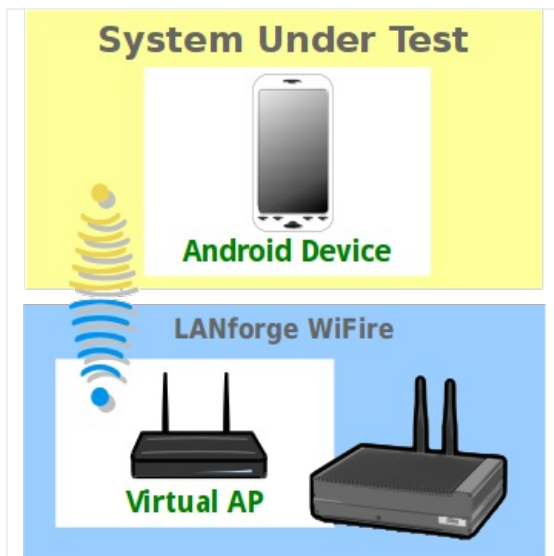
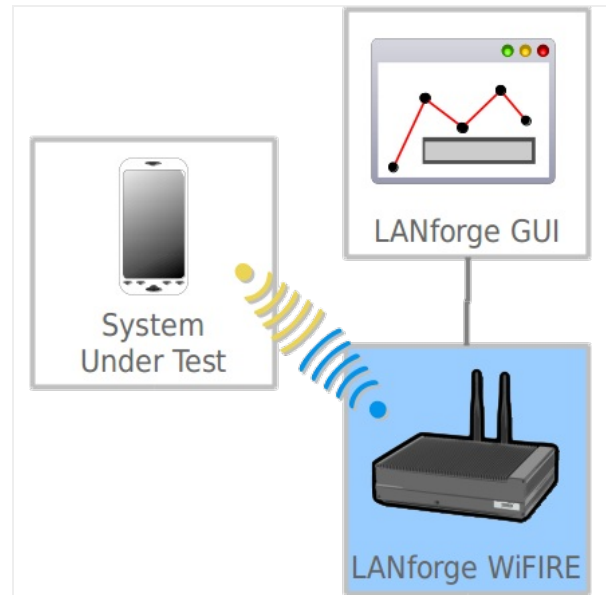


Running UDP Traffic with Android

Goal: Set up Android to be a LANforge resource and then run UDP traffic.

Requires LANforge 5.3.3 or later. Make sure to configure a realm other than 255 for the VAP system, this is because the Android device needs to be in the same realm to be managed. This cookbook will be using realm 195. You can find information on configuring realms using Ifconfig starting from step 4 [here](#).

This cookbook will go through installing and configuring LANforge on an Android device, then setting up a Layer-3 UDP connection between the Android device and another LANforge system. Multiple VAPs will be set up to demonstrate roaming. A bridged VAP setup is used (with the bridge as DHCP server) so the device can retain the same IP during roaming, this prevents the device from having to renew its IP saving some time between rooms.



1. First, we will set up the LANforge system so the Android device can connect.
2. Create the first VAP.

- A. Go to the **Port Mgr** tab.

LANforge Manager Version(5.3.3)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Station Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators File-I/O Layer-4

Disp: 192.168.100.133:0.0 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			192.168.100.195	0	eth0		1,598,411	15,099	6	5,156	15,165,285	14,423	5
1.1.1			0.0.0.0	0	eth1		0	0	0	0	0	0	0
1.1.2			0.0.0.0	0	wiphy0		0	0	0	0	0	0	0
1.1.3			0.0.0.0	0	wiphy1		0	0	0	0	0	0	0
1.1.4			0.0.0.0	0	wiphy2		0	0	0	0	0	0	0
1.1.5		☒	0.0.0.0	0	wlan0	wiphy0	0	0	0	0	0	0	0
1.1.6		☒	0.0.0.0	0	wlan2	wiphy2	0	0	0	0	0	0	0
1.1.7		☒	0.0.0.0	0	wlan1	wiphy1	0	0	0	0	0	0	0

Logged in to: brent-523:4002 as: Admin

- B. Select wiphy0 and click **Create**.

LANforge Manager Version(5.3.3)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Station Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators File-I/O Layer-4

Disp: 192.168.100.133:0.0 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			192.168.100.195	0	eth0		1,749,802	16,570	6	5,222	16,682,051	15,831	6
1.1.1			0.0.0.0	0	eth1		0	0	0	0	0	0	0
1.1.2			0.0.0.0	0	wiphy0		0	0	0	0	0	0	0
1.1.3			0.0.0.0	0	wiphy1		0	0	0	0	0	0	0
1.1.4			0.0.0.0	0	wiphy2		0	0	0	0	0	0	0
1.1.5		☒	0.0.0.0	0	wlan0	wiphy0	0	0	0	0	0	0	0
1.1.6		☒	0.0.0.0	0	wlan2	wiphy2	0	0	0	0	0	0	0
1.1.7		☒	0.0.0.0	0	wlan1	wiphy1	0	0	0	0	0	0	0

Logged in to: brent-523:4002 as: Admin

- C. Select **WiFi VAP** and enter in the below values.

