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TECHNOLOGIES

Network Testing and Emulation Solutions

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Generating Traffic for WLAN Testing

Goal: Setup and run Wireless LAN traffic using the LANforge CT523 or similar system. In this test scenario, the LANforge CT523 is used to simulate 4 virtual wireless stations that associate with a third party access point. Three traffic tests will be configured and run to demonstrate possible wireless access point tests. **NOTE:** This cookbook assumes that you have already created a VAP, and have an interface that is handing out DHCP addresses.
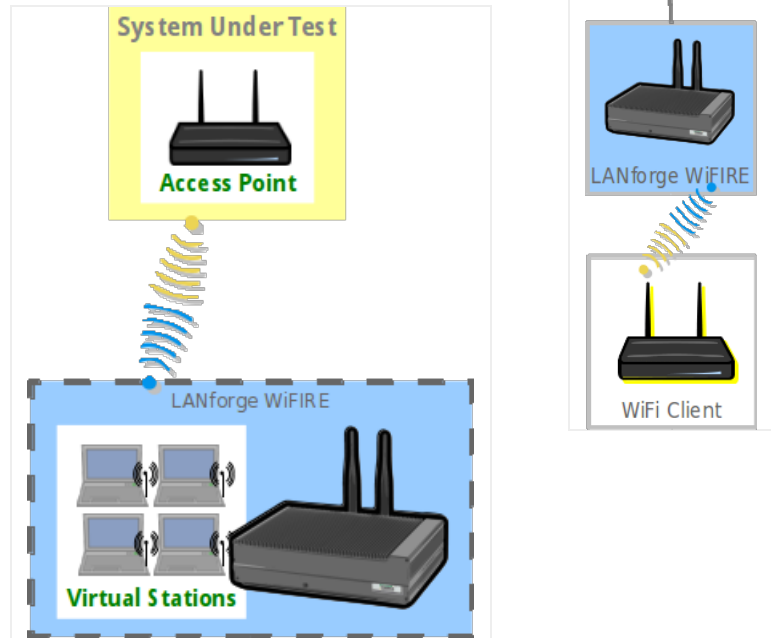
1. Create the virtual wireless stations.

   Note: All of its virtual stations will use the same wireless AP in this example, but each station *may* be configured for a different AP as long as all stations on the same radio use APs on the same channel.

A. Go to the Port Manager

B. Select port wiphy0 and click Create

C. Select the **Wifi STA** button, then enter **MAC**, **Quantity**, **STA ID**, and **SSID**. Select the DHCP-IPv4 checkbox:

Create VLANs on Port: 1.1.03

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 (1f0350-81e8) ▼   Port: 3 (wiphy0) ▼

③ Quantity: 4

| Basic Settings | WiFi Settings | Advanced Settings |

VLAN ID: [　　　　　　]

STA ID: 0

Parent MAC: 04:f0:21:38:ad:b3

MAC Addr: xx:xx:xx:*:*:xx ▼

④ ☐ DHCP-IPv4   ☐ Multiple Subnets

IP Address: [　　　　　　]

IP Mask or Bits: [　　　　　　]

Gateway IP: [　　　　　　]

#1 Redir Name: [　　　　　　]

#2 Redir Name: [　　　　　　]

⑤ ☐ Down   [Apply]   [Cancel]   [Ready]

A. In this example, all 4 virtual stations will connect to the same access point

B. If your access point can serve DHCP, you can select the 'DHCP-IPv4' checkbox here to enable each virtual station as a DHCP client

C. If you choose to enter IP addresses manually, the create function will increment the last octet of the IP address for each virtual station created

D. Click **Apply** when finished

D. Verify that the virtual wireless stations are created

LANforge Manager   Version(5.4.1)

Control   Reporting   Tear-Off   Info   Plugins

[Chamber View]   [Stop All]   [Restart Manager]   [Refresh]   [HELP]

