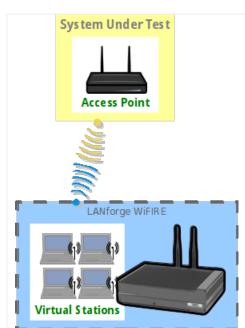


Generating Traffic for WLAN Testing

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

LANforge Manager Version(5.4.1)										
Control Reporting Iear-Off Info Plugins										
Chamber View Stop All Restart Manager Refresh HELP										
Test Mgr / Test Group / Resource Mgr / Event Log / Alerts / Port Mgr / vAP Stations / DUT / Profiles / Traffic-Profiles / Messages										
Status Layer-3 L3 Endps VolP/RTP VolP/RTP Endps Armageddon WanLinks Attenuators RF-Generator File-10 Layer 4-7	Generic									
Disp: 192.168.100.121:0 Sniff Packets Down 1 Clear Counters Reset Port Delete										
Rpt Timer: medium (8 s) ▼ Apply □ VRF I Display Crgate Modify Batch Mod	fy									
-All Ethernet Interfaces (Ports) for all Resources.										
Port Pha Down IP SEC Alias Parent RX Bytes RX Pkts Pps RX bps RX TX Bytes TX Pkts Pps TX	bps TX									
	4 112,651									
	<u> </u>									
	0 (
	0 50									
	0 (
	0 (

B. Select port wiphy0 and click Create

٠	Create VLANs or	n Port: 1.1.03			
•	O MAC-VLAN	802.1Q-VLAN	○ <u>R</u> edirect	○ <u>B</u> ridge	⊖ Bond
9	GRE Tunnel	⊖ <u>W</u> iFi STA	⊖ WiFi <u>V</u> AP	⊖ WiFi Monitor	🔾 WiFi Virtual Radio
2	Shelf: 1 💌 I	Resource: 1 (lf03	50-81e8) 🔻	Port: 3 (wiphy0)
B	<u>Q</u> uantity: 1				
	Basic Settings	WiFi Settings	Advanced S	ettings	
	VLAN ID:]		
	STA ID:]	
	Parent MAC:	04:f0:21:38:ad:	b3]	
	MAC Addr:	xx; xx; xx; *; *; xx;	-]	
4	DHCP-IPv4	Multiple Subn	ets		
	IP Address:]	
	IP Mask or Bits:]	
	<u>G</u> ateway IP:]	
	#1 Redir <u>N</u> ame:]	
	#2 Redir Name:				
6	Down Ap	ply <u>C</u> ancel		Ready	

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			● 🛛 😣
•	O MAC-VLAN	© 802.1Q-VLAN	○ <u>R</u> edirect	○ <u>B</u> ridge	O Bond
U	⊖ GRE Tunnel	◉ <u>W</u> iFi STA	⊖ WiFi <u>V</u> AP	○ WiFi Monitor	🔾 WiFi Virtual Radio
2	Shelf: 1 💌 F	Resource: 1 (lf03	50-81e8) 🔻	Port: 3 (wiphy0) 🗸
B	Quantity: 4				
	Basic Settings	WiFi Settings	Advanced S	ettings	
	VLAN ID:]	
	STA ID:	0		Ī	
	Parent MAC:	04:f0:21:38:ad:	b 3]	
	MAC Addr:	XX:XX:XX:*:*:XX	•		
4	DHCP-IPv4	🗌 Multiple Subn	ets		
	IP Address:]	
	IP <u>M</u> ask or Bits:]	
	<u>G</u> ateway IP:]	
	#1 Redir <u>N</u> ame:				
	#2 Redir Name:				
6	Down Ap	ply <u>C</u> ancel		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

