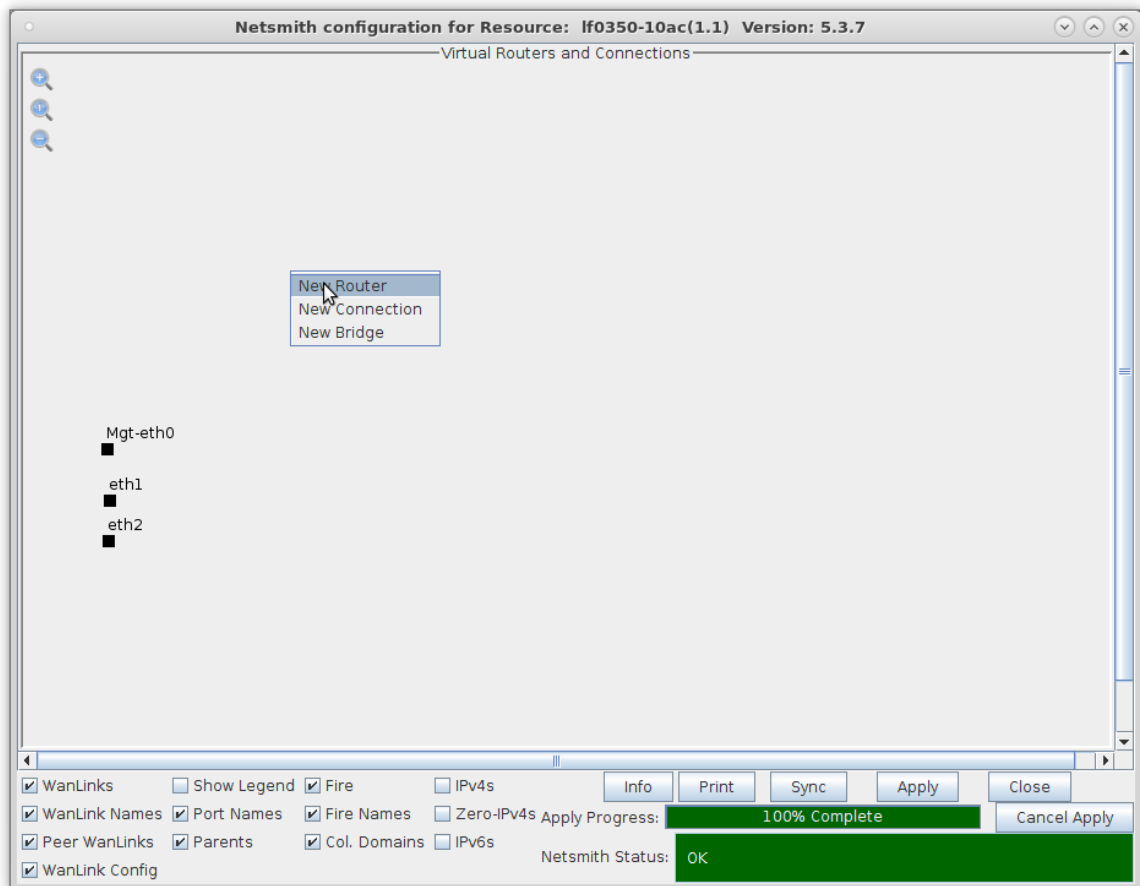


## Virtual Router with NAT

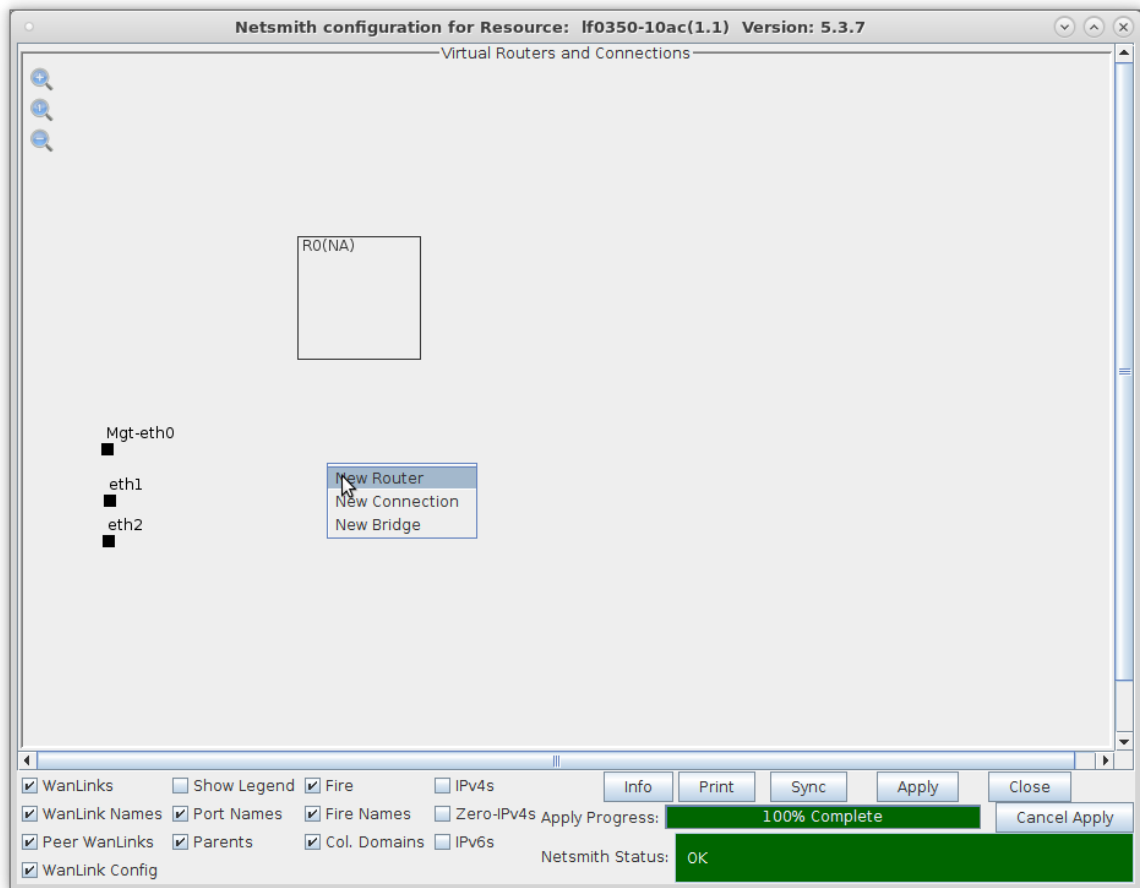
**Goal:** Setup a Virtual Router with one interface performing NAT on outgoing traffic.

In this test scenario, a pair of Virtual Routers are connected with a Redirected Interface connection with one side of the connection performing NAT on outgoing traffic. Two additional Redirected Interface connections are configured to pass traffic and demonstrate NAT.

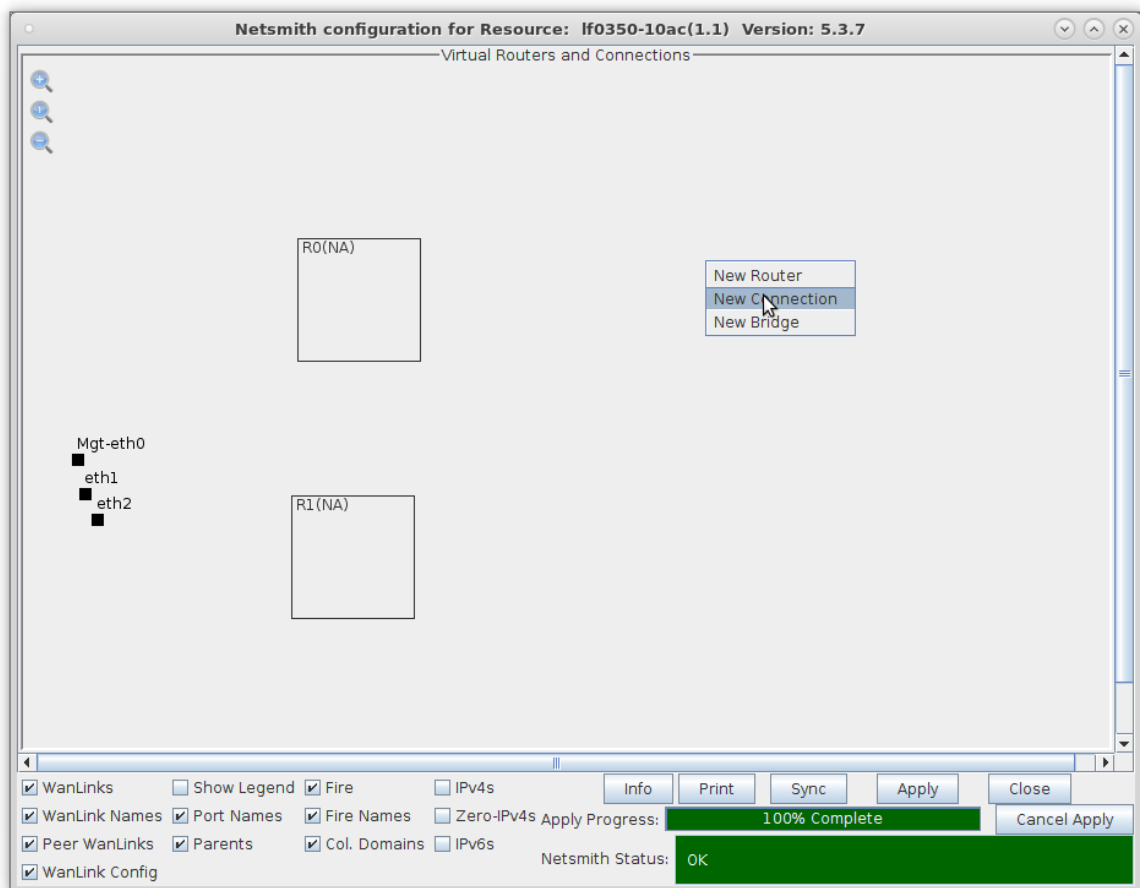
1. Setup two Virtual Routers and three Netsmith Connections.
  - A. Right-click inside the Netsmith window and select **New Router**