Event Log	Alerts	Port Mgr	vAP Stations	DUT	Profiles	Traffic-Profiles	Messages
Attenuators		RF-Generator	File-IO	Layer 4-7	Generic	Test Mgr	Test Group	Resource Mgr
Status	Layer-3	L3 Endps	VoIP/RTP	VoIP/RTP Endps	Armageddon	WanLinks

Disp: 192.168.100.121:0   [Sniff Packets]   ☑ Down ↕   [Clear Counters]   [Reset Port]   [Delete]

Rpt Timer: medium (8 s) ▼   [Apply]   ☐ VRF ↕   [Display]   [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	☐	☐	192.168.100.216	0	eth0		104,514,688	1,364,054	15	13,122	230,922,952	230,972	16	
1.1.01	☐	☐	10.1.1.7	0	eth1		747,276	4,850	0	48	699,364	4,990	0	
1.1.02	☐	☑	0.0.0.0	0	eth2		0	0	0	0	0	0	0	
1.1.03	☐	☐	0.0.0.0	0	wiphy0		8,770,822,...	13,489,...	37	73,887	4,797,568,...	3,196,706	0	
1.1.04	☐	☐	0.0.0.0	0	wiphy1		0	109	0	0	0	0	0	
1.1.05	☐	☑	0.0.0.0	0	wlan0	wiphy0	1,026	3	0	0	2,082	13	0	
1.1.06	☐	☑	0.0.0.0	0	wlan1	wiphy1	0	0	0	0	0	0	0	
1.1.07	☐	☐	10.1.5.11	0	sta0	wiphy0	2,371,710,...	1,580,197	0	35	2,443,823,...	1,608,241	0	
1.1.10	☐	☐	10.1.5.8	0	sta1	wiphy0	2,358,154,...	1,572,053	0	0	2,457,516,...	1,616,318	0	
1.1.11	☐	☐	10.1.5.9	0	sta2	wiphy0	444,146	3,281	0	0	511,478	3,871	0	
1.1.13	☐	☐	10.1.5.10	0	sta3	wiphy0	442,070	3,263	0	35	511,714	3,861	0	

E. Scroll to the right to view each station's link quality and other interface details

LANforge Manager   Version(5.4.1)

Control   Reporting   Tear-Off   Info   Plugins

| Chamber View | Stop All | Restart Manager | Refresh | HELP |

Event Log | Alerts | Port Mgr | vAP Stations | DUT | Profiles | Traffic-Profiles | Messages
Attenuators | RF-Generator | File-IO | Layer 4-7 | Generic | Test Mgr | Test Group | Resource Mgr
Status | Layer-3 | L3 Endps | VoIP/RTP | VoIP/RTP Endps | Armageddon | WanLinks

Disp: 192.168.100.121:0   Sniff Packets   ☑ Down ↕   Clear Counters   Reset Port   Delete

Rpt Timer: medium (8 s) ▼   Apply   ☐ VRF ↕   Display   Create   Modify   Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

