor ☐ WiFi Virtual Radio

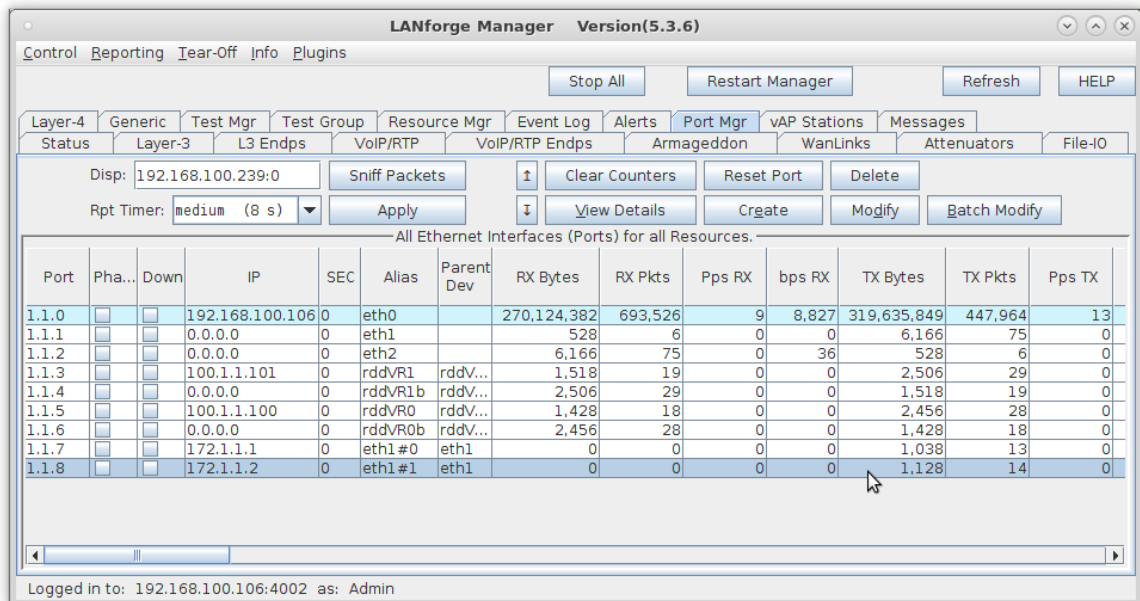
2 Shelf: 1 Resource: 1 (1f0350-10ac) Port: 1 (eth1)

3 VLAN ID: ☐ DHCP-IPv4
 Parent MAC: 00:0d:b9:47:10:ad DHCP Client ID: None
 MAC Addr: xx:xx:xx:*:*:xx IP Address: 172.1.1.1/24 Global IPv6: AUTO
 Quantity: 2 IP Mask or Bits: Link IPv6: AUTO
 Gateway IP: IPv6 GW: AUTO
 #1 Redir Name: #2 Redir Name:
 STA ID: SSID:
 WiFi AP: Key/Phrase:
☐ WPA ☐ WPA2 ☐ WEP

4 ☐ Down

- A. Set a MAC address that begins with 00 (Ex: 00:11:33:55:77:01)
- B. Set the Quantity to 2
- C. Set the IP Address to 172.1.1.1 and IP Mask to 255.255.255.0
- D. Leave the Gateway IP field blank
- E. Click **OK** when done

C. Select the MAC VLAN eth1 #1 and click **Modify**



LANforge Manager Version(5.3.6)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr vAP Stations Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators File-IO

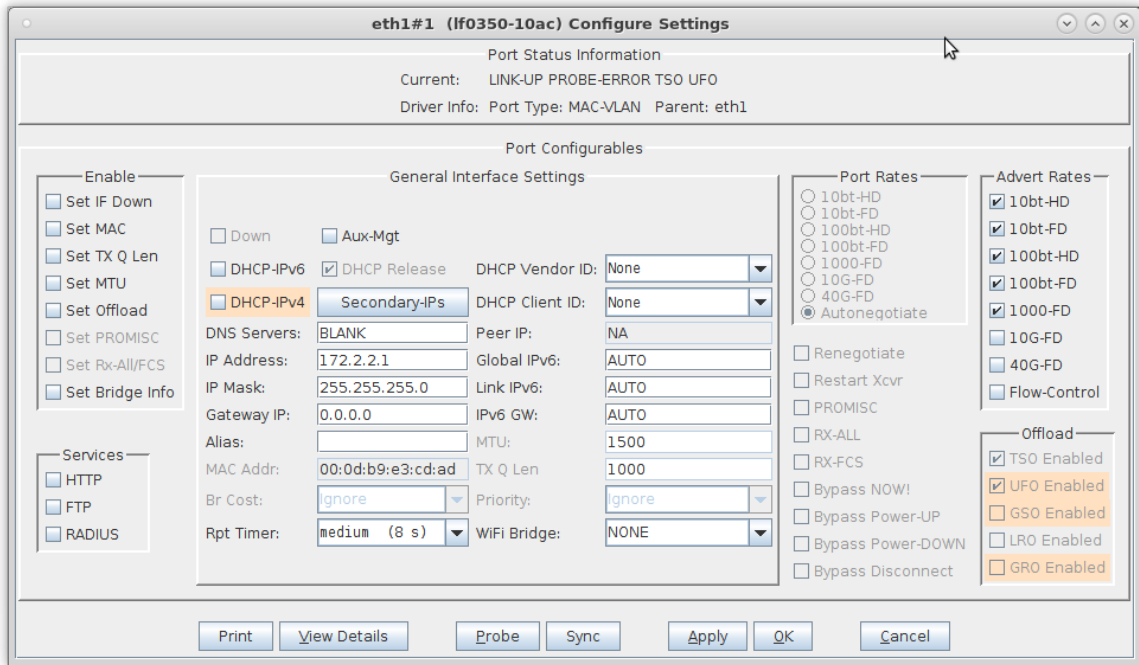
Disp: 192.168.100.239:0 Sniff Packets Clear Counters Reset Port Delete
 Rpt Timer: medium (8 s) Apply View Details Create Modify Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Pha...	Down	IP	SEC	Alias	Parent Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX
1.1.0			192.168.100.106	0	eth0		270,124,382	693,526	9	8,827	319,635,849	447,964	13
1.1.1			0.0.0.0	0	eth1		528	6	0	0	6,166	75	0
1.1.2			0.0.0.0	0	eth2		6,166	75	0	36	528	6	0
1.1.3			100.1.1.101	0	rddVR1	rddV...	1,518	19	0	0	2,506	29	0
1.1.4			0.0.0.0	0	rddVR1b	rddV...	2,506	29	0	0	1,518	19	0
1.1.5			100.1.1.100	0	rddVR0	rddV...	1,428	18	0	0	2,456	28	0
1.1.6			0.0.0.0	0	rddVR0b	rddV...	2,456	28	0	0	1,428	18	0
1.1.7			172.1.1.1	0	eth1 #0	eth1	0	0	0	0	1,038	13	0
1.1.8			172.1.1.2	0	eth1 #1	eth1	0	0	0	0	1,128	14	0