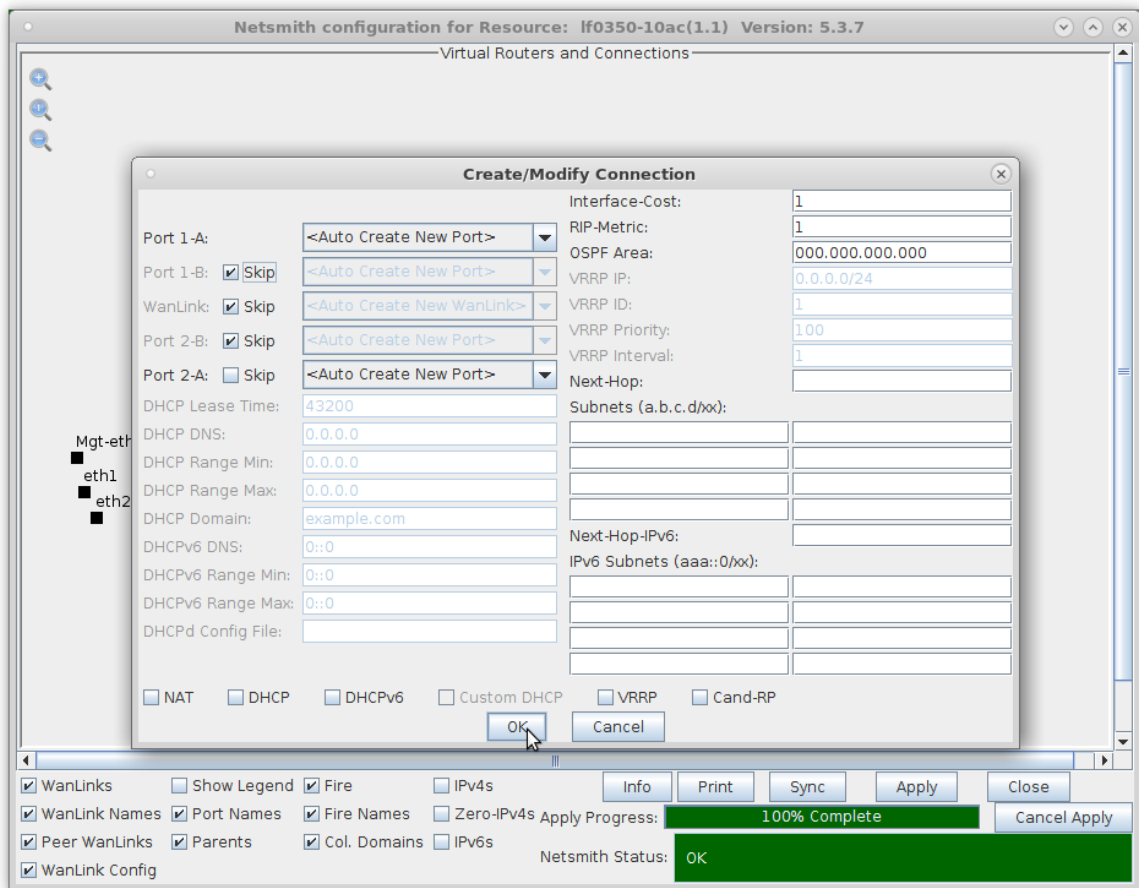
B. Repeat to create another virtual router



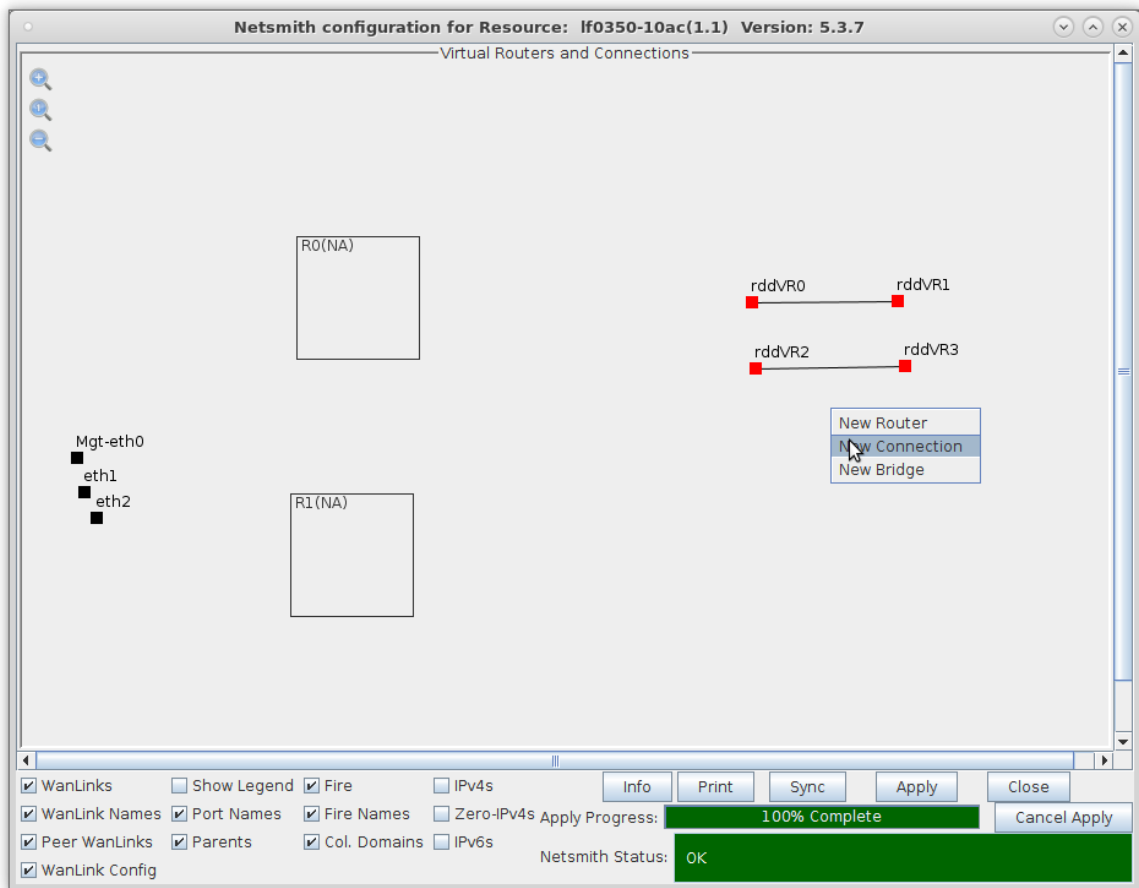
C. Right-click inside the Netsmith window and select **New Connection**



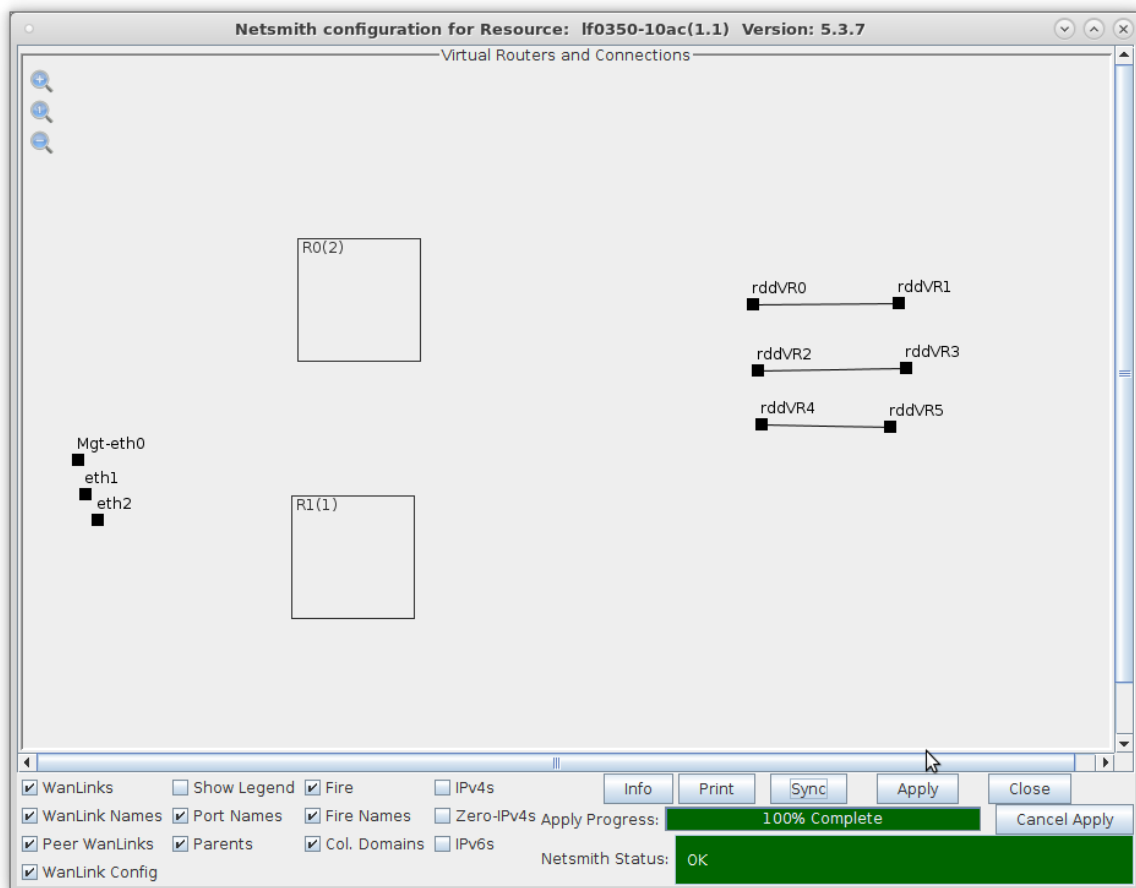
D. Select the 'Skip' option on Port 1-B, WanLink and Port 2-B, then click **OK**