Create VLANs on Port: 1.1.2

1 ☐ MAC-VLAN ☐ 802.1Q-VLAN ☐ Redirect ☐ Bridge ☐ GRE Tunnel

☐ WiFi STA ☒ WiFi VAP ☐ WiFi Monitor ☐ WiFi Virtual Radio

2 Shelf: 1 Resource: 1 (brent-523) Port: 2 (wiphy0)

3 VLAN ID: ☐ DHCP-IPv4

Parent MAC: 00:0e:8e:4e:59:2f DHCP Client ID: None

MAC Addr: xx:xx:xx:*:xx IP Address: Global IPv6: AUTO

Quantity: 1 IP Mask or Bits: Link IPv6: AUTO

Gateway IP: IPv6 GW: AUTO

#1 Redir Name: #2 Redir Name:

STA ID: 0 SSID: android-test

WiFi AP: Key/Phrase:

☐ WPA ☐ WPA2 ☐ WEP

4 ☐ Down

Apply Cancel

- A. Quantity 1
- B. STA ID: 0
- C. SSID: android-test

D. Click **Apply**.

A. **Note:** we will keep this window open for creating the second VAP.

3. Create the second VAP.

Create VLANs on Port: 1.1.2

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

2 Shelf: 1 Resource: 1 (brent-523) Port: 3 (wiphy1)

3 VLAN ID: ☐ DHCP-IPv4
Parent MAC: 04:f0:21:11:e7:36 DHCP Client ID: None
MAC Addr: xx:xx:xx:*:*:xx IP Address: Global IPv6: AUTO
Quantity: 1 IP Mask or Bits: Link IPv6: AUTO
Gateway IP: IPv6 GW: AUTO
#1 Redir Name: #2 Redir Name:
STA ID: 1 SSID: android-test2
WiFi AP: Key/Phrase:
☐ WPA ☐ WPA2 ☐ WEP

4 ☐ Down
Apply **Cancel**

A. Select **wiphy1** from the port drop-down menu.

B. Update the **STA ID** and **SSID** with the below values.

A. STA ID: 1

B. SSID: android-test2

C. Click **Apply** and close the Create Port window.

4. Set up a bridge for both VAPs.

A. Go to the **Status** tab, and click the **Netsmith** button for the AP system (Resource 1 in this example).

LANforge Manager Version(5.3.3)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Station Mgr Messages
Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators File-I/O Layer-4

License Info
Licenses expire in: 118 days.
Support expires in: 118 days.

Current Users
* Admin from:192.168.100.133
gnuserver from:127.0.0.1

Test Configuration Database
List: BLANK Load
Name: Delete
Load Behavior: Choose One Save
Download DB Show Progress

Virtual Shelf 1
Resource 1
Netsmith

Logged in to: brent-523:4002 as: Admin

- B. Right-click in the NetSmith window and select **New Router**.

A. Click **OK** to accept the default values.

B. Click **Apply** in NetSmith.

- C. Right-click in the NetSmith window and select **New Bridge**. Then set the below values.

A. Quantity: 1

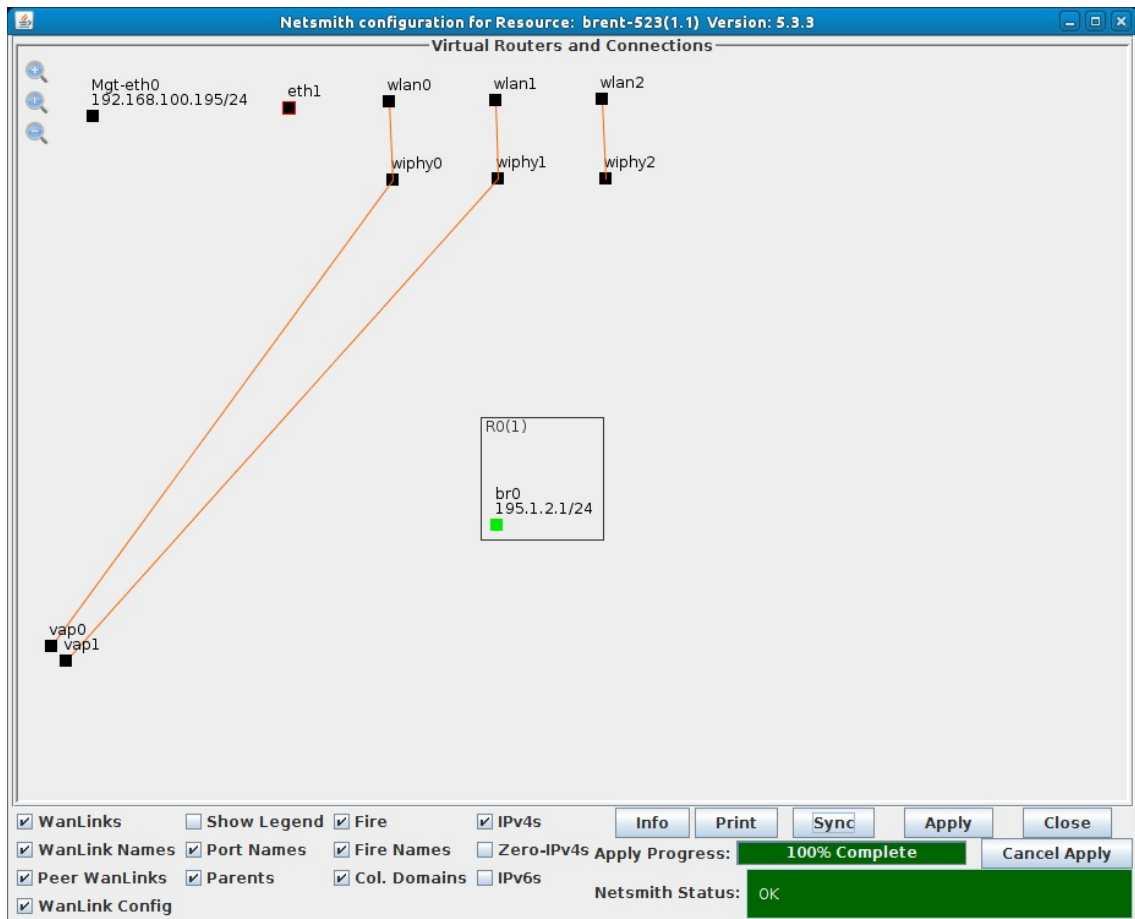
B. Bridge Name: br0

C. IP Address: 195.1.2.1/24

- D. Click **Apply** and close the Create Port window.