Logged in to: 192.168.100.106:4002 as: Admin

D. Set eth1#1 IP address to 172.2.2.1 and IP Mask to 255.255.255.0



The dialog box shows the configuration for the eth1#1 interface. The IP Address is set to 172.2.2.1 and the IP Mask is set to 255.255.255.0. The DHCP Release checkbox is checked. The Port Rates section shows Autonegotiate selected. The Advert Rates section shows 1000-FD selected. The Offload section shows TSO Enabled, UFO Enabled, GSO Enabled, and GRO Enabled. The Services section shows HTTP, FTP, and RADIUS. The Port Status Information shows Current: LINK-UP PROBE-ERROR TSO UFO and Driver Info: Port Type: MAC-VLAN Parent: eth1.

eth1#1 (If0350-10ac) Configure Settings

Port Status Information
Current: LINK-UP PROBE-ERROR TSO UFO
Driver Info: Port Type: MAC-VLAN Parent: eth1

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

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: 172.2.2.1 Global IPv6: AUTO
IP Mask: 255.255.255.0 Link IPv6: AUTO
Gateway IP: 0.0.0.0 IPv6 GW: AUTO
Alias: MTU: 1500
MAC Addr: 00:0d:b9:e3:cd:ad TX Q Len: 1000
Br Cost: ignore Priority: ignore
Rpt Timer: medium (8 s) WiFi Bridge: NONE

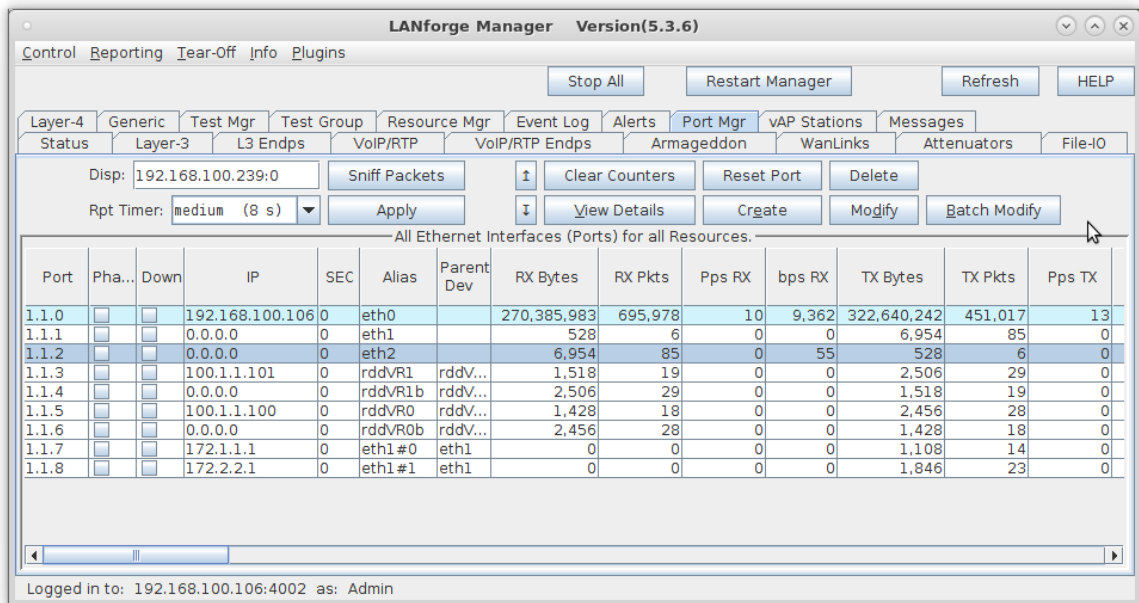
Port Rates
☐ 10bt-HD
☐ 10bt-FD
☐ 100bt-HD
☐ 100bt-FD
☐ 1000-FD
☐ 10G-FD
☐ 40G-FD
☒ Autonegotiate
☐ Renegotiate
☐ Restart Xcvr
☐ PROMISC
☐ RX-ALL
☐ RX-FCS
☐ Bypass NOW!
☐ Bypass Power-UP
☐ Bypass Power-DOWN
☐ Bypass Disconnect

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

Print View Details Probe Sync Apply OK Cancel

E. Select eth2 and click **Create**



The LANforge Manager interface shows a table of Ethernet interfaces. The table has columns for Port, Phase, Down, IP, SEC, Alias, Parent Dev, RX Bytes, RX Pkts, Pps RX, bps RX, TX Bytes, TX Pkts, and Pps TX. The interface is currently showing the 'Port Mgr' tab. The 'Create' button is visible in the top right of the interface.