E. Repeat and create two more connections



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

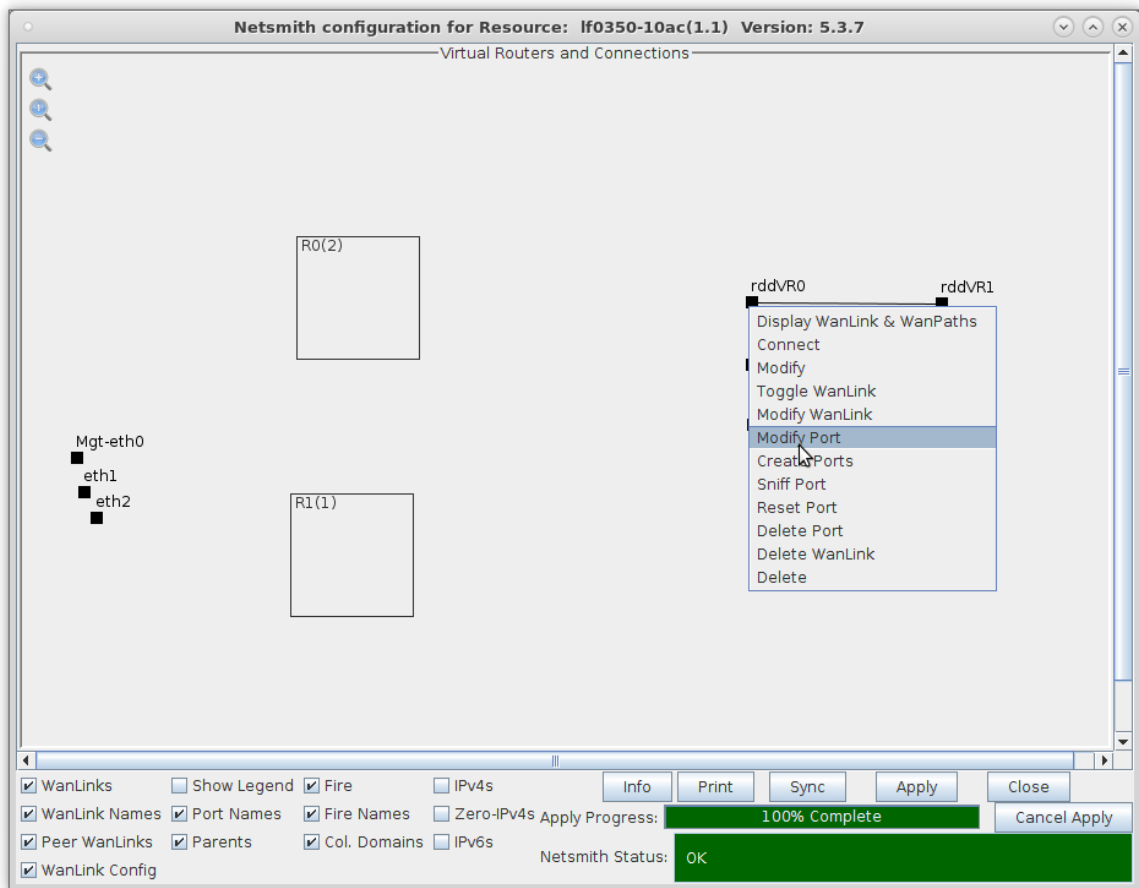


- A. **NOTE:** Modifications in Netsmith are only sent to the LANforge-Server after Applying them
- B. Clicking **Sync** makes sure any changes are synchronized with the current database

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

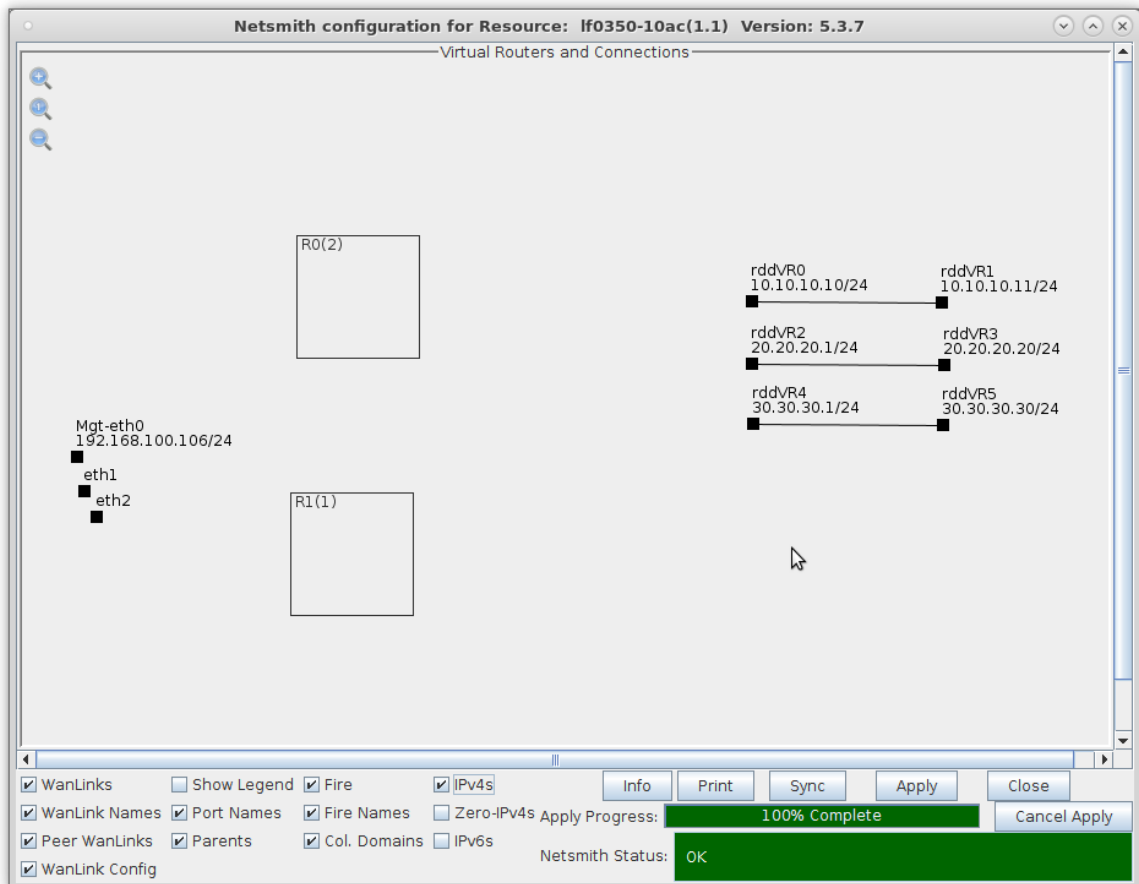
2. Setup the Ports.