- E. Click **Sync** in NetSmith and the br0 interface should appear.

F. Drag the br0 interface into the virtual router. The interface box should change from black to green.



G. Right click br0 and select modify.

The screenshot shows the 'Create/Modify Connection' dialog box. The title bar reads 'Create/Modify Connection'. The dialog is divided into two main sections. The left section contains fields for 'Port 1-A' (10 (br0)), 'Port 1-B' (Skip), 'WanLink' (Skip), 'Port 2-B' (Skip), 'Port 2-A' (Skip), 'DHCP Lease Time' (300), 'DHCP DNS' (195.1.2.1), 'DHCP Range Min' (195.1.2.10), 'DHCP Range Max' (195.1.2.20), 'DHCP Domain', 'DHCPv6 DNS', 'DHCPv6 Range Min', 'DHCPv6 Range Max', and 'DHCPd Config File'. The right section contains fields for 'Interface-Cost' (1), 'RIP-Metric' (1), 'OSPF Area' (0.0.0.0), 'VRRP IP' (0.0.0.0/24), 'VRRP ID' (1), 'VRRP Priority' (100), 'VRRP Interval' (1), 'Next-Hop' (0.0.0.0), 'Subnets (a.b.c.d/xx)', 'Next-Hop-IPv6', and 'IPv6 Subnets (aaa::0/xx)'. At the bottom, there are checkboxes for 'NAT', 'DHCP' (checked), 'DHCPv6', 'Custom DHCP', 'VRRP', and 'Cand-RP'. 'OK' and 'Cancel' buttons are at the bottom center.

H. Select **DHCP** and use the below values.

- A. DHCP Lease Time: 300
- B. DHCP DNS: 195.1.2.1
- C. DHCP Range Min: 195.1.2.10
- D. DHCP Range Max: 195.1.2.20

I. Click **OK**.

J. Right click br0 and select **Modify Port**.

Port Status Information
 Current: LINK-DOWN PROBE-ERROR TSO UFO GSO GRO
 Driver Info: Port Type: Bridge Driver: bridge(2.3) Bus: N/A

Port Configurables

Enable

- ☐ Set IF Down
- ☐ Set MAC
- ☐ Set TX Q Len
- ☐ Set MTU
- ☐ Set Offload
- ☐ Set Bridge Info

General Interface Settings

- ☐ Down
- ☐ Aux-Mgt
- ☐ DHCP-IPv6
- ☒ DHCP Release
- ☐ DHCP-IPv4
- ☐ Secondary-IPs
- DNS Servers: BLANK
- IP Address: 195.1.2.1
- IP Mask: 255.255.255.0
- Gateway IP: 0.0.0.0
- Alias:
- MAC Addr: 00:00:00:00:00:00
- Rpt Timer: medium (8 s)
- DHCP Vendor ID: None
- DHCP Client ID: None
- Peer IP: NA
- Global IPv6: AUTO
- Link IPv6: AUTO
- IPv6 GW: AUTO
- MTU: 1500
- TX Q Len: 0
- WiFi Bridge: NONE

Spanning-Tree

- ☐ Spanning-Tree
- Aging Time: 300
- Bridge Priority: 32768
- Max Age: 20
- Hello Time: 2
- Forwarding Delay: 15

Services

- ☐ HTTP
- ☐ FTP
- ☐ RADIUS

Bridge Information

Configured Ports | Current Ports

Remove Ports

Add Ports

vap0
vap1

Print View Details Probe Sync Apply OK Cancel

- Enter **vap0** and **vap1** into the text box as shown above.
- Click **Add Ports**.
- Click **Apply** then **Sync**. The Current Ports column should now show **vap0** and **vap1**.

Configured Ports	Current Ports
vap0	vap0
vap1	vap1

- Click **OK** to close the window.