LANforge Manager Version(5.3.6)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr vAP Stations Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators File-IO

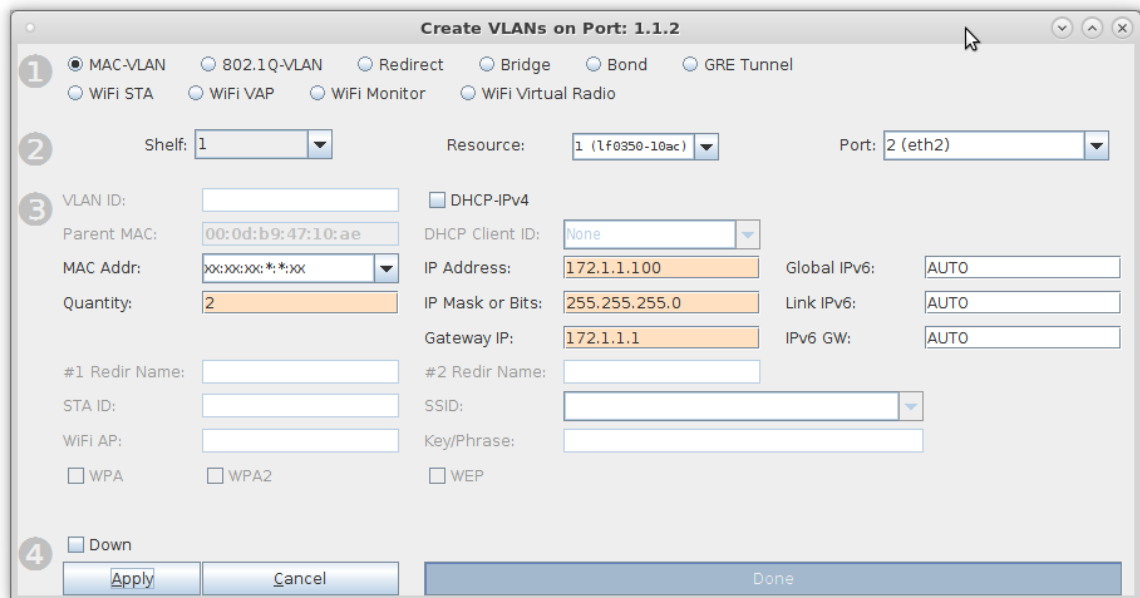
Disp: 192.168.100.239:0 Sniff Packets Clear Counters Reset Port Delete
Rpt Timer: medium (8 s) Apply View Details Create Modify Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Pha...	Down	IP	SEC	Alias	Parent Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX
1.1.0			192.168.100.106	0	eth0		270,385,983	695,978	10	9,362	322,640,242	451,017	13
1.1.1			0.0.0.0	0	eth1		528	6	0	0	6,954	85	0
1.1.2			0.0.0.0	0	eth2		6,954	85	0	55	528	6	0
1.1.3			100.1.1.101	0	rddVR1	rddV...	1,518	19	0	0	2,506	29	0
1.1.4			0.0.0.0	0	rddVR1b	rddV...	2,506	29	0	0	1,518	19	0
1.1.5			100.1.1.100	0	rddVR0	rddV...	1,428	18	0	0	2,456	28	0
1.1.6			0.0.0.0	0	rddVR0b	rddV...	2,456	28	0	0	1,428	18	0
1.1.7			172.1.1.1	0	eth1#0	eth1	0	0	0	0	1,108	14	0
1.1.8			172.2.2.1	0	eth1#1	eth1	0	0	0	0	1,846	23	0

Logged in to: 192.168.100.106:4002 as: Admin

F. Select the **MAC-VLAN** button



Create VLANs on Port: 1.1.2

1 ☒ MAC-VLAN ☐ 802.1Q-VLAN ☐ Redirect ☐ Bridge ☐ Bond ☐ GRE Tunnel
☐ WiFi STA ☐ WiFi VAP ☐ WiFi Monitor ☐ WiFi Virtual Radio