A. Right-click the rdd ports and select **Modify Port**



A. Assign each pair of rdd ports a unique subnet and IP address

B. Select the 'IPv4s' checkbox to view the IP addresses of the rdd ports



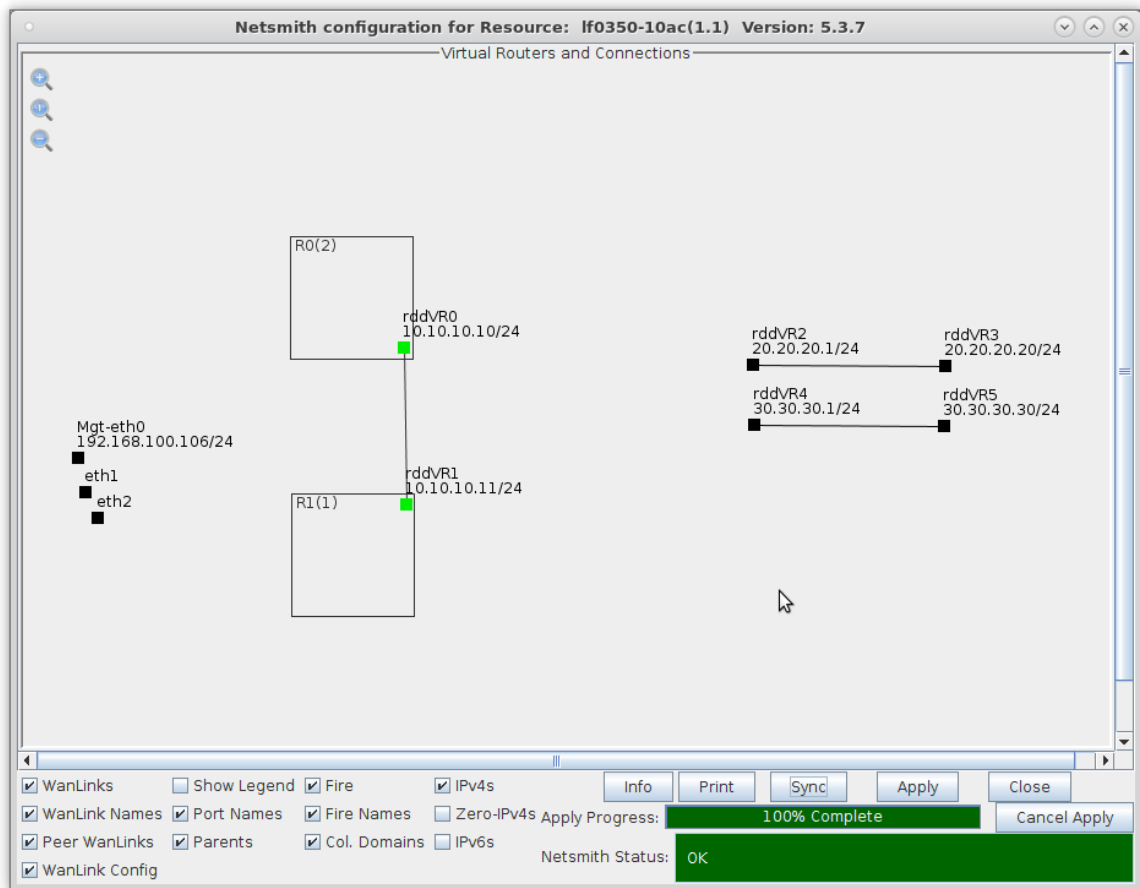
C. Configure rddVR3 and rddVR5 with a Gateway IP that corresponds to their peer rdd interface

The screenshot shows the 'rddVR0 (ct521b-11b4) Configure Settings' window. At the top, it displays 'Port Status Information' with 'Current: LINK-UP TSO GSO' and 'Driver Info: Port Type: Redirect-Device Peer: rddVR1'. Below this is the 'Port Configurables' section, which is divided into 'Standard Configuration' and 'Extended Config' tabs. The 'Standard Configuration' tab is active, showing a list of settings on the left and a 'General Interface Settings' section on the right. The 'General Interface Settings' section includes fields for 'Down', 'Aux-Mgt', 'DHCP Hostname', 'DHCP Vendor ID', 'DHCP Client ID', 'DNS Servers', 'IP Address', 'IP Mask', 'Gateway IP', 'Alias', 'MAC Addr', 'Br Cost', 'Rpt Timer', 'IPSec GW', 'IPSec Local ID', 'Peer IP', 'Global IPv6', 'Link IPv6', 'IPv6 GW', 'MTU', 'TX Q Len', 'Priority', 'WiFi Bridge', 'IPSec Password', and 'IPSec Remote ID'. The 'Port Rates' section on the right includes radio buttons for '10bt-HD', '10bt-FD', '100bt-HD', '100bt-FD', '1000-FD', '2.5G-FD', '5G-FD', '10G-FD', '40G-FD', and 'Autonegotiate'. The 'Advert Rates' section includes checkboxes for '10bt-HD', '10bt-FD', '100bt-HD', '100bt-FD', '1000-FD', '2.5G-FD', '5G-FD', '10G-FD', '40G-FD', and 'Flow-Control'. The 'Offload' section includes checkboxes for 'TSO Enabled', 'UFO Enabled', 'GSO Enabled', 'LRO Enabled', and 'GRO Enabled'. The 'Services' section on the left includes checkboxes for 'Set MAC', 'Set TX Q Len', 'Set MTU', 'Set Offload', 'Set PROMISC', 'Set Rx-All/FCS', 'Set Bridge Info', 'HTTP', 'FTP', 'DNS', 'RADIUS', 'IPSEC-Client', and 'IPSEC-Upstream'. At the bottom of the window are buttons for 'Print', 'Display', 'Probe', 'Sync', 'Apply', 'OK', and 'Cancel'.

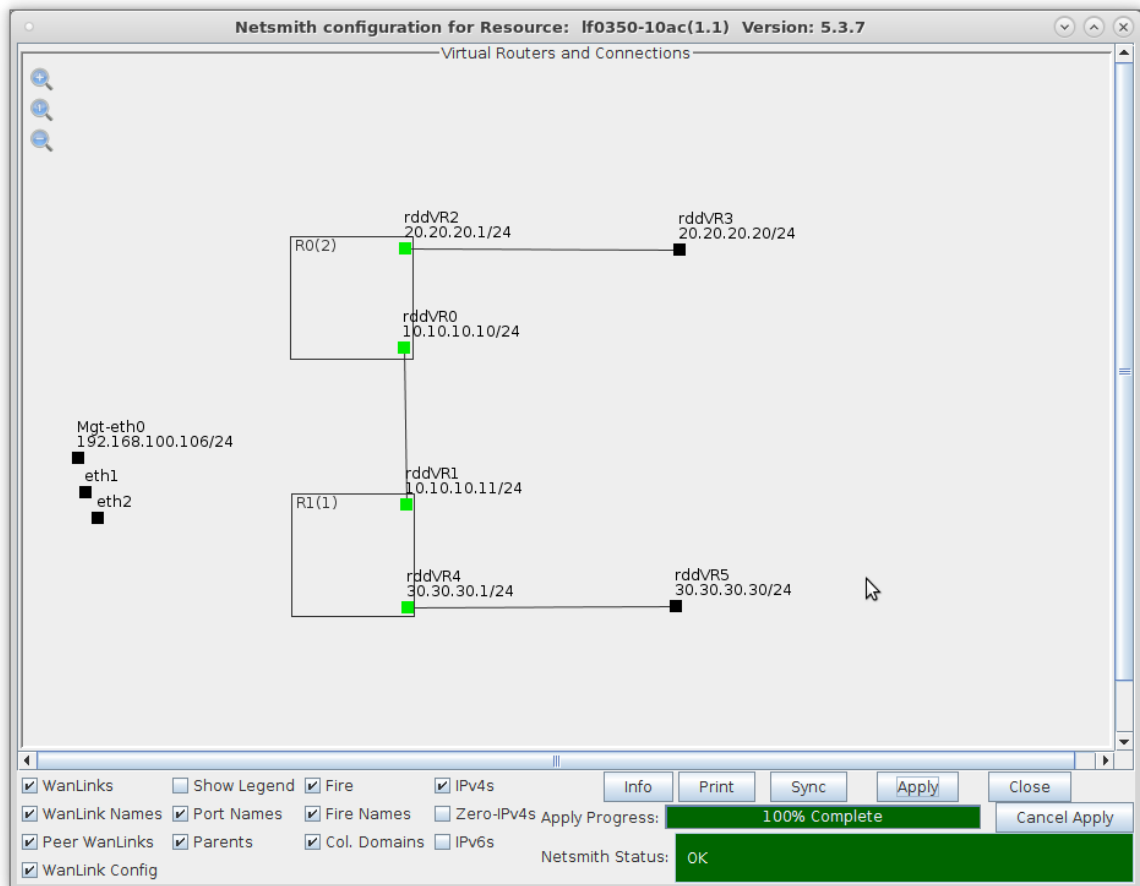
A. **NOTE:** In this example, rddVR3 has a Gateway IP of 20.20.20.1 and rddVR5 has a Gateway IP of 30.30.30.1

