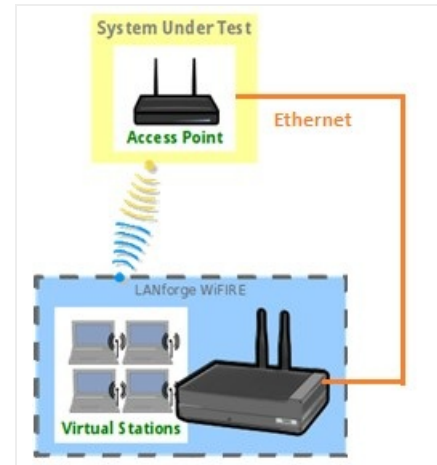


Testing AP Dataplane throughput at different orientation

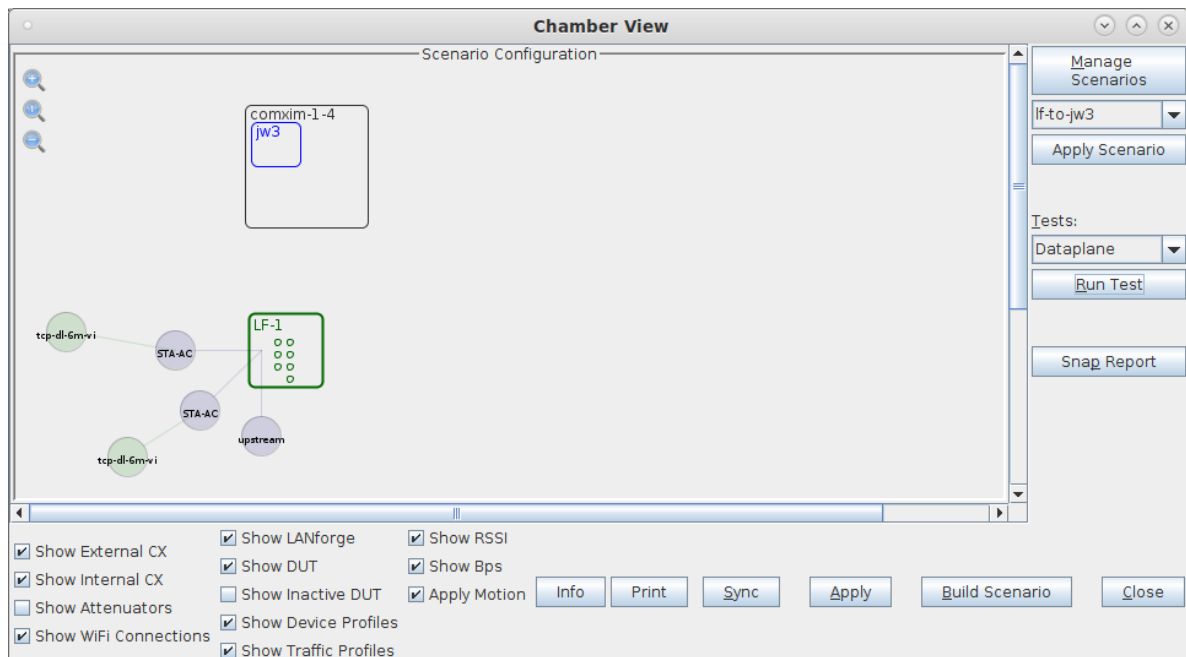
Goal: Setup and run a Dataplane test for an AP using the LANforge CT522 or similar system in order to test how well the AP can handle sending and receiving packets at different rotations.

In this test scenario, the LANforge CT522 is used to generate packets in the upstream and downstream direction through an AP at different AP orientations. An affordable stand-alone turn-table is used to automatically rotate the AP to the desired orientation. This example assumes you have some experience with Chamber View, and that you have a LANforge system and turn-table. Using chambers will make the test perform more consistently, but is not required for this test. This feature requires LANforge version 5.4.1 or higher.



1. Configure Chamber View for Dataplane and Similar Tests.

- A. Open Chamber View by clicking on the 'Chamber View' button in the LANforge-GUI. If you have an appropriate scenario already created, then skip to the next section, otherwise you will need to build a scenario that matches your system. You can right-click in Chamber View to create various objects.