K. Click **Apply** in Netsmith.

5. Create a redirect-device inside the virtual router. The Android will connect to this port for management purposes.

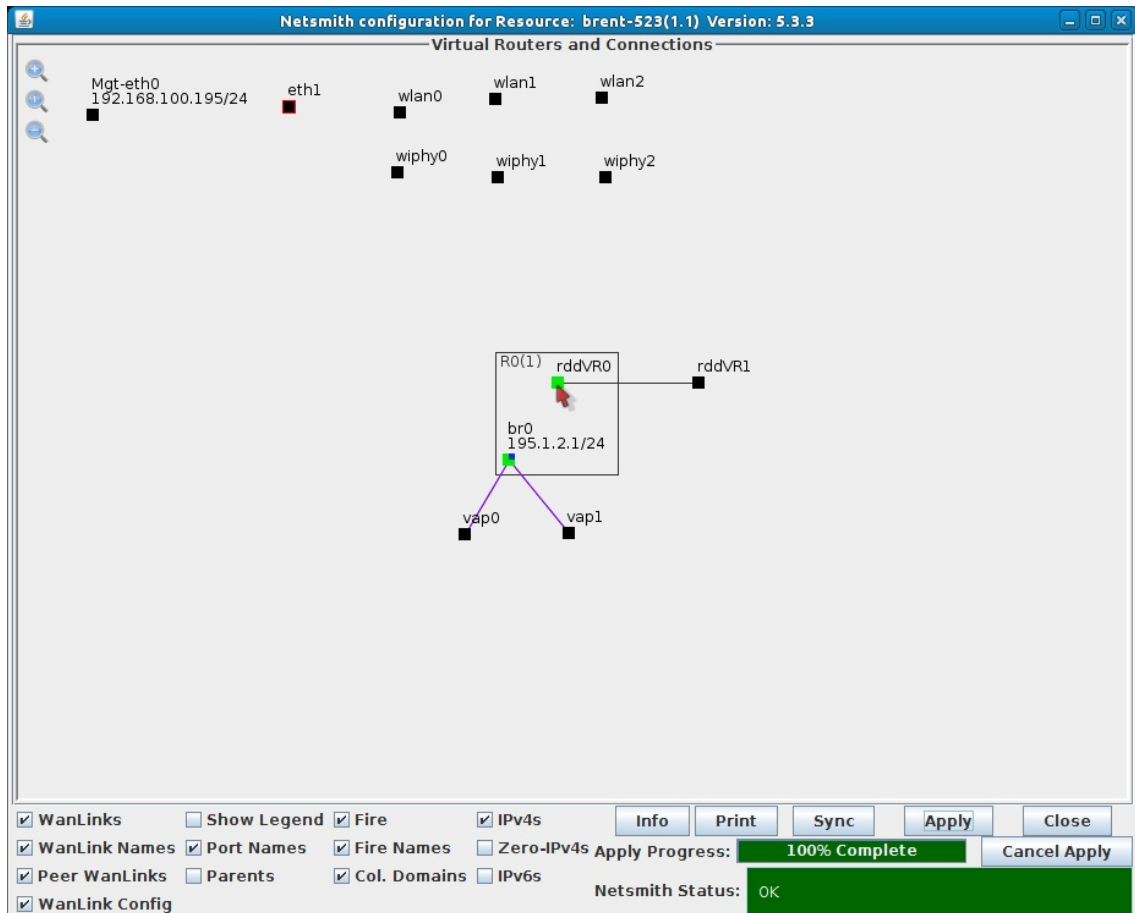
- A. Right-click in the NetSmith window and select **New Connection**.

A. Select the **Skip** checkbox for Port 1-B, WanLink, and Port 2-B.

B. Click **OK**

- B. Click **Apply** in NetSmith.

- C. Drag one of the rdd interfaces into the virtual router (rddVR0 is used in this example). The interface box should change to green.



A. **Note:** The other rdd (rddVR1 in this case) will not be used and can be ignored.

- D. Click **Apply** in NetSmith.

E. Right click rddVR0 and select **Modify Port**.

rddVR0 (brent-523) Configure Settings

Port Status Information
Current: LINK-UP PROBE-ERROR TSO UFO GSO GRO
Driver Info: Port Type: Redirect-Device Peer: rddVR1

Port Configurables

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: 195.1.1.1/24 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: a6:b5:cc:73:01:e3 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

Services

☐ HTTP
☐ FTP
☐ RADIUS

Offload

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

Print View Details Probe Sync Apply OK Cancel

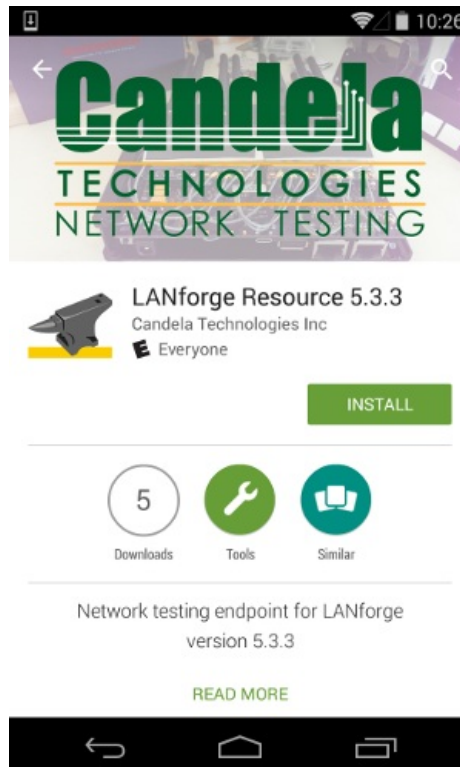
A. Set the **IP Address** to 195.1.1.1/24

B. Click **OK**.

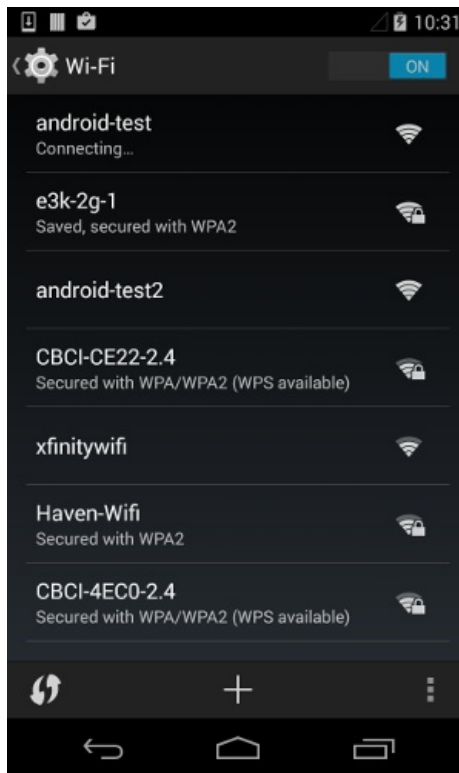
F. Close NetSmith.