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

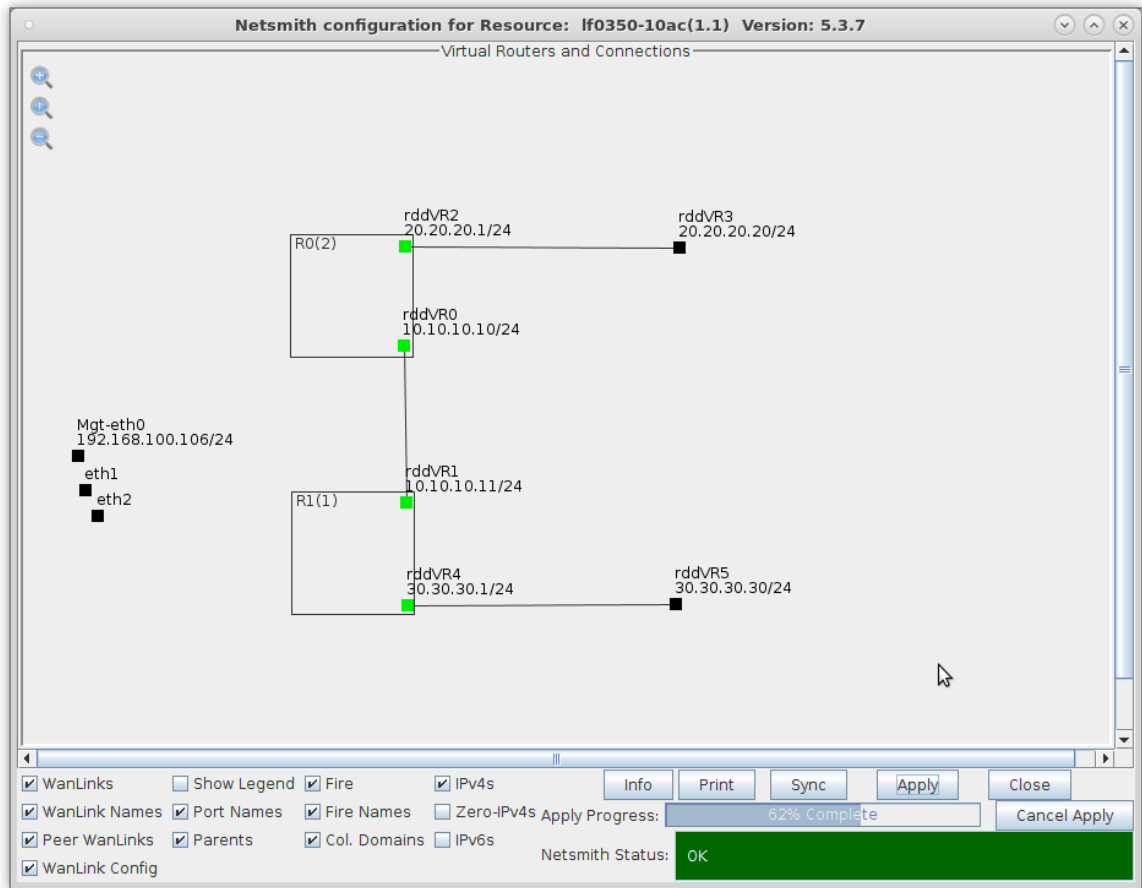
3. Move the Redirected Interfaces into their desired positions.
- A. Drag rddVR0 into Router R0(2) and rddVR1 into Router R1(1)



- B. Drag rddVR2 into Router R0(2) and rddVR4 into Router R1(1)

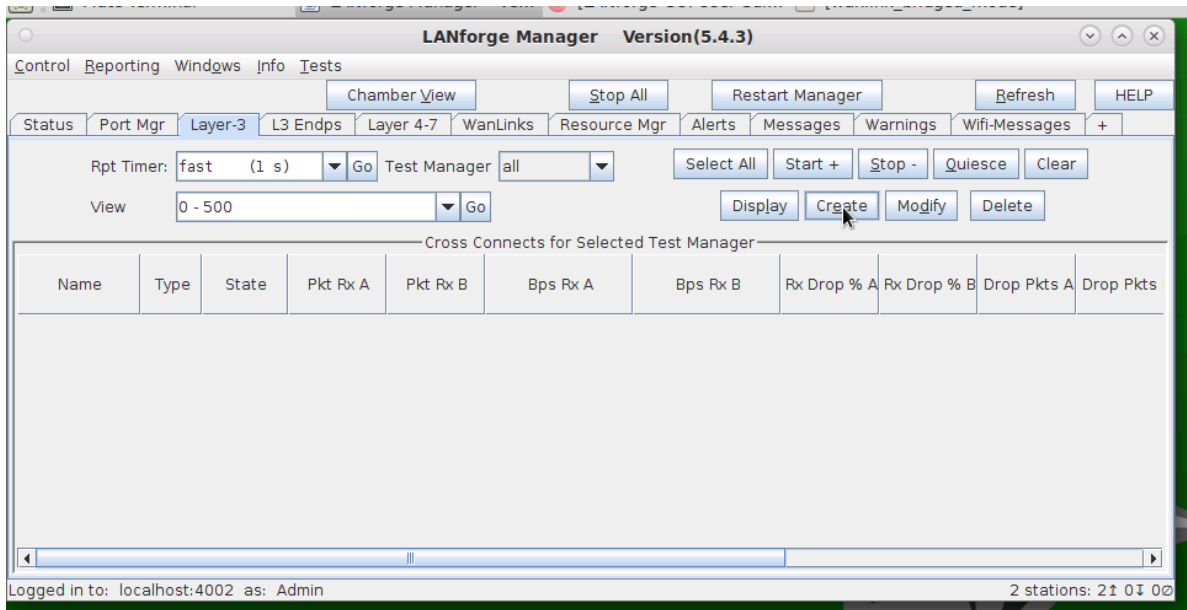


C. Click NetSmith **Apply** to commit the changes



4. Create a TCP connection and sniff traffic without NAT.

A. Go to the **Layer-3** tab and click **Create**





B. Create a Layer-3 TCP connection between endpoints rddVR3 and rddVR5 then click **OK**

**tcp-cx - Create/Modify Cross Connect**

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

**1 Cross-Connect**

CX Name: tcp-cx  
 CX Type: LANforge / TCP

Resource: 1 (ct521b-11b4)

Port: 14 (rddVR3)

Min Tx Rate: Old Modem (9.6 Kbps)

Max Tx Rate: Same

Min PDU Size: Small (300 B)

Max PDU Size: Same

IP ToS: Best Effort (0)

Pkts To Send: Infinite

**2 Cross-Connect**

Report Timer: fast (1 s)

Endpoint A (Client) Endpoint B (Server)

Pid Pattern: increasing (0) increasing (0)

Min IP Port: AUTO AUTO

Max IP Port: Same Same

Min Duration: Forever Forever

Max Duration: Same Same

Min Reconn: 0 (0 ms) 0 (0 ms)

Max Reconn: Same Same

Multi-Conn: Normal (0) Normal (0)

☒ Auto-Helper ☒ Auto-Helper

Script Threshholds

**3 Test Manager**

Cross-Connect: default\_tm

Quiesce: 3 (3 sec)

IP Addr: AUTO AUTO

☐ Replay File ☐ Replay File

☐ Loop ☐ Loop

☐ Dest Mac ☐ Dest Mac

Filename:

Dest MAC:

**4 Cross-Connect**

Endpoint A (Client) Endpoint B (Server)

Snd Buff Size: OS Default OS Default

Rcv Buff Size: OS Default OS Default

Send Bad FCS: zero (0%) zero (0%)