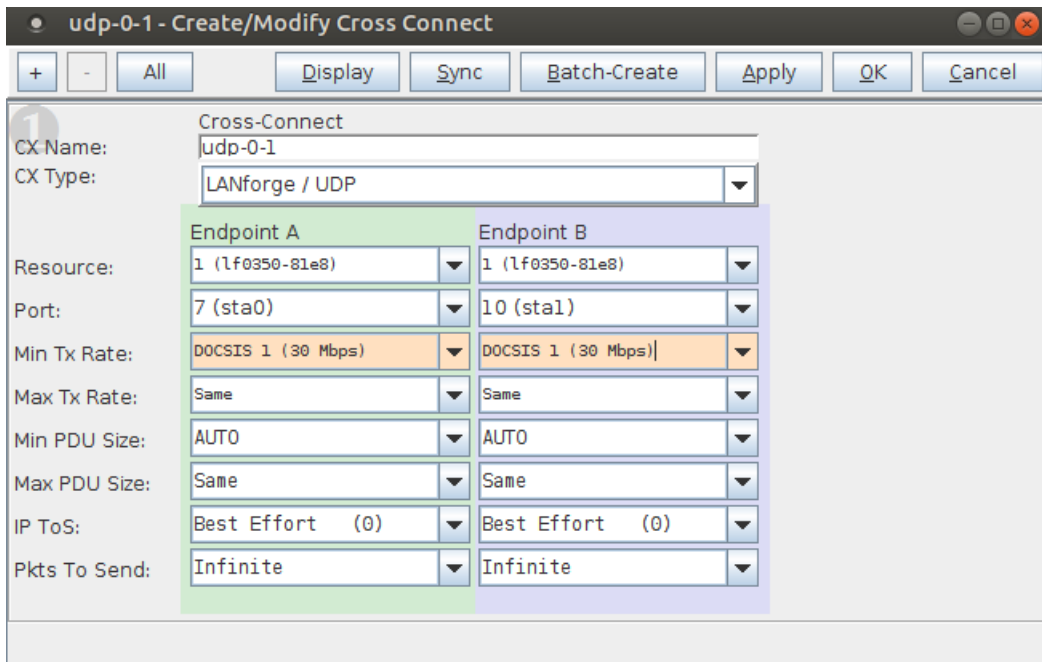| d	bps TX LL	Bytes TX LL	bps RX LL	Bytes RX...	Reset	TX-Rate	RX-Rate	Status	AP	Channel	Mode	Activity	Sig
0	144,706	238,555...	16,677	137,491...	Complete	1 Gbps	1 Gbps					0	
0	0	819,124	0	863,676	Complete	1 Gbps	1 Gbps					0	
0	0	0	0	0	Complete	0 bps	0 bps					0	
0	23	4,797,5...	73,965	8,771,9...	Complete		0 bps			0	802.11a...	1	
0	0	0	0	0	Complete		0 bps			0	802.11a...	0	
0	0	2,082	0	1,026	Complete	0 Mbps	0 bps	NONE	Not-Ass...	0	802.11a...	1	0 dBm
0	0	0	0	0	Complete	0 Mbps	0 bps	NONE	Not-Ass...	0	AUTO 20	0	0 dBm
0	0	2,443,8...	0	2,371,7...	Complete	6 Mbps	351 Mbps	Authorized	04:F0:21...	36	802.11a...	1	-63 dE
0	0	2,457,5...	0	2,358,1...	Complete	6 Mbps	351 Mbps	Authorized	04:F0:21...	36	802.11a...	1	-63 dE
0	39	511,964	34	444,572	Complete	6 Mbps	351 Mbps	Authorized	04:F0:21...	36	802.11a...	1	-63 dE
0	0	511,714	0	442,070	Complete	87.8 Mbps	351 Mbps	Authorized	04:F0:21...	36	802.11a...	1	-63 dE

For more information see LANforge User's Guide: Ports (Interfaces)