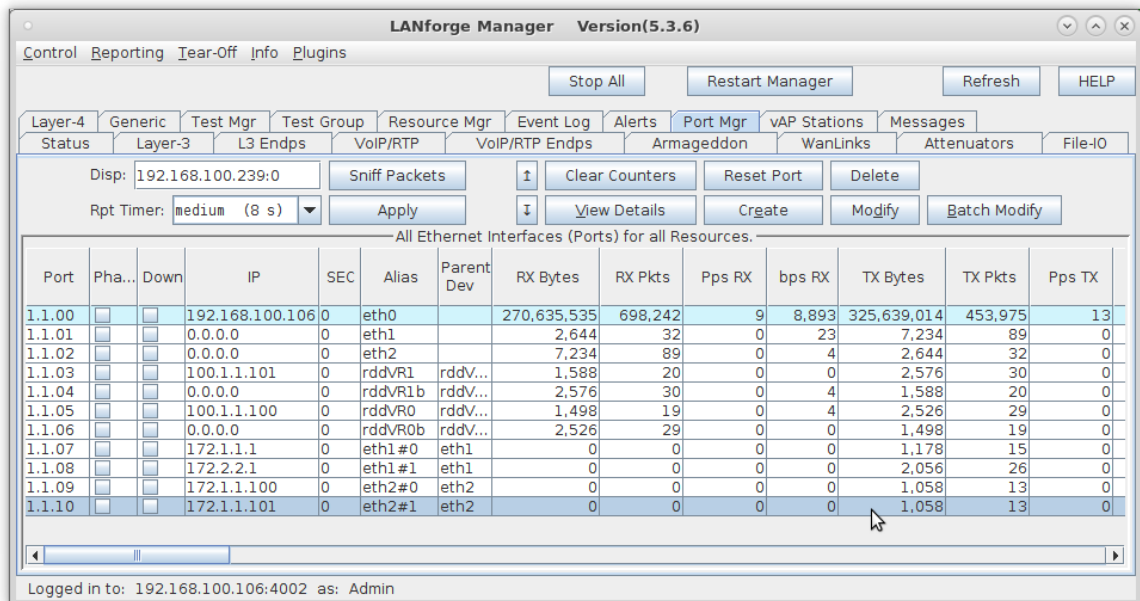
2 Shelf: 1 Resource: 1 (1f0350-10ac) Port: 2 (eth2)

3 VLAN ID: ☐ DHCP-IPv4
 Parent MAC: 00:0d:b9:47:10:ae DHCP Client ID: None
 MAC Addr: xx:xx:xx:*:*:xx IP Address: 172.1.1.100 Global IPv6: AUTO
 Quantity: 2 IP Mask or Bits: 255.255.255.0 Link IPv6: AUTO
 Gateway IP: 172.1.1.1 IPv6 GW: AUTO
 #1 Redir Name: #2 Redir Name:
 STA ID: SSID:
 WiFi AP: Key/Phrase:
☐ WPA ☐ WPA2 ☐ WEP

4 ☐ Down

- A. Set a MAC address that begins with 00 (Ex: 00:22:44:66:88:01)
- B. Set the Quantity to 2
- C. Set the IP Address to 172.1.1.100 and IP Mask to 255.255.255.0
- D. Set the Gateway IP to 172.1.1.1
- E. Click **OK** when done

G. Select the MAC VLAN eth2#1 and click **Modify**



LANforge Manager Version(5.3.6)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr vAP Stations Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators File-IO

Disp: 192.168.100.239:0 Sniff Packets Clear Counters Reset Port Delete
 Rpt Timer: medium (8 s) Apply View Details Create Modify Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Pha...	Down	IP	SEC	Alias	Parent Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX
1.1.00			192.168.100.106	0	eth0		270,635,535	698,242	9	8,893	325,639,014	453,975	13
1.1.01			0.0.0.0	0	eth1		2,644	32	0	23	7,234	89	0
1.1.02			0.0.0.0	0	eth2		7,234	89	0	4	2,644	32	0
1.1.03			100.1.1.101	0	rddVR1	rddV...	1,588	20	0	0	2,576	30	0
1.1.04			0.0.0.0	0	rddVR1b	rddV...	2,576	30	0	4	1,588	20	0
1.1.05			100.1.1.100	0	rddVR0	rddV...	1,498	19	0	4	2,526	29	0
1.1.06			0.0.0.0	0	rddVR0b	rddV...	2,526	29	0	0	1,498	19	0
1.1.07			172.1.1.1	0	eth1 #0	eth1	0	0	0	0	1,178	15	0
1.1.08			172.2.2.1	0	eth1 #1	eth1	0	0	0	0	2,056	26	0
1.1.09			172.1.1.100	0	eth2 #0	eth2	0	0	0	0	1,058	13	0
1.1.10			172.1.1.101	0	eth2 #1	eth2	0	0	0	0	1,058	13	0

Logged in to: 192.168.100.106:4002 as: Admin

H. Set eth2#1 IP address to 172.2.2.100, IP Mask to 255.255.255.0 and Gateway IP to 172.2.2.1

eth2#1 (If0350-10ac) Configure Settings

Port Status Information
Current: LINK-UP PROBE-ERROR TSO UFO
Driver Info: Port Type: MAC-VLAN Parent: eth2

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

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: 172.2.2.100 Global IPv6: AUTO

IP Mask: 255.255.255.0 Link IPv6: AUTO

Gateway IP: 172.2.2.1 IPv6 GW: AUTO

Alias: MTU: 1500

MAC Addr: 00:0d:b9:6b:a3:ae 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