Src MAC: 00:00:00:00:00:00 00:00:00:00:00:00

☐ Use-Proxy ☐ Use-Proxy

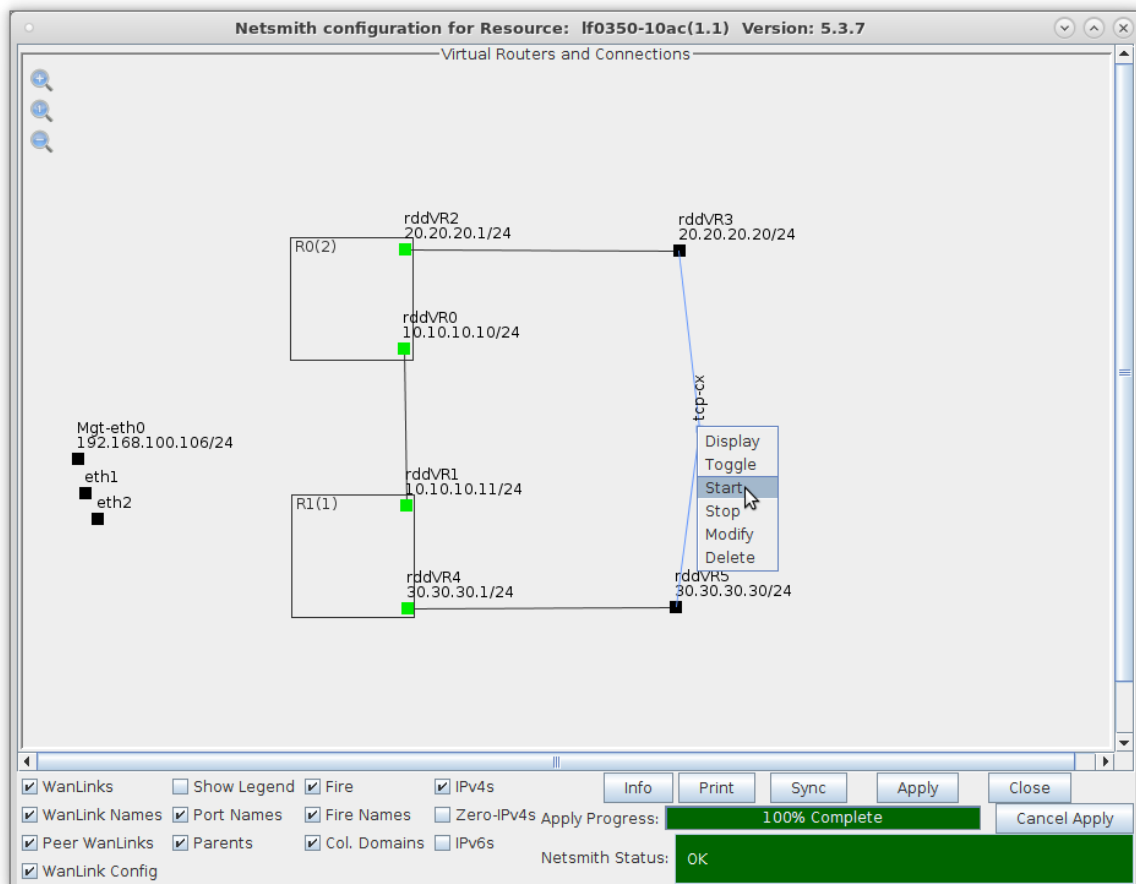
Proxy Addr: 0.0.0.0 0.0.0.0

Proxy Port: 0 0

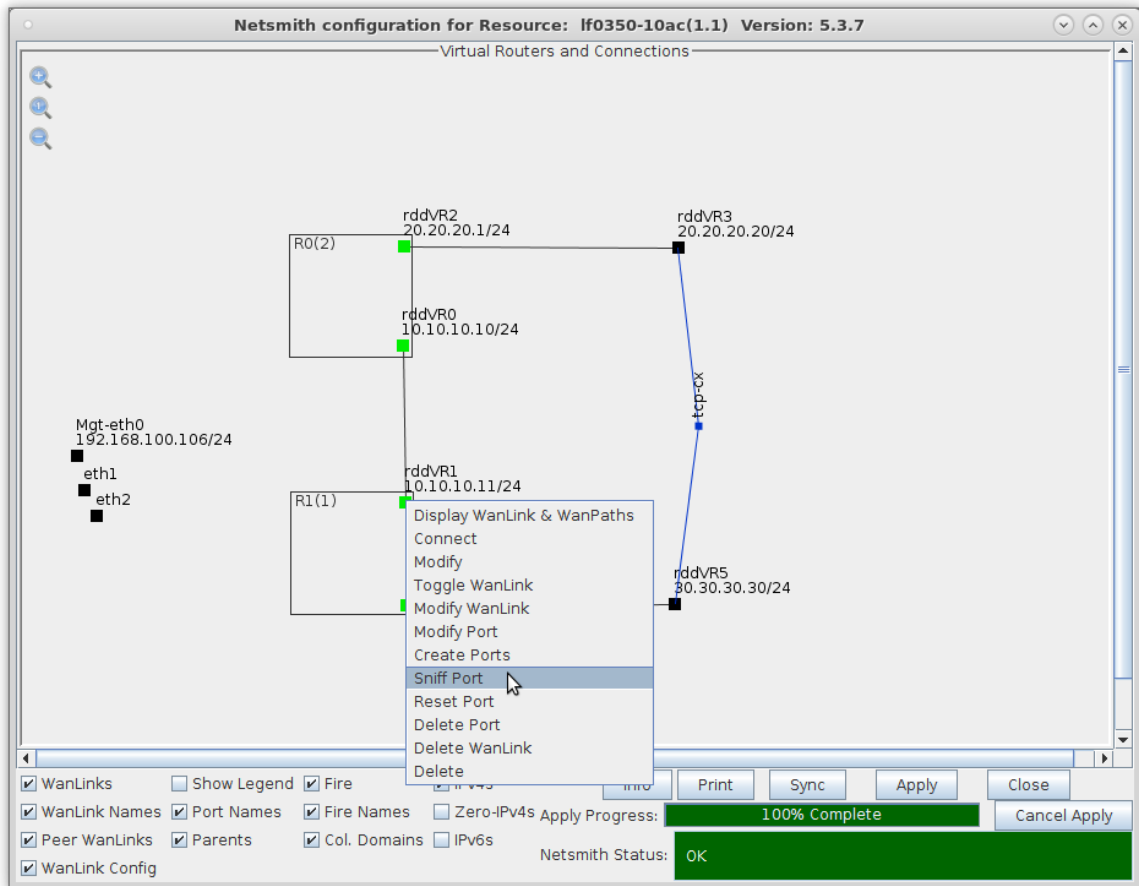
Socket Priority: 0 0

Payload Payload

C. In NetSmith, right-click the TCP connection and click **Start**

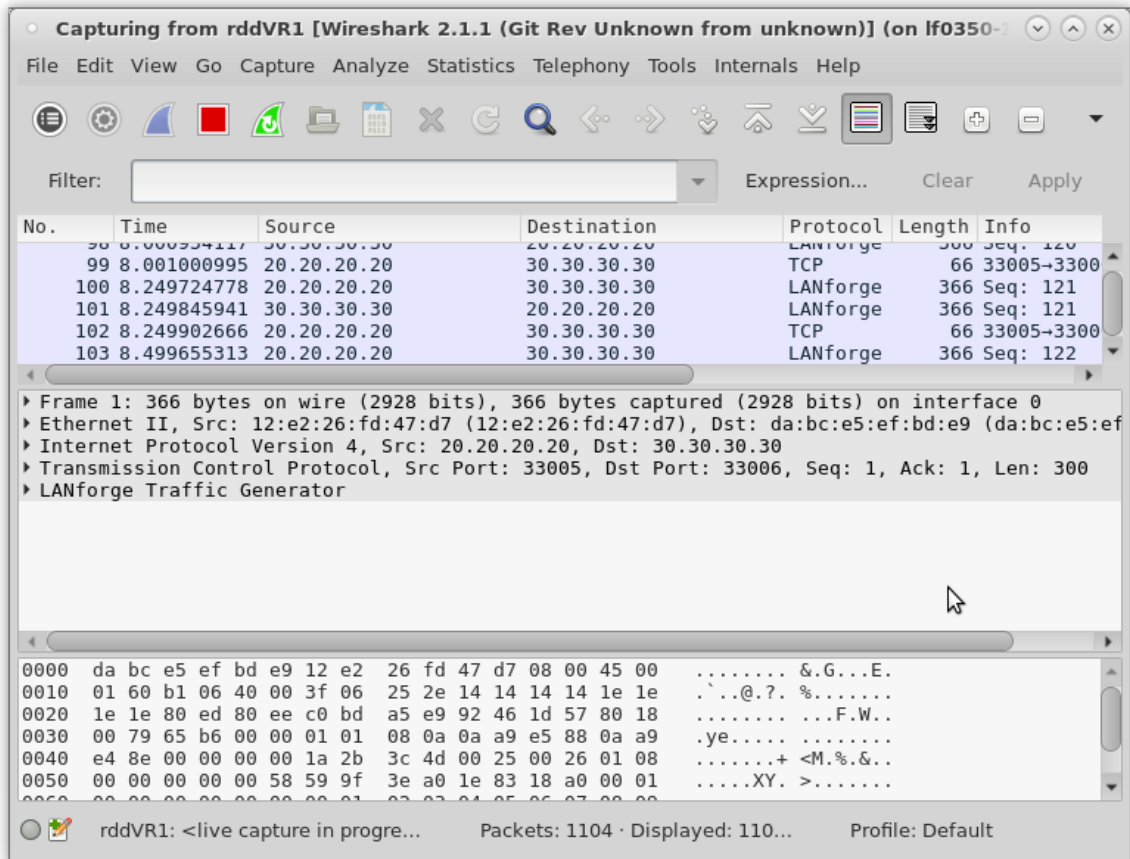


D. Right-click port rddVR1 and click **Sniff Port**



A. **NOTE:** You must have Wireshark properly installed as described here: [Installing Wireshark](#)

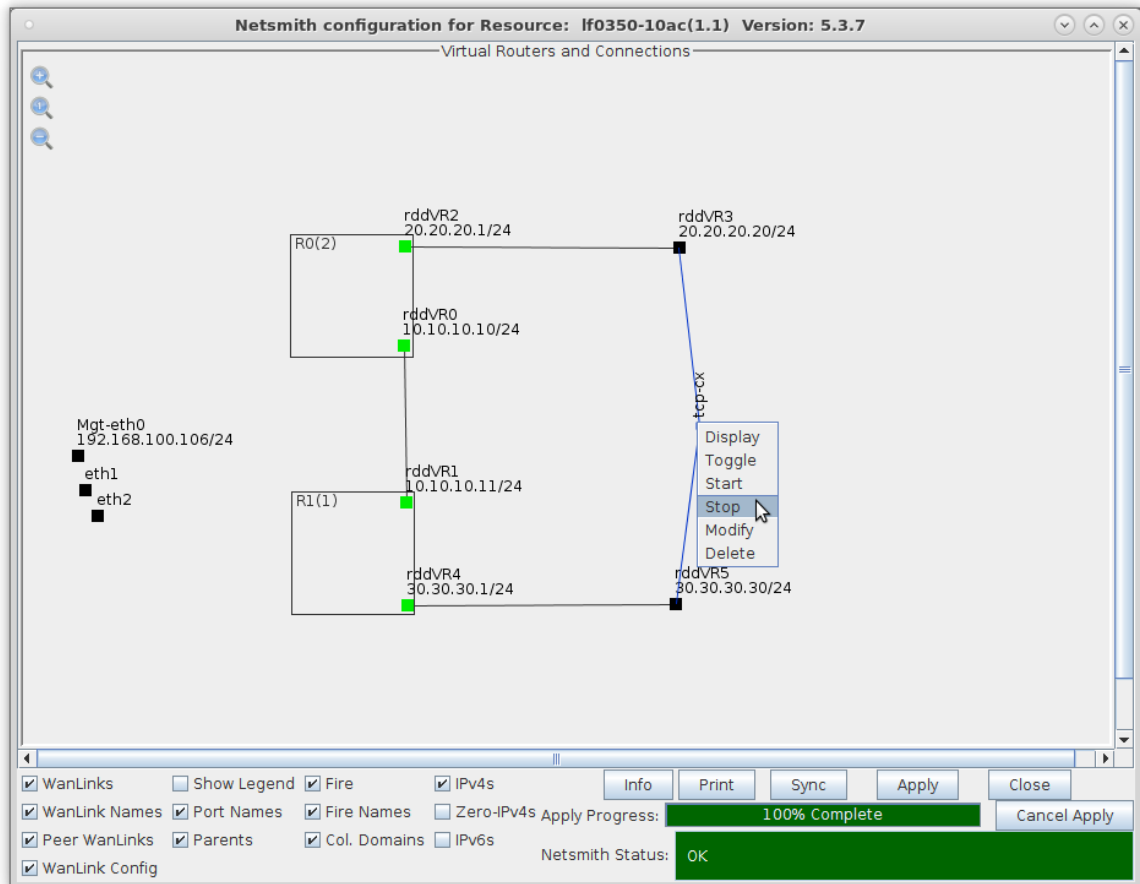
E. After Wireshark begins, notice that the source and destination IP addresses are from 20.20.20.20 (rddVR3) and 30.30.30.30 (rddVR5) as expected without NAT enabled