I LAI	LANforge Manager Version(5.4.1)													
<u>C</u> ontrol	Control <u>R</u> eporting <u>T</u> ear-Off <u>I</u> nfo <u>P</u> lugins													
	Chamber View Stop All Restart Manager Refresh HELP													
														_
Event L	og 🛛 A	lerts	Port Mgr 🛛 🗸	AP Statio	ons DUT	Profi	les Traffic-P	rofiles M	essages					
Atter	nuator	s	RF-Genera	tor	File-IO	La	yer 4-7	Generic	Test M	lgr	Test Group	Res	ource Mgr	٦
State	us	i	.ayer-3	L3 End	lps	VolP	/RTP	VoIP/RTP	Endps		Armageddon		WanLinks	
Dien	102	160.1	00.121:0	Cniff	Packets	1 1	Down 1	Clear Cou	ntoro	Reset Po	rt Delete			
Disp	192	100.1	00.121:0	51111	Fackets	ļ	Down 1	clear cou	niters	Reset FO	Delete			
Rpt	Timer:	mediu	um (8s) ▼	A	pply] [VRF I	Disp <u>l</u> a	у	Cr <u>e</u> ate	Mo <u>d</u> ify	<u>B</u> atch	n Modify	
					——All E	thernet	Interfaces (Po	orts) for all F	lesources.					_
Port	Pha	Down	IP	SEC	Alias	Parent Dev	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX	Ł
						000								
1.1.00			192.168.100.2	216 0	eth0		104,514,688						16	1
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		C	0	0	0	0	0	0	
1.1.03			0.0.0.0	0	wiphy0		8,770,822,		37	73,887	4,797,568,	3,196,706	0	
1.1.04			0.0.0.0	0	wiphyl		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	C	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	stal	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	0v/dgiw	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)												
<u>C</u> o	<u>C</u> ontrol <u>R</u> eporting <u>T</u> ear-Off <u>I</u> nfo <u>P</u> lugins												
	Chamber <u>V</u> iew <u>S</u> top All Restart Manager <u>R</u> efresh HELP												
_													
E			5	AP Stations			raffic-Profil		<u> </u>		/		
[Attenuator	V	RF-Generato			Layer 4-7	Generi		st Mgr	Test Gro	· · · · · · · · · · · · · · · · · · ·	Resource M	<u> </u>
	Status	Layer-	3	L3 Endps	Vol	IP/RTP	VoIP,	/RTP Endps		Armagedo	lon [WanLin	cs
C	isp: 192.16	8.100.121	:0	Sniff Packet	s	🗹 Down	1 Clear	Counters	Reset	Port [Delete		
F	pt Timer:	edium (8	s) 🔻	Apply			1 D	isp <u>l</u> ay	Cr <u>e</u> a	te N	40 <u>d</u> ify	Batch Mod	dify
_					All Etherne	t Interfaces	(Ports) for	all Resource	es. ——				
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	
		819,124	0		Complete		1 Gbps					0	
Ī	_	010,124	0		Complete		0 bps					0	
0		4,797,5	73,965				0 bps			0	802.11a	1	
0	0	0	0	0	Complete		0 bps			0	802.11a	0	
0		2,082			Complete		0 bps	NONE	Not-Ass	0	802.11a		0 dBn
0		0	0		Complete	0 Mbps	0 bps	NONE	Not-Ass	0	AUTO 20	0	0 dBn
0		2,443,8	0		Complete	6 Mbps	351 Mbps	Authorized			802.11a	-	-63 df
		2,457,5	0 34		Complete Complete	6 Mbps 6 Mbps		Authorized Authorized			802.11a		-63 dł -63 dł
		511,964 511,714						Authorized			802.11a 802.11a		-63 dt

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

LANforge Manager Version	ı(5.4.1)			● • ×
<u>Control</u> <u>Reporting</u> <u>Tear-Off</u> <u>I</u> nfo	<u>P</u> lugins			
Chamber ⊻iew	<u>S</u> top All	Restart Manage	r <u>R</u> efr	resh HELP
Event Log Alerts Port Mgr v Attenuators RF-Generator 1 Status Layer-3 L3 End	File-IO Layer 4-7	ofiles Traffic-Profile Generic Test M VoIP/RTP Endps		Resource Mgr WanLinks
Timer: fast (1 s) 🔽 Go Te	est Manager all	▼ Select A	ll Start + <u>S</u> top -	Quiesce Clea
w 0-500	Go	Di	sp <u>l</u> ay Cr <u>e</u> ate Mo	dify Delete
		elected Test Manage	r	
Name Type State	Pkt Rx A Pkt Rx B	Bps Rx A	Bps Rx B Rx	Drop % A Rx Drop