Renegotiate ☐

Restart Xcvr ☐

PROMISC ☐

RX-ALL ☐

RX-FCS ☐

Bypass NOW! ☐

Bypass Power-UP ☐

Bypass Power-DOWN ☐

Bypass Disconnect ☐

Advert Rates

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

Offload

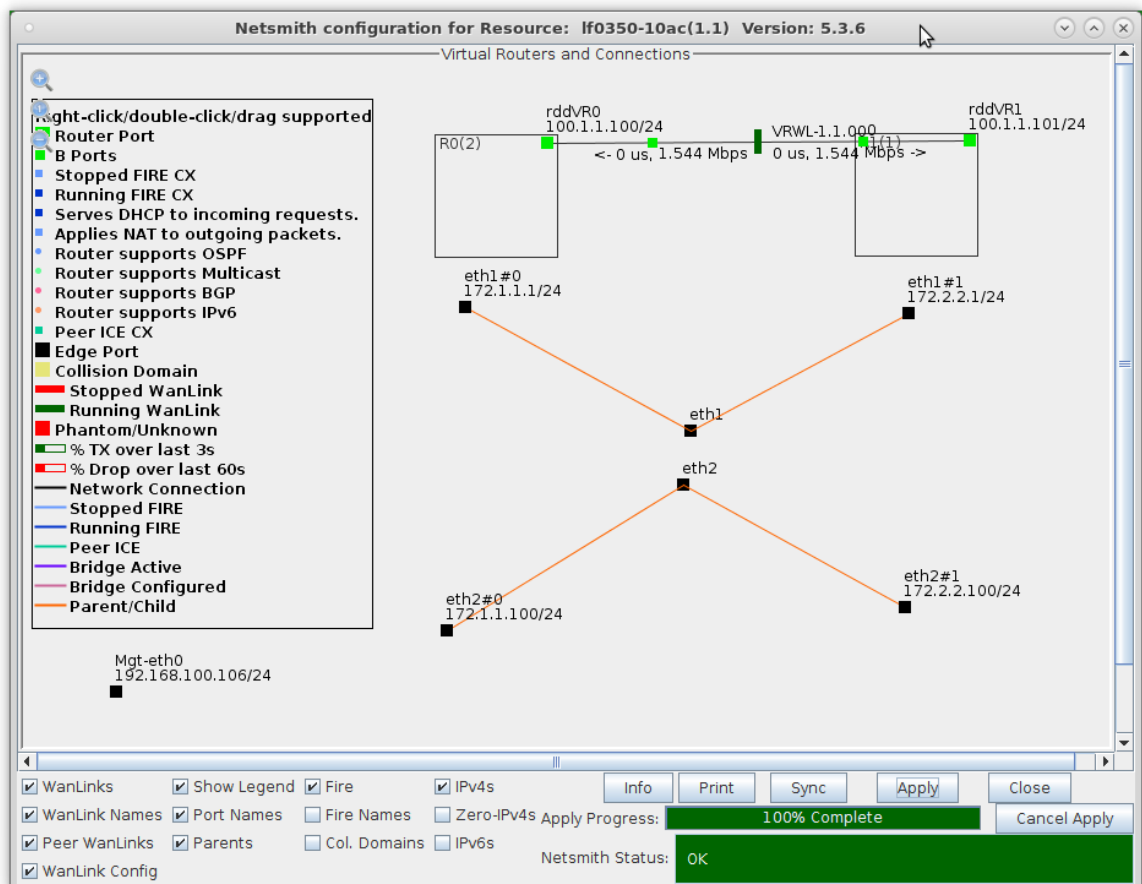
- ☒ TSO Enabled
- ☒ UFO Enabled
- ☐ GSO Enabled
- ☐ LRO Enabled
- ☐ GRO Enabled

Print View Details Probe Sync Apply OK Cancel

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

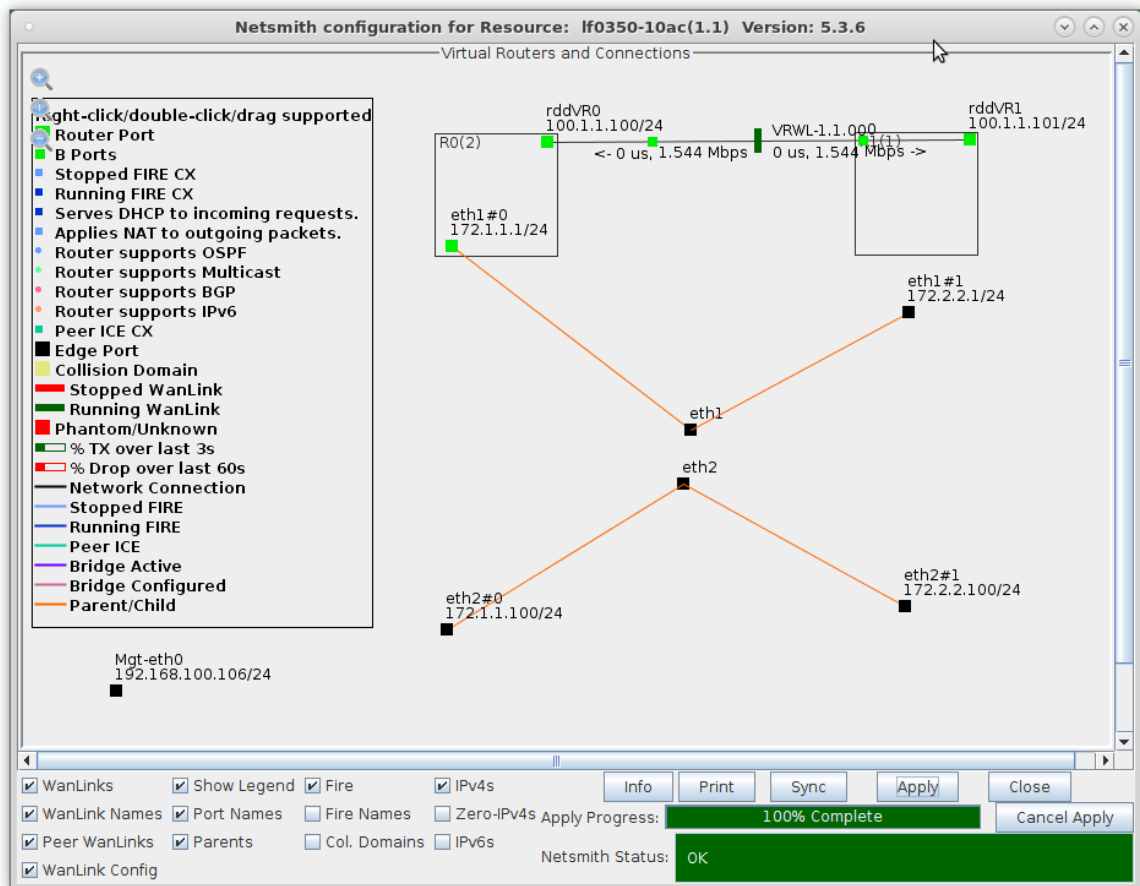
7. Configure Netsmith.