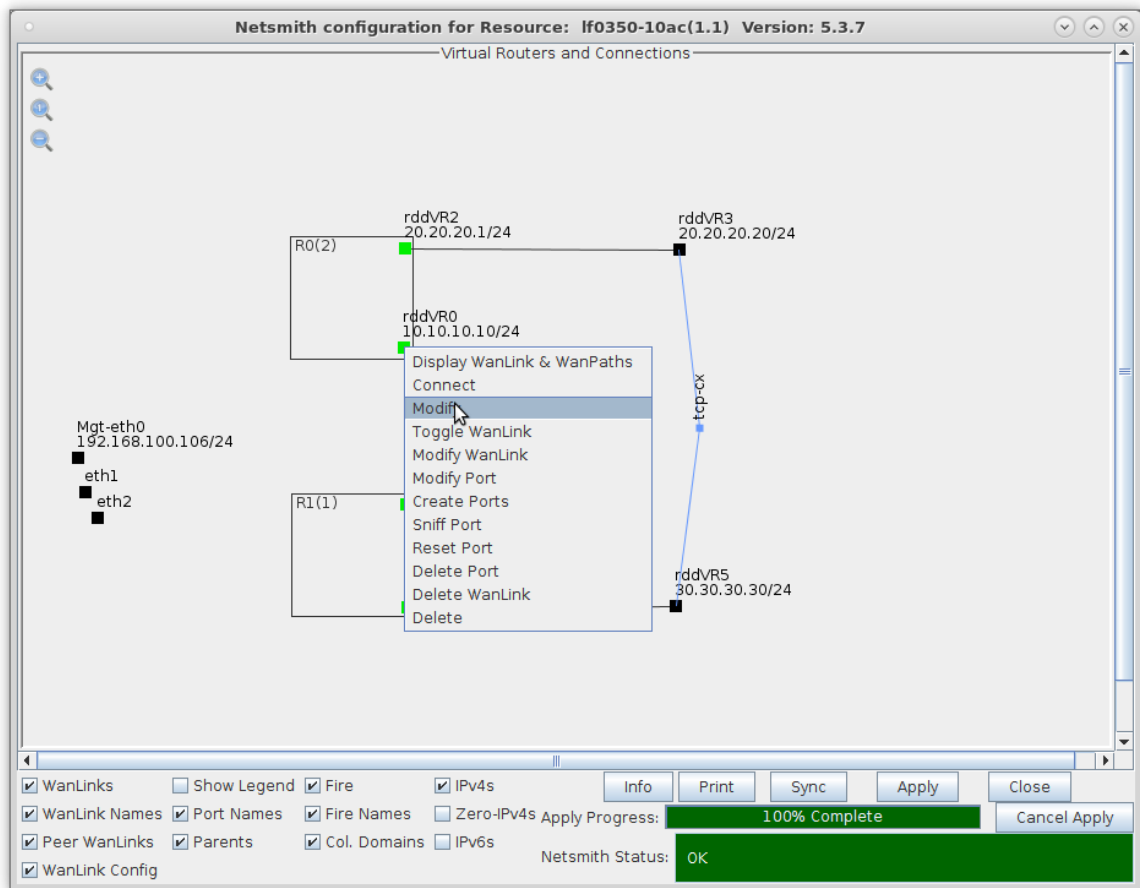
5. Enable NAT and sniff traffic on the same port.

**NOTE** It is important that Endpoint-A of the connection is **behind** the NAT port because it is the side that initiates the connection. Reversing the endpoint ports will cause the connection to fail.

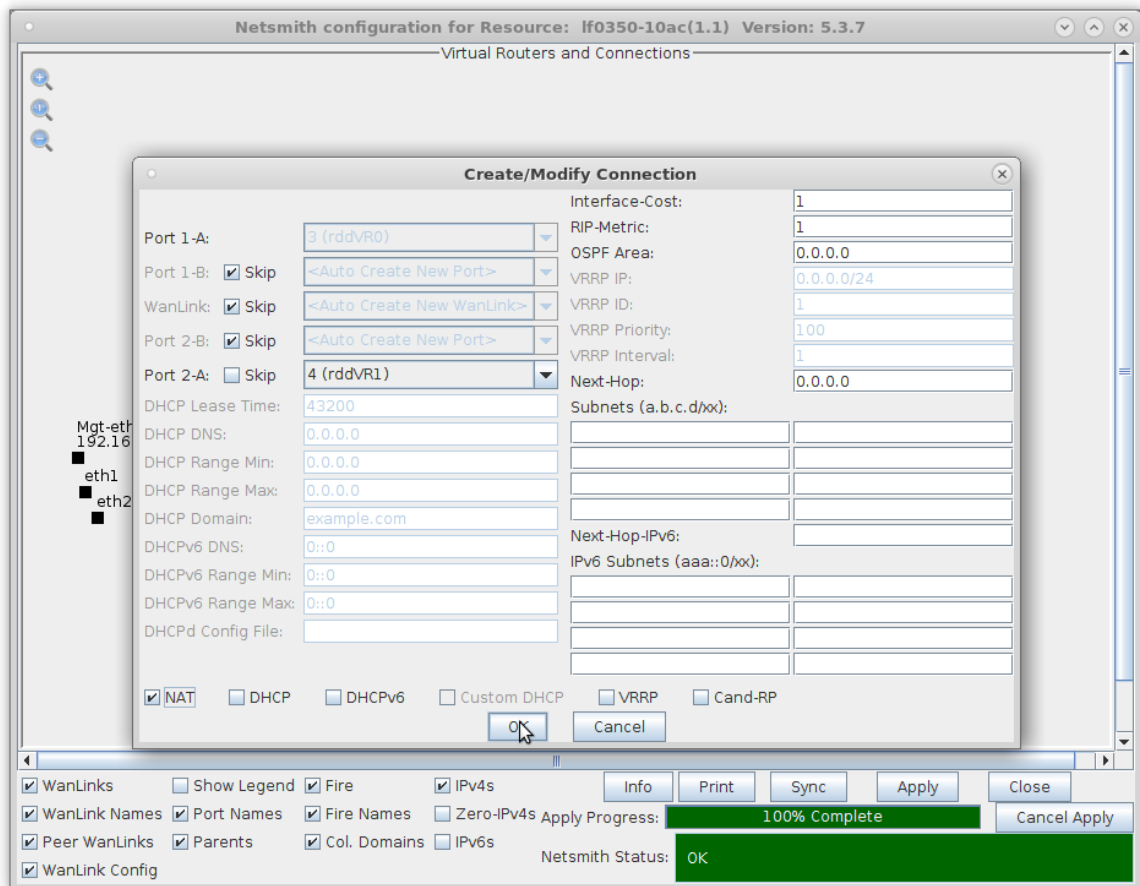
A. Right-click on the TCP connection and select **Stop**