2. Create Layer-3 connections between the station interfaces.
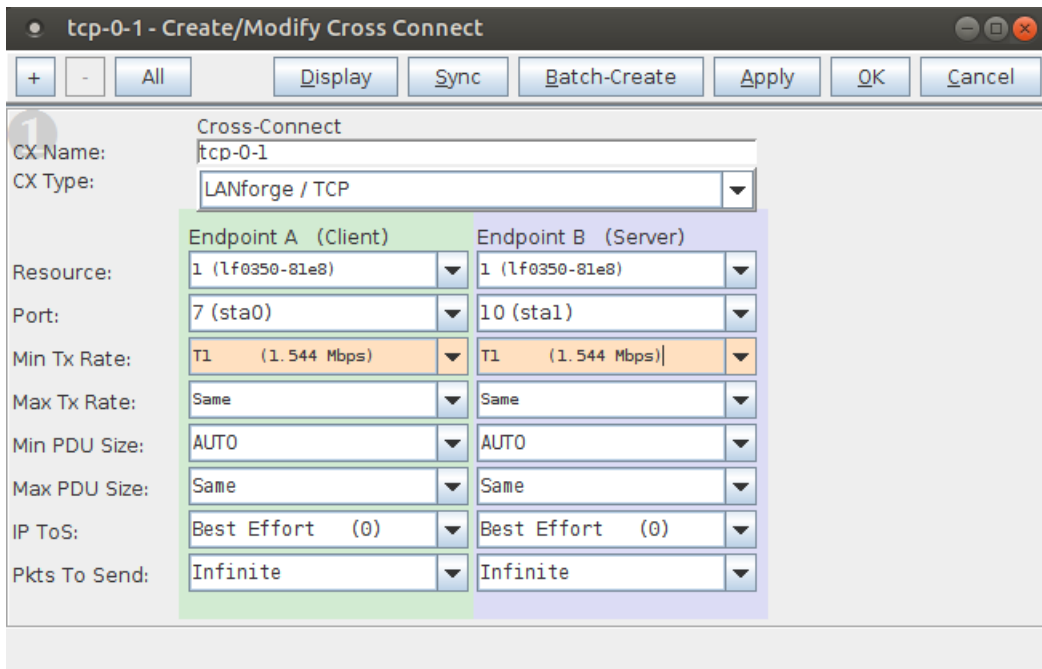
    A. Go to the **Layer-3** tab and click **Create**
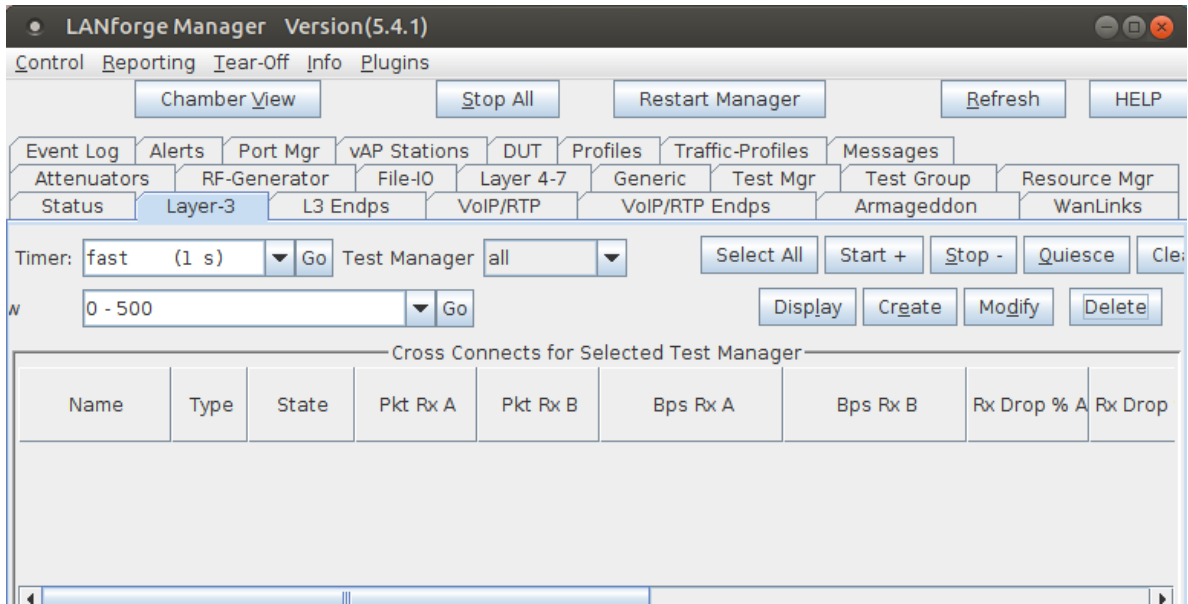
    B. Create a station-to-station UDP speed test:

        A. **Test 1**: sta0-sta1, UDP, 30Mbps

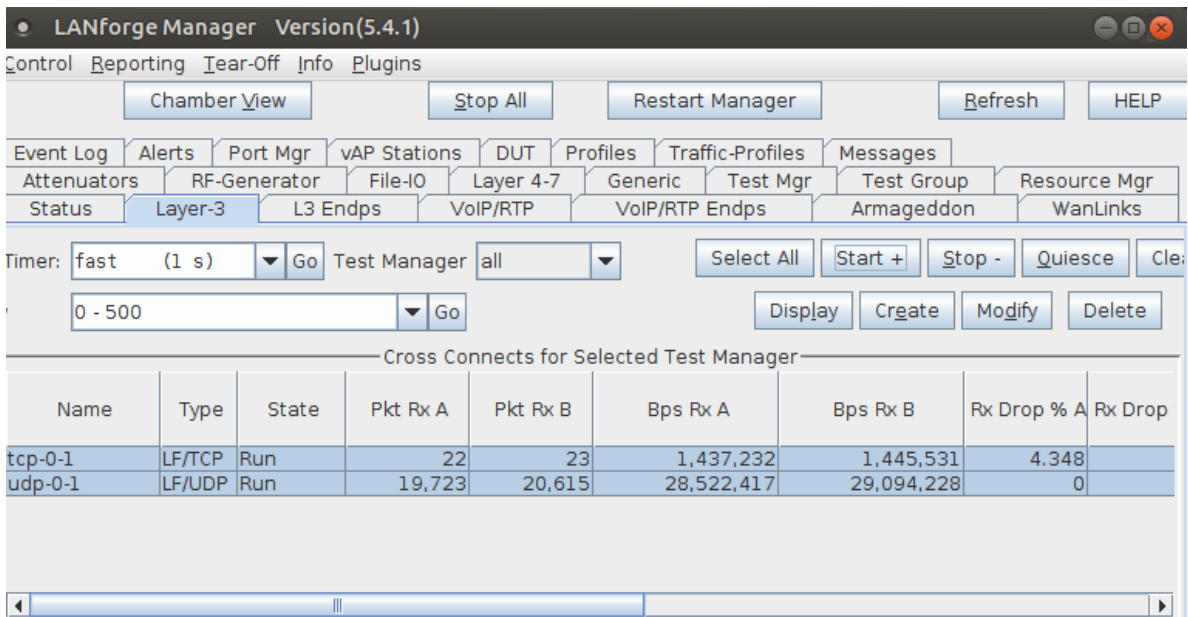C. Create a station-to-station TCP speed test:

tcp-0-1 - Create/Modify Cross Connect

| + | - | All | Display | Sync | Batch-Create | Apply | OK | Cancel |

Cross-Connect

CX Name: tcp-0-1

CX Type: LANforge / TCP

	Endpoint A (Client)	Endpoint B (Server)
Resource:	1 (lf0350-81e8)	1 (lf0350-81e8)
Port:	7 (sta0)	10 (sta1)
Min Tx Rate:	T1 (1.544 Mbps)	T1 (1.544 Mbps)
Max Tx Rate:	Same	Same
Min PDU Size:	AUTO	AUTO
Max PDU Size:	Same	Same
IP ToS:	Best Effort (0)	Best Effort (0)
Pkts To Send:	Infinite	Infinite

A. **Test 1**: sta0-sta1, TCP, 1.54Mbps bi-directional traffic

For more information see LANforge User's Guide: Layer-3 Cross-Connects (FIRE)

3. Run traffic tests concurrently, and view results.
   A. This example shows little packet loss, however being that this is traffic sent wirelessly via stations, their may be interruptions due to busy channel frequencies, if needed, adjust your Tx rate accordingly.