B. Create a station-to-station UDP speed test:

• udp-0-1 - C	reate/Modify Cross Co	nne	ct				
+ - All	Display	<u>S</u> yn	c <u>B</u> atch-Create	Ap	ply	<u>0</u> K	<u>C</u> ancel
CX Name: CX Type:	Cross-Connect Judp-0-1 LANforge / UDP			•			
Resource:	Endpoint A 1 (lf0350-81e8)	•	Endpoint B 1 (lf0350-81e8)	•			
Port: Min Tx Rate:	7 (sta0) DOCSIS 1 (30 Mbps)	•	10 (stal) DOCSIS 1 (30 Mbps)	• •			
Max Tx Rate: Min PDU Size:	Same AUTO	•	Same AUTO	• •			
Max PDU Size: IP ToS:	Same Best Effort (0)	•	Same Best Effort (0)	•			
Pkts To Send:	Infinite	•	Infinite	•			

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

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

+ - All	Display	<u>S</u> yn	ic <u>B</u> atch-Create	_Ap	oply <u>O</u> K	<u>C</u> ancel
1	Cross-Connect					
CX Name:	tcp-0-1			_		
СХ Туре:	LANforge / TCP			•		
	Endpoint A (Client)		Endpoint B (Server)			
Resource:	l (lf0350-81e8)	•	l (lf0350-81e8)	-		
Port:	7 (sta0)	-	10 (stal)	-		
Min Tx Rate:	Tl (1.544 Mbps)	-	Tl (1.544 Mbps)	-		
Max Tx Rate:	Same	-	Same	-		
Min PDU Size:	AUTO	-	Αυτο	-		
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)

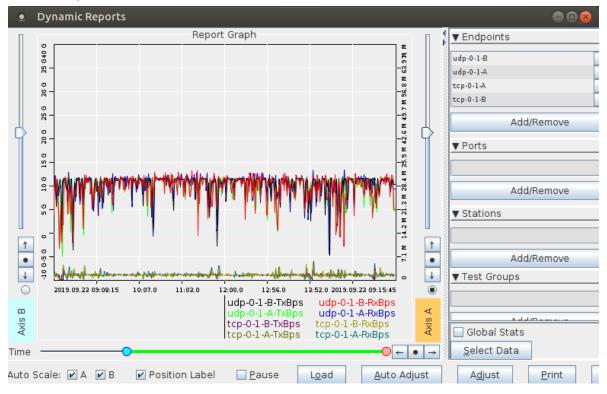
- 3. Run traffic tests concurrently, and view results.
 - A. This example shows little packet loss, however being that this is traffic sent wirelessly via stations, their may be interruptions due to busy channel frequencies, if needed, adjust your Tx rate accordingly.

LANforge Manager Version	n(5.4.1)				● • 8					
Control Reporting Tear-Off Info Plugins										
Chamber ViewStop AllRestart ManagerRefreshHELP										
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										
Timer: fast (1 s) 🔻 Go	Fest Manager	all	▼ Select	All Start + <u>S</u> t	op - Quiesce Cle					
0 - 500	🔻 Go		C)isp <u>l</u> ay Cr <u>e</u> ate	Mo <u>d</u> ify Delete					
		nnects for Se	elected Test Manag	er						
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					
•					Þ					

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

LANforge N	Manager V	/ersio	on(5.4	4.1)				● 🛛 😣	
<u>C</u> ontrol <u>R</u> eporting <u>T</u> ear-Off <u>I</u> nfo <u>P</u> lugins									
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 U Size AUTO Image: Go Max PDU Size Same Image: Go Start + Stop - Quiesce Clear Rate Medem (56 Kbps) Image: Go MAX Tx Rate Same Image: Go Display Create Modify Batch Modify Display									
0 - 1000	– (Go			a da ciata	Disp <u>l</u> ay Cr <u>e</u>	ate Mo <u>d</u> ify <u>B</u>	atch Modify D	
	1			All E	ndpoints ——				
Name	EID	Run	Mng	Script	Tx Rate	Tx Rate (1 min)	Tx Rate (last)	Tx Rate LL	
tcp-0-1-A	1.1.7.7	2	2	None	1,441,042	1,444,123	1,563,483	1,636,842	
tcp-0-1-B	1.1.10.8	~	~	None	1,483,618	1,493,826	1,565,038	1,648,968	
udp-0-1-A	1.1.7.5	~	~	None	27,559,037	27,565,469	29,943,347	30,596,386	
udp-0-1-B	1.1.10.6	~	2	None	28,705,922	28,804,337	30,432,095	31,337,008	
								•	

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

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