- Create/Modify DUT

Name

jw3

Image file

NONE

Choose Image

x

SW Info

HW Info

complex 3x3, 2x2, wave1

Model Number

Serial Number

Serial port

WAN

LAN

API version

0

SSID-1

jw3-0

Password-1

SSID-2

jw3-1

Password-2

SSID-3

Password-3

Mgt IP

0.0.0.0

Ant-1

0

Ant-2

0

Ant-3

0

BSSID-1

04:f0:21:7b:37:2a

BSSID-2

04:f0:21:f2:ea:bd

BSSID-3

00:00:00:00:00:00

☒ Active
☒ AP DUT

☐ STA DUT
☐ WEP
☐ WPA
☐ WPA2

☐ WPA3
☐ 802.11r
☐ 802.1x EAP-TTLS
☒ Provides DHCP on LAN

☐ Provides DHCP on WAN

Notes

Apply

OK

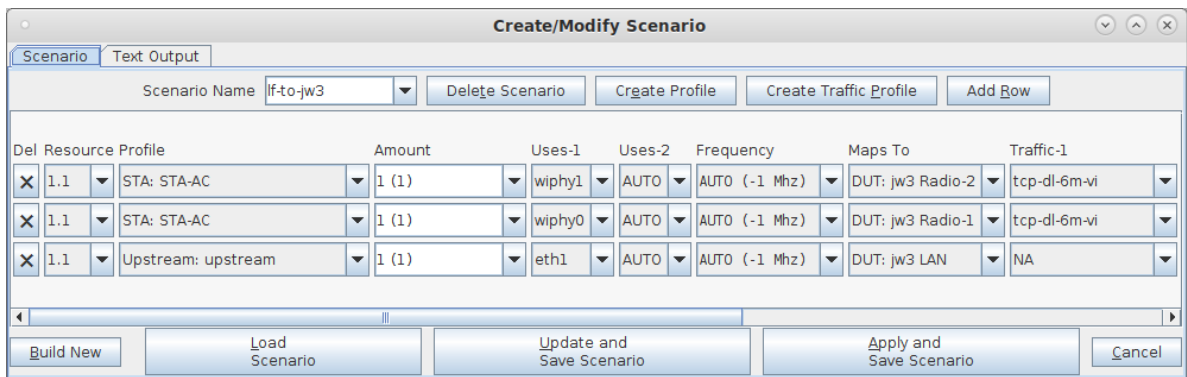
Cancel

- Create/Modify Chamber**

Name:	<input type="text" value="comxim-1-4"/>	Width:	<input type="text" value="100"/>	Height:	<input type="text" value="100"/>				
Chamber Type	<select value="Unknown (0)"></select>	Isolation	<input type="text" value="0"/>	Speed (rpm)	<input type="text" value="0.5"/>				
Turntable Type	<select value="ComXim (1)"></select>	Turntable	<input type="text" value="B242-C213-446E-B2B9"/>	Position (deg)	<input type="text" value="0.0"/>	Tilt (deg)	<input type="text" value="0.0"/>		
Managed By:	<input type="text" value="2 (1f0913-69e7)"/>	Turntable Rpt: Position: 0.0 Tilt: 0.0 RPM: 0.5 Connected				<input type="checkbox"/> Virtual	<input type="checkbox"/> Open		
DUT-1	<select value="JW3"></select>	DUT-2	<select></select>						
DUT-3	<select></select>	DUT-4	<select></select>						
LANforge-1	<select value="None"></select>	LANforge-2	<select value="None"></select>						
LANforge-3	<select value="None"></select>	LANforge-4	<select value="None"></select>						

Int CX A	Int CX B	Int Atten	Ext CX A	Ext CX B	Ext Atten	Atten Floor	Zero-Atten RSSI 2.4Ghz	Zero-Atten RSSI 5Ghz
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	<input type="button" value="v"/>	OTA (0 ddb)	None (0 ddb)	None (0 ddb)

- D. Configure a Chamber View Scenario and add the STA profile (mapped to desired wiphyX radio and DUT). Add an upstream profile mapped to DUT LAN side (or possibly WAN side if that is more appropriate for your DUT).