6. Set up the Android device.

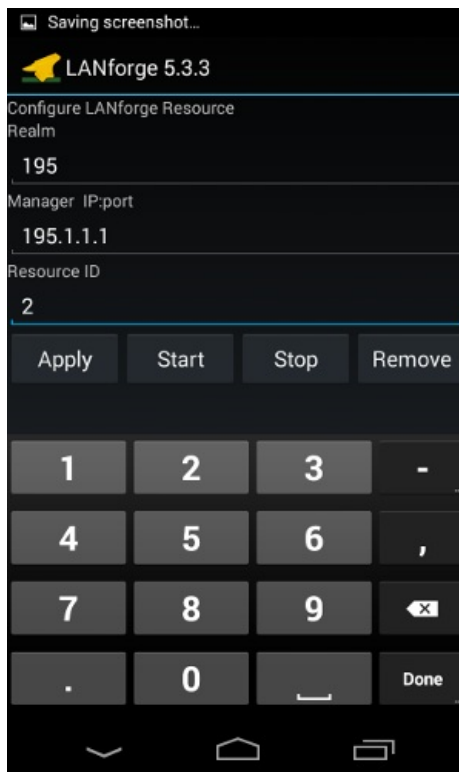
A. Install LANforge Resource from the Google Play Store.



B. Once installed, connect your device to **android-test** using Android's WiFi setup.



C. Launch the LANforge Resource app and set the values below.

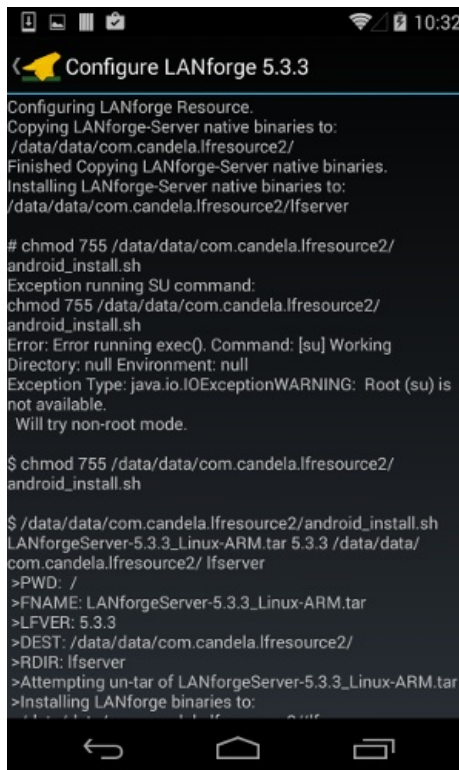


A. Realm 195

B. Manager IP:port: 195.1.1.1

C. Resource ID: 2

- D. Push the **Apply** button to apply changes and start LANforge. After 20-30 seconds the LANforge system should see the Android device connect.



```
Configure LANforge 5.3.3

Configuring LANforge Resource.
Copying LANforge-Server native binaries to:
/data/data/com.candela.lfresource2/
Finished Copying LANforge-Server native binaries.
Installing LANforge-Server native binaries to:
/data/data/com.candela.lfresource2/lfserver

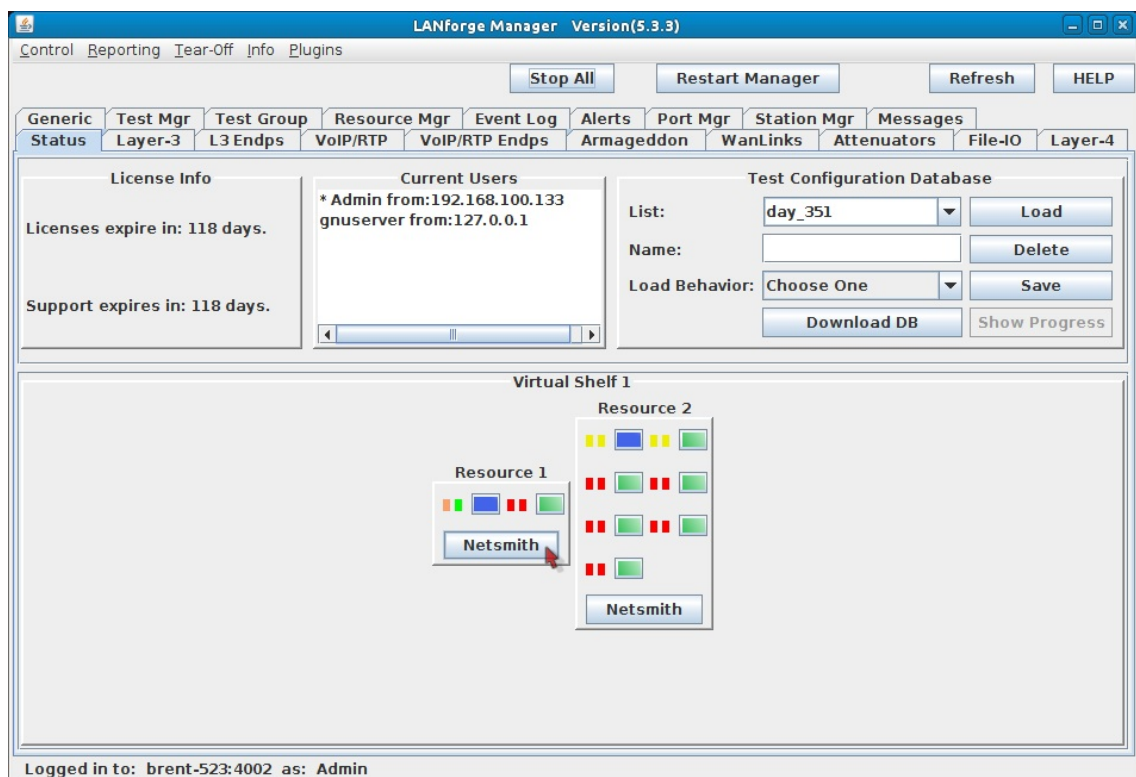
# chmod 755 /data/data/com.candela.lfresource2/
android_install.sh
Exception running SU command:
chmod 755 /data/data/com.candela.lfresource2/
android_install.sh
Error: Error running exec(). Command: [su] Working
Directory: null Environment: null
Exception Type: java.io.IOExceptionWARNING: Root (su) is
not available.
Will try non-root mode.

$ chmod 755 /data/data/com.candela.lfresource2/
android_install.sh

$ /data/data/com.candela.lfresource2/android_install.sh
LANforgeServer-5.3.3_Linux-ARM.tar 5.3.3 /data/data/
com.candela.lfresource2/ lfserver
>PWD: /
>FNAME: LANforgeServer-5.3.3_Linux-ARM.tar
>LFVER: 5.3.3
>DEST: /data/data/com.candela.lfresource2/
>RDIR: lfserver
>Attempting un-tar of LANforgeServer-5.3.3_Linux-ARM.tar
>Installing LANforge binaries to:
```