- A. After clicking on the sync button, move the ports on the Netsmith window to be more clearly visible. **Eth1 and eth2 are connected via a loopback cabel**

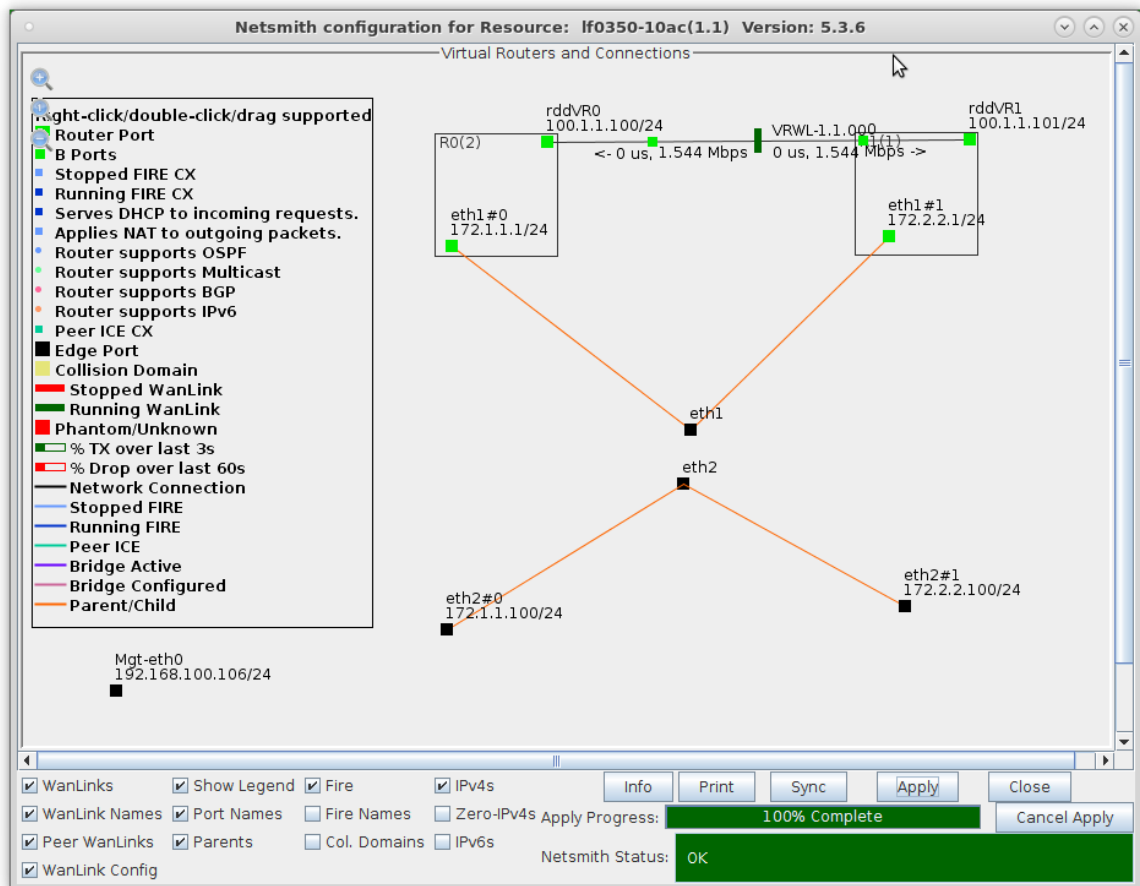


- A. **NOTE:** Be sure to click **Apply** after moving objects so that their new positions are saved to the database

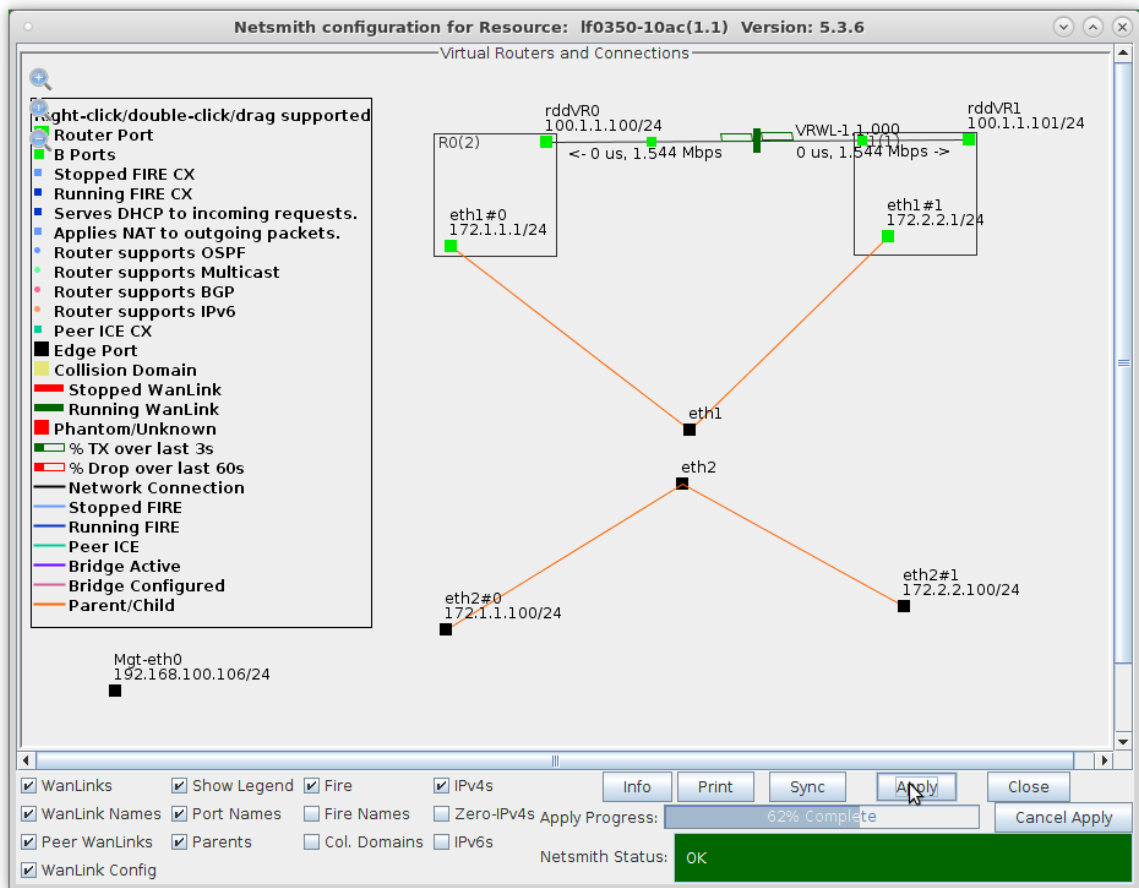
B. Drag eth1#0 into Router R0(1)