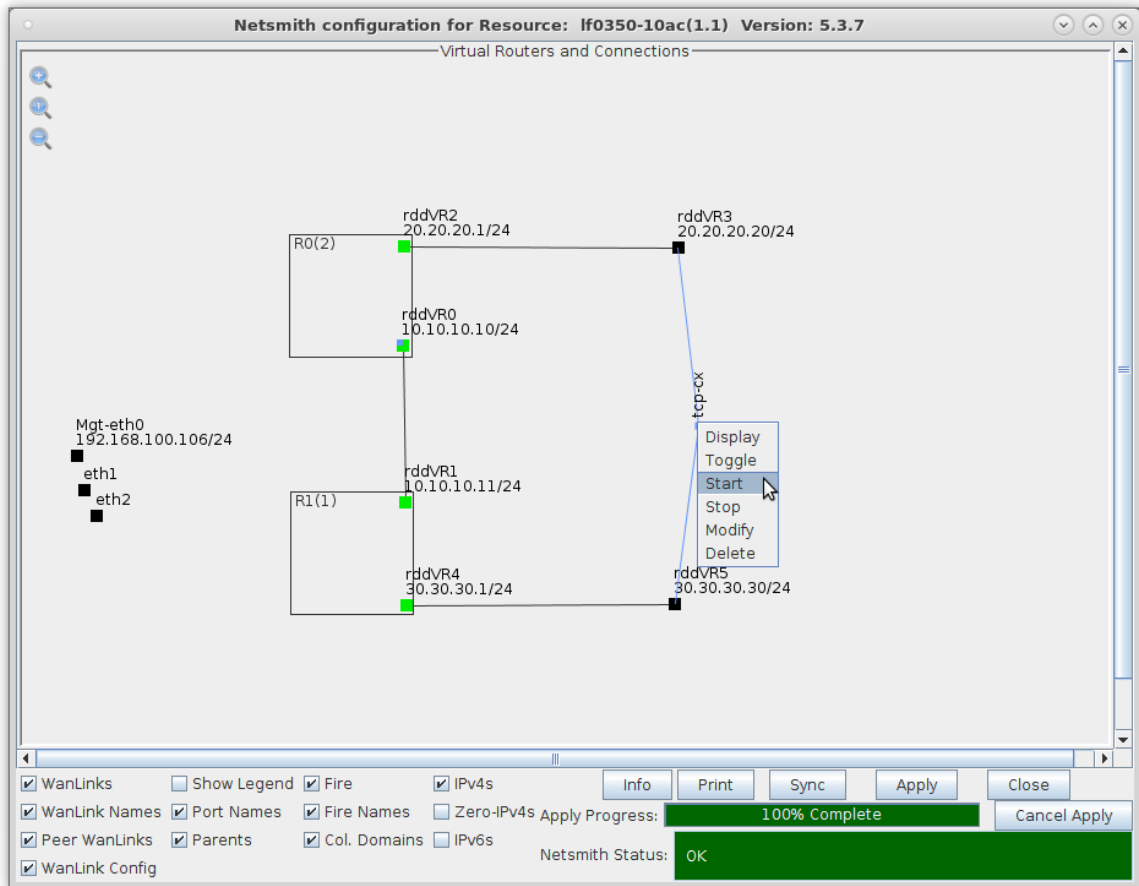
B. Right-click rddvR0 and select **Modify**



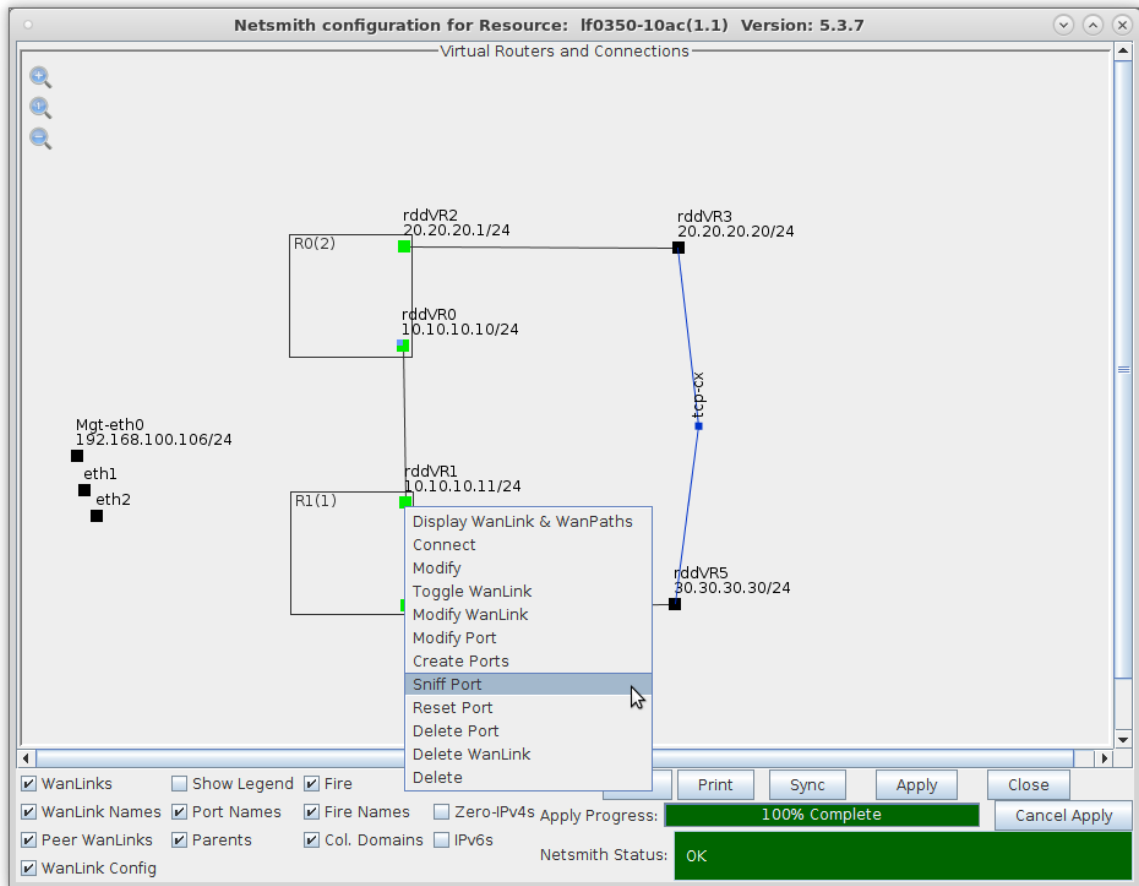
C. Select the 'NAT' checkbox and click **OK**, then click the Netsmith **Apply** button



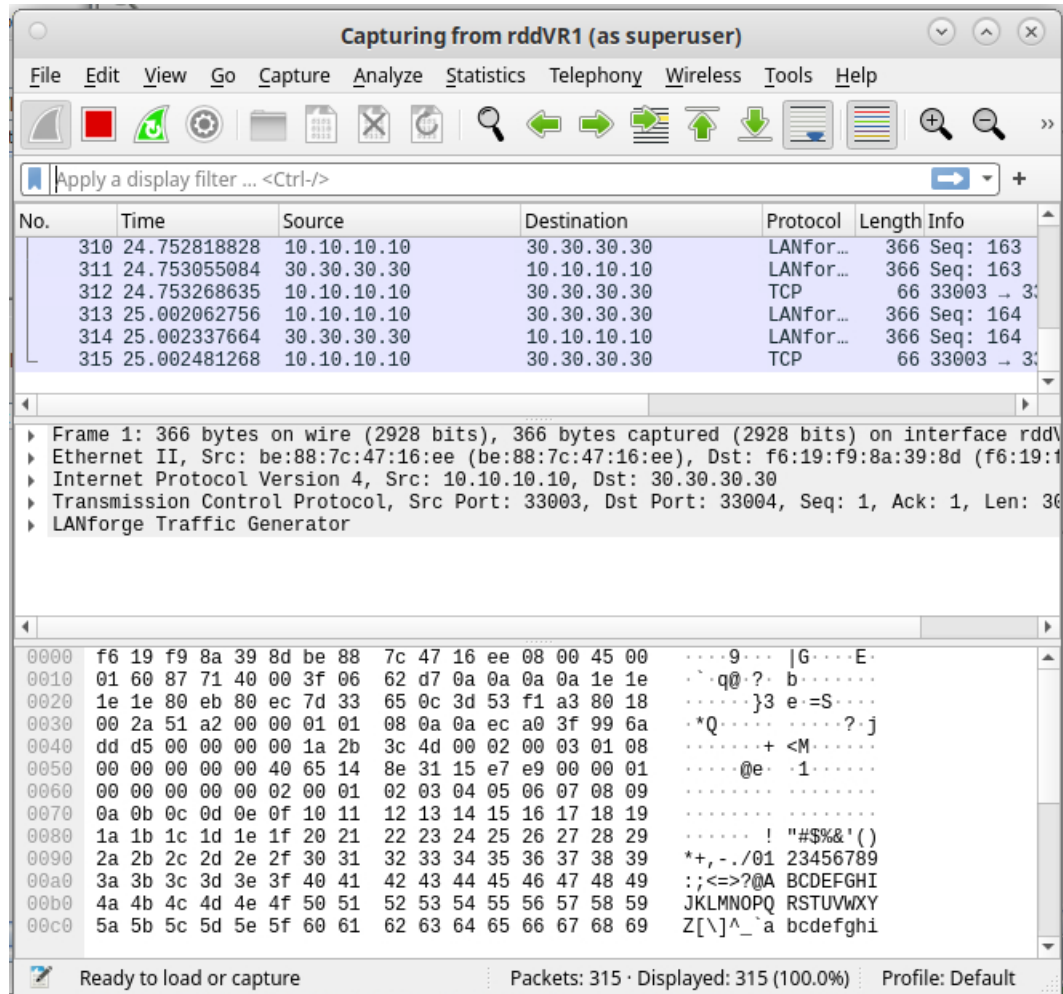
D. Right-click on the TCP connection and select **Start**



E. Right-click port rddvR1 and select **Sniff Port**



- F. After Wireshark begins, notice that any source or destination IP address from or to 20.20.20.20 (rddVR3) has been NAT'd to be 10.10.10.10 because rddVR0 is now performing NAT on all outgoing traffic



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

Candela Technologies, Inc., 2417 Main Street, Suite 201, Ferndale, WA 98248, USA  
[www.candelatech.com](http://www.candelatech.com) | [sales@candelatech.com](mailto:sales@candelatech.com) | +1.360.380.1618