7. Create and run a Layer-3 UDP connection.

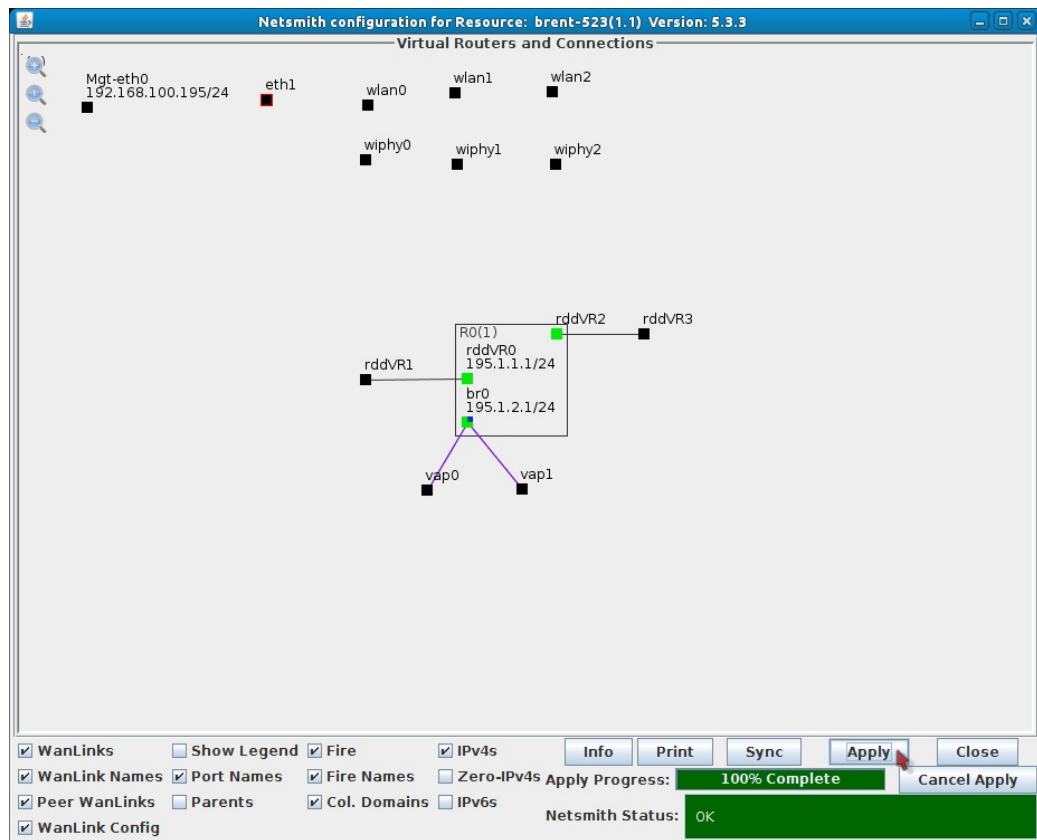
- A. Go to the **Status** tab, and click the **Netsmith** button for the AP system (Resource 1 in this example).



- B. Create a redirect-device inside the virtual router.

- A. Right-click in the NetSmith window and select **New Connection**.

- B. Select the **Skip** checkbox for Port 1-B, WanLink, and Port 2-B.
- C. Click **OK**.
- D. Click **Apply** in NetSmith.
- E. Drag rddVR2 into the virtual router. The interface box should change to green.



- F. Click **Apply** in NetSmith.

G. Right click rddVR2 and select **Modify Port**.

The screenshot shows the 'rddVR2 (brent-523) Configure Settings' window. At the top, it displays 'Port Status Information' with 'Current: LINK-UP PROBE-ERROR TSO UFO GSO GRO' and 'Driver Info: Port Type: Redirect-Device Peer: rddVR3'. Below this is the 'Port Configurables' section. On the left, there are checkboxes for 'Enable' (Set IF Down, Set MAC, Set TX Q Len, Set MTU, Set Offload, Set PROMISC, Set Rx-All/FCS, Set Bridge Info) and 'Services' (HTTP, FTP, RADIUS). The main area is 'General Interface Settings', which includes fields for 'Down', 'Aux-Mgt', 'DHCP-IPv4', 'Secondary-IPs', 'DHCP Vendor ID', 'DHCP Client ID', 'DNS Servers', 'Peer IP', 'IP Address' (195.1.3.1/24), 'Global IPv6', 'IP Mask' (0.0.0.0), 'Link IPv6', 'Gateway IP' (0.0.0.0), 'IPv6 GW', 'Alias', 'MTU' (1500), 'MAC Addr' (2e:e8:dd:7a:00:a9), 'TX Q Len' (1000), 'Br Cost' (Ignore), 'Priority' (Ignore), 'Rpt Timer' (medium (8 s)), and 'WiFi Bridge' (NONE). On the right, there are 'Port Rates' (10bt-HD, 10bt-FD, 100bt-HD, 100bt-FD, 1000-FD, 10G-FD, 40G-FD, Autonegotiate) and 'Advert Rates' (10bt-HD, 10bt-FD, 100bt-HD, 100bt-FD, 1000-FD, 10G-FD, 40G-FD, Flow-Control). At the bottom, there are buttons for 'Print', 'View Details', 'Probe', 'Sync', 'Apply', 'OK', and 'Cancel'.