C. Drag eth1#1 into Router R1(2)



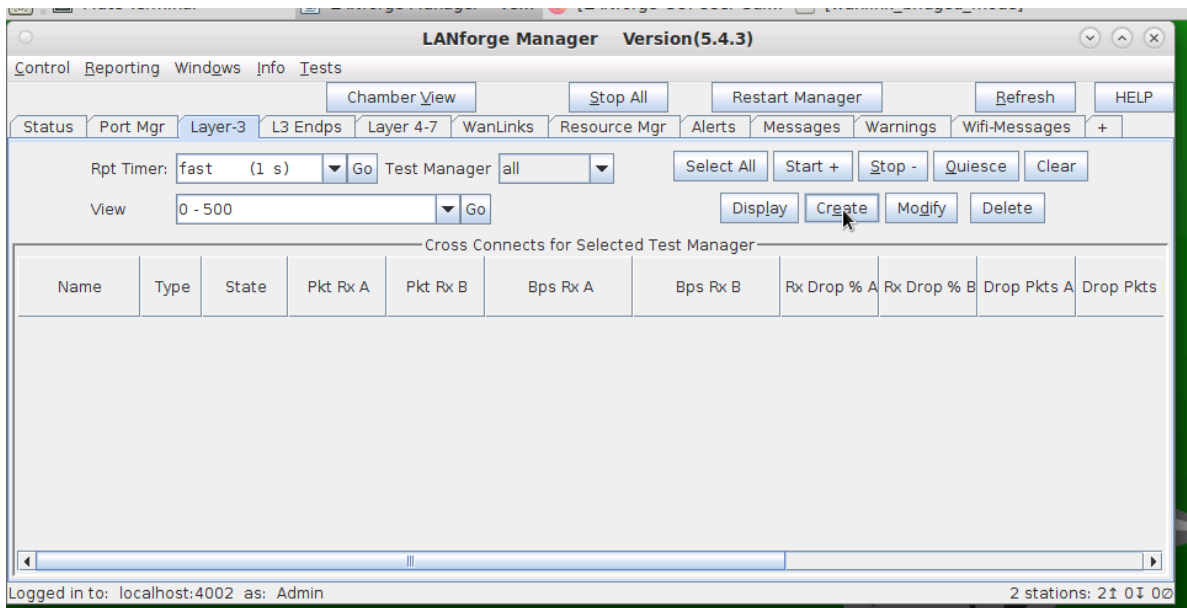
D. Click **Apply** in the Netsmith window



- LANforge is now ready to accept incoming traffic on eth0, the single physical port that is connected to a Routed Mode WanLink
- Ports eth0 and eth1 are physically connected via a loopback cable in this example. MAC VLANs on eth1 are configured to generate test traffic to the Routed Mode WanLink

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

- Setup a Layer-3 UDP connection between MAC VLANs eth2#0 and eth2#1.
 - Go to the **Layer-3** tab and click **Create**



B. Set Endpoint A to be eth2#0 and Endpoint B to be eth2#1

udp-cx - Create/Modify Cross Connect

Buttons: +, -, All, Display, Sync, Batch-Create, Apply, OK, Cancel

1 Cross-Connect

CX Name:

CX Type:

Endpoint A	Endpoint B
Resource: <input type="text" value="1 (1f0350-10ac)"/>	Resource: <input type="text" value="1 (1f0350-10ac)"/>
Port: <input type="text" value="9 (eth2#0)"/>	Port: <input type="text" value="10 (eth2#1)"/>
Min Tx Rate: <input type="text" value="1024000 (1.024 Mbps)"/>	Min Tx Rate: <input type="text" value="1024000 (1.024 Mbps)"/>
Max Tx Rate: <input type="text" value="Same"/>	Max Tx Rate: <input type="text" value="Same"/>
Min PDU Size: <input type="text" value="UDP Pld (1,472 B)"/>	Min PDU Size: <input type="text" value="UDP Pld (1,472 B)"/>
Max PDU Size: <input type="text" value="Same"/>	Max PDU Size: <input type="text" value="Same"/>
IP ToS: <input type="text" value="Best Effort (0)"/>	IP ToS: <input type="text" value="Best Effort (0)"/>
Pkts To Send: <input type="text" value="Infinite"/>	Pkts To Send: <input type="text" value="Infinite"/>