LANforge Manager Version(5.4.1)

Control Reporting Tear-Off Info Plugins

| Chamber View | Stop All | Restart Manager | Refresh | HELP |

Event Log	Alerts	Port Mgr	vAP Stations	DUT	Profiles	Traffic-Profiles	Messages
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Status	Layer-3	L3 Endps	VoIP/RTP	VoIP/RTP Endps	Armageddon	WanLinks

Timer: fast (1 s) Go Test Manager all

| Select All | Start + | Stop - | Quiesce | Clea |

0 - 500 Go

| Display | Create | Modify | Delete |

Cross Connects for Selected Test Manager

Name	Type	State	Pkt Rx A	Pkt Rx B	Bps Rx A	Bps Rx B	Rx Drop % A	Rx Drop
tcp-0-1	LF/TCP	Run	22	23	1,437,232	1,445,531	4.348	
udp-0-1	LF/UDP	Run	19,723	20,615	28,522,417	29,094,228	0	

B. The **Layer-3 Endpoints** tab has more detail.

C. Select the cross-connects or endpoints and Right-Click → Dynamic Report on the **L3 Endp** or **Layer-3** table to view a live report of the connections.
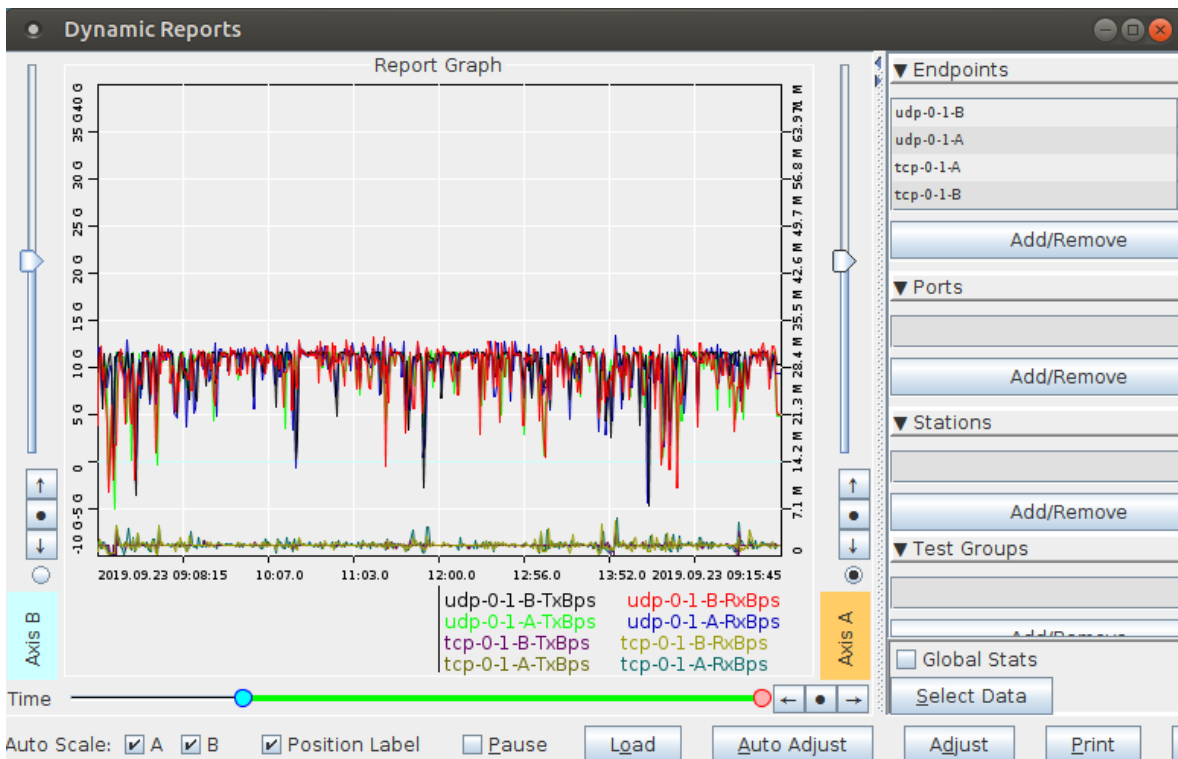
For more information see LANforge User's Guide: Layer-3 Endpoints (FIRE)
For more information see LANforge User's Guide: Reporting