I. Set the **IP Address** to 195.1.3.1/24

II. Click **OK**.

H. Right click rddVR3 and select **Modify Port**

The screenshot shows the 'rddVR3 (brent-523) Configure Settings' window. At the top, it displays 'Port Status Information' with 'Current: LINK-UP PROBE-ERROR TSO UFO GSO GRO' and 'Driver Info: Port Type: Redirect-Device Peer: rddVR2'. Below this is the 'Port Configurables' section. On the left, there are checkboxes for 'Enable' (Set IF Down, Set MAC, Set TX Q Len, Set MTU, Set Offload, Set PROMISC, Set Rx-All/FCS, Set Bridge Info) and 'Services' (HTTP, FTP, RADIUS). The main area is 'General Interface Settings', which includes fields for 'Down', 'Aux-Mgt', 'DHCP-IPv4', 'Secondary-IPs', 'DHCP Vendor ID', 'DHCP Client ID', 'DNS Servers', 'Peer IP', 'IP Address' (195.1.3.2/24), 'Global IPv6', 'IP Mask' (0.0.0.0), 'Link IPv6', 'Gateway IP' (195.1.3.1), 'IPv6 GW', 'Alias', 'MTU' (1500), 'MAC Addr' (02:85:d7:b0:4f:50), 'TX Q Len' (1000), 'Br Cost' (Ignore), 'Priority' (Ignore), 'Rpt Timer' (medium (8 s)), and 'WiFi Bridge' (NONE). On the right, there are 'Port Rates' (10bt-HD, 10bt-FD, 100bt-HD, 100bt-FD, 1000-FD, 10G-FD, 40G-FD, Autonegotiate) and 'Advert Rates' (10bt-HD, 10bt-FD, 100bt-HD, 100bt-FD, 1000-FD, 10G-FD, 40G-FD, Flow-Control). At the bottom, there are buttons for 'Print', 'View Details', 'Probe', 'Sync', 'Apply', 'OK', and 'Cancel'.

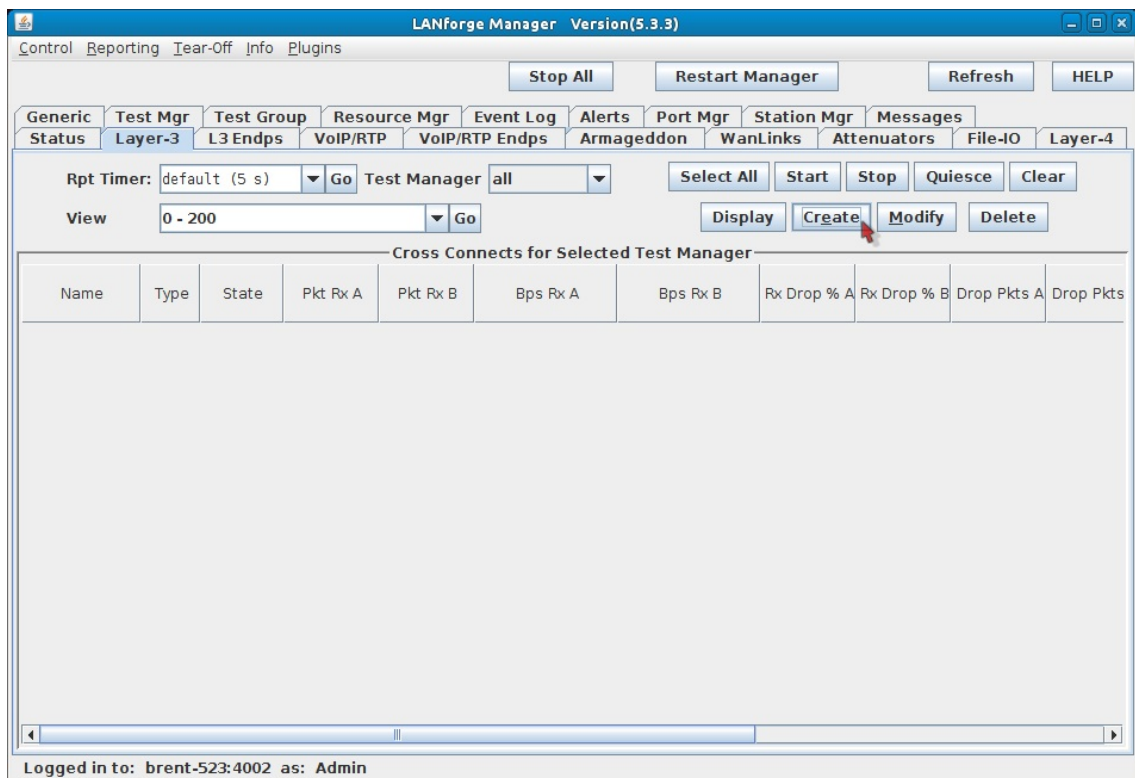
I. Set the **IP Address** to 195.1.3.2/24