2 Cross-Connect

Report Timer:

Endpoint A	Endpoint B
Pld Pattern: <input type="text" value="increasing"/>	Pld Pattern: <input type="text" value="increasing"/>
Min IP Port: <input type="text" value="AUTO"/>	Min IP Port: <input type="text" value="AUTO"/>
Max IP Port: <input type="text" value="Same"/>	Max IP Port: <input type="text" value="Same"/>
Min Duration: <input type="text" value="Forever"/>	Min Duration: <input type="text" value="Forever"/>
Max Duration: <input type="text" value="Same"/>	Max Duration: <input type="text" value="Same"/>
Min Reconn: <input type="text" value="0 (0 ms)"/>	Min Reconn: <input type="text" value="0 (0 ms)"/>
Max Reconn: <input type="text" value="Same"/>	Max Reconn: <input type="text" value="Same"/>
Multi-Conn: <input type="text" value="Normal (0)"/>	Multi-Conn: <input type="text" value="Normal (0)"/>

Buttons: Script, Thresholds

A. Enter the CX name then set the CX Type to LANforge UDP and the Report Timer to 1000

B. Set the Min/Max Tx Rate to 1024000 and the Min/Max Pkt Size to 1472

C. Select the new connection and click **Start**

LANforge Manager Version(5.3.6)

Control Reporting Tear-Off Info Plugins

Buttons: Stop All, Restart Manager, Refresh, HELP

Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr vAP Stations Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators File-I/O

Rpt Timer: Go Test Manager:

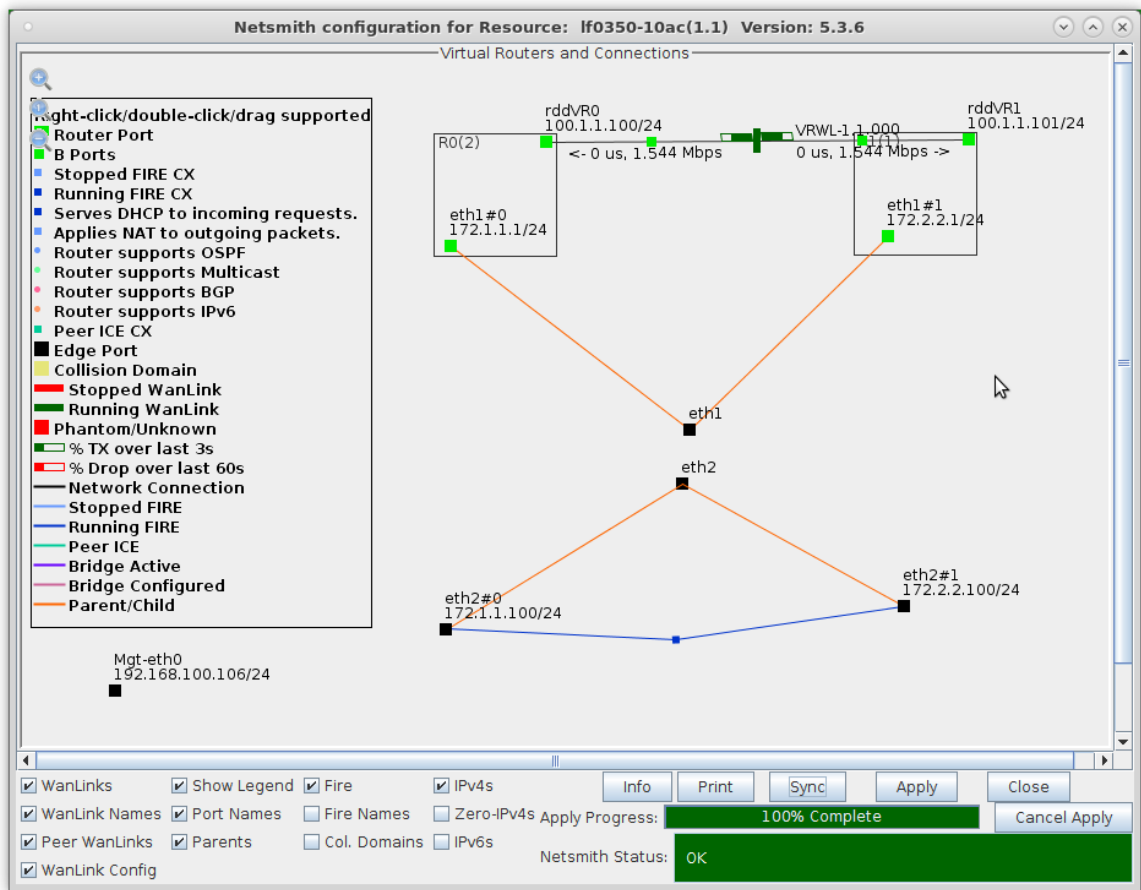
View: Go

Buttons: Select All, Start, Stop, Quiesce, Clear, Display, Create, Modify, Delete

Name	Type	State	Pkt Rx A	Pkt Rx B	Bps Rx A	Bps Rx B	Rx Drop % A	Rx Drop % B	Drop Pkts A	Drop Pkt:
udp-cx	LF/UDP	Run	3,616	3,625	1,022,598	1,022,614	0	0	0	

Logged in to: 192.168.100.106:4002 as: Admin

D. NetSmith now shows the new connection and traffic flowing through the Routed Mode WanLink



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

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