II. Set the **Gateway IP** to 195.1.3.1

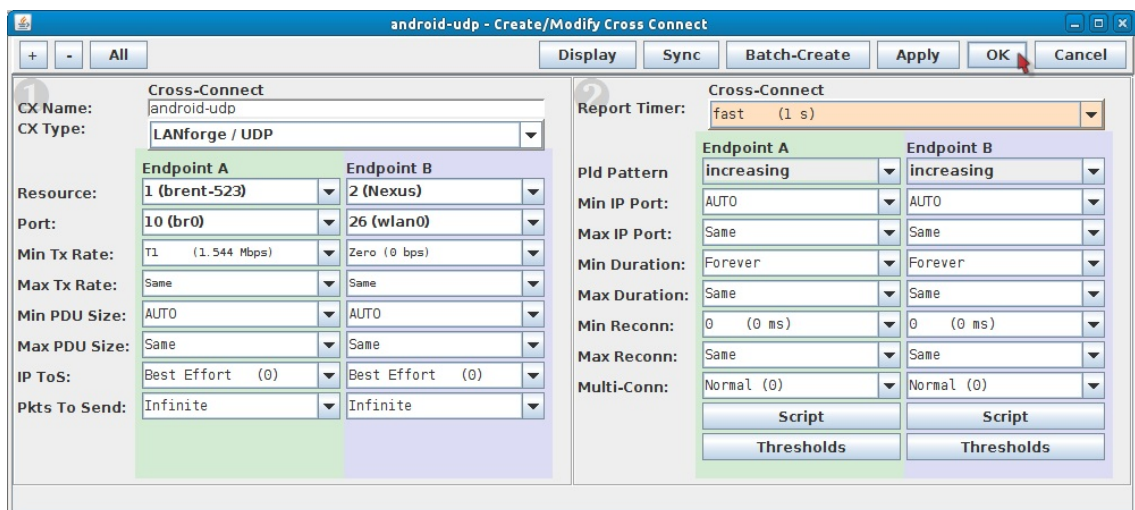
III. Click **OK**.

I. Close NetSmith.

C. Go to the **Layer-3** tab, click **Create**.

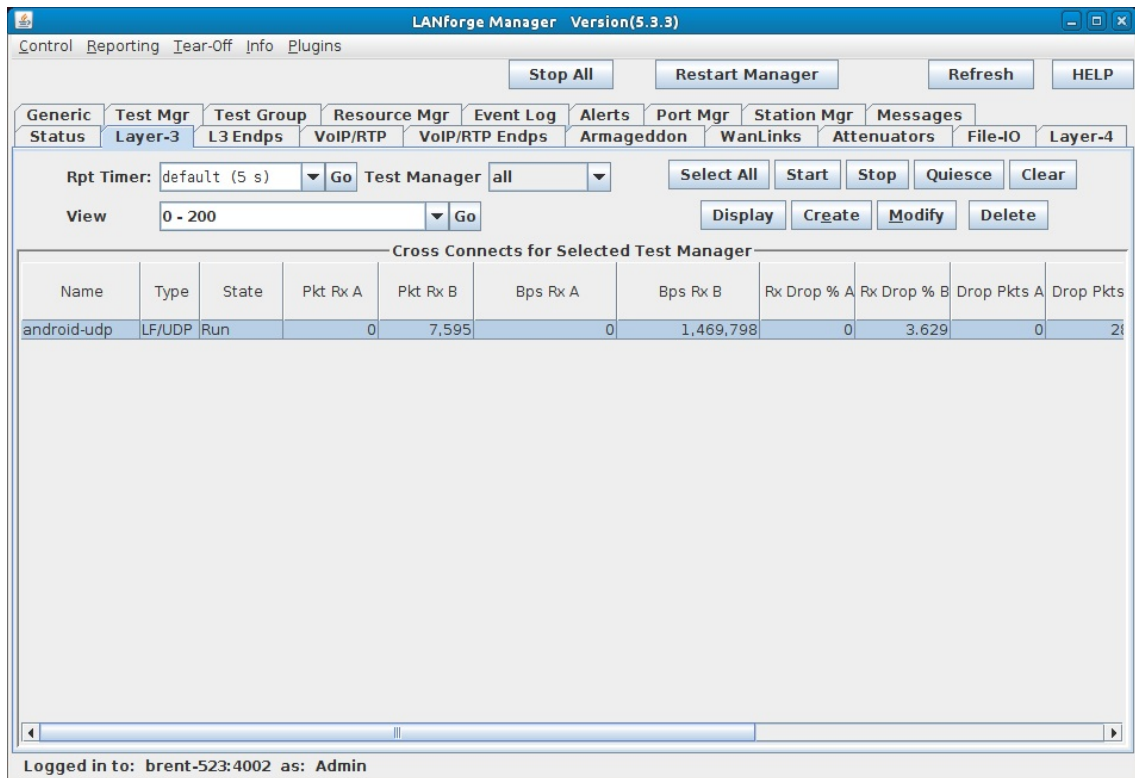


D. Set the below values. Note that Endpoint B Resource will differ depending on the Android device type.



- A. CX Name: **android-udp**
- B. Endpoint A Resource: **brent-523**
- C. Endpoint B Resource: **Nexus**
- D. Endpoint A Port: **br0**
- E. Endpoint B Port: **wlan0**
- F. Endpoint A Min Tx Rate: **T1 (1.544 Mbps)**
- G. Endpoint B Min Tx Rate: **Zero (0 bps)**
- H. Report Timer: **fast (1 s)**
- I. Click **OK**.

E. Start running traffic.



- A. Select the android-udp connection.
- B. Click **Start**.

F. Connect your Android device to **android-test2**. Traffic should start flowing again after about 20-30 seconds.