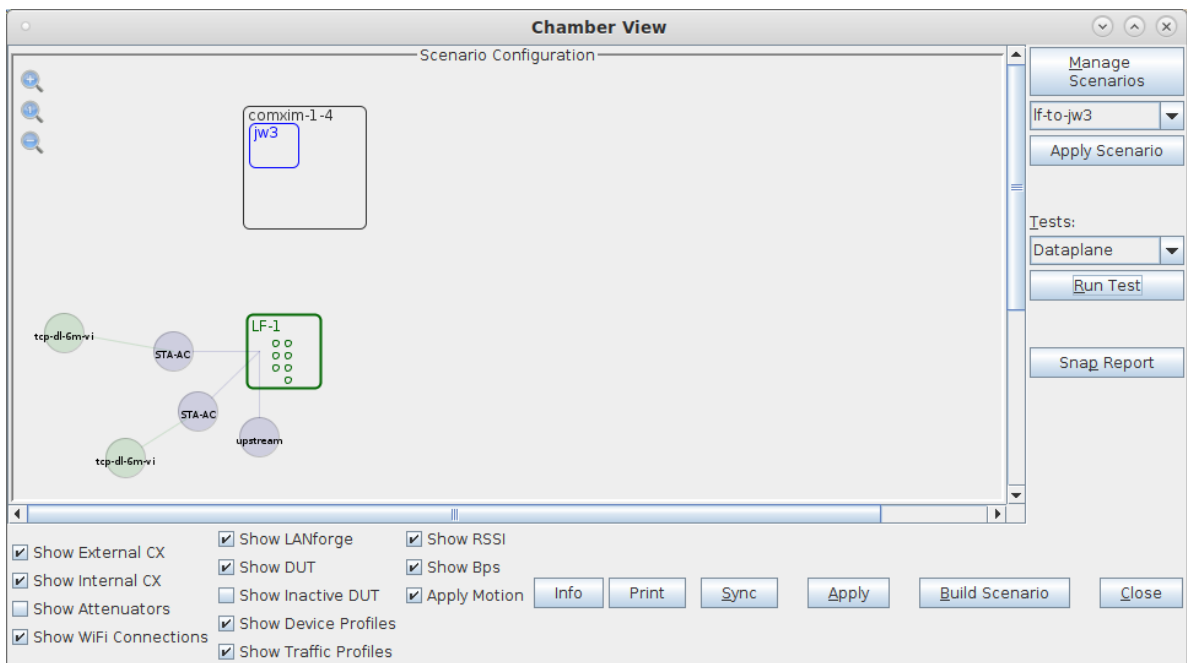


The 'Create/Modify Scenario' dialog box is shown. It has two tabs: 'Scenario' and 'Text Output'. The 'Scenario' tab is active. At the top, there is a 'Scenario Name' field with 'lf-to-jw3' selected, and buttons for 'Delete Scenario', 'Create Profile', 'Create Traffic Profile', and 'Add Row'. Below this is a table with columns: Del, Resource, Profile, Amount, Uses-1, Uses-2, Frequency, Maps To, and Traffic-1. The table contains three rows. At the bottom, there are buttons for 'Build New', 'Load Scenario', 'Update and Save Scenario', 'Apply and Save Scenario', and 'Cancel'.

Del	Resource	Profile	Amount	Uses-1	Uses-2	Frequency	Maps To	Traffic-1
X	1.1	STA: STA-AC	1 (1)	wiphy1	AUTO	AUTO (-1 Mhz)	DUT: jw3 Radio-2	tcp-dl-6m-vi
X	1.1	STA: STA-AC	1 (1)	wiphy0	AUTO	AUTO (-1 Mhz)	DUT: jw3 Radio-1	tcp-dl-6m-vi
X	1.1	Upstream: upstream	1 (1)	eth1	AUTO	AUTO (-1 Mhz)	DUT: jw3 LAN	NA

2. Use Chamber View for Dataplane test.

- A. Open Chamber View by clicking on the 'Chamber View' button in the LANforge-GUI. Load appropriate scenario. Apply the Scenario, then Build the scenario.



- B. Select the **Dataplane** test and click **Run Test**. You should see the Dataplane Test configuration window pop up. It will remember the last configuration for most fields. Select the DUT and WiFi station device, and select the combinations of traffic types and turn-table degrees that you wish to test. The degrees show in this image will go from zero to 359 in steps of 10 degrees. The mouse-over tooltip for the turntable configuration entry field has the details on the available syntax.:

The screenshot shows the 'Dataplane Test' configuration window with the 'Settings' tab selected. The window is divided into several sections for configuring the test parameters.

Selected DUT:	jw3	Duration:	5 sec (5 s)
Downstream Port:	1.1.8 sta0000	Upstream Port:	1.1.1 eth1
Path Loss:	10	Rate:	100%

Channels	Mode	Packet Size	Custom Packet Sizes
AUTO	Auto	60	
No-Change	802.11a	142	
1	802.11b	256	
2	802.11g	512	
3	802.11abg	1024	
4	802.11abgn	MTU	
5	802.11bgn	4000	
6	802.11bg	9000	

Spatial Streams	Security	Bandwidth
AUTO	AUTO	AUTO
1	Open	20
2	WEP	40
3	WPA	80
4	WPA2	160
	WPA3	

Traffic Type	Attenuator:	Turntable
UDP	NONE (0)	comxim-1-4
TCP	200 300 400 500	0...+ 10...359

Direction
DUT Transmit
DUT Receive

At the bottom of the window, there are buttons for 'Start', 'Another Iteration', 'Pause', and 'Cancel'.

- C. You may wish to save/restore configurations or make some advanced configuration on the 'Advanced Configuration' tab.

The screenshot shows the 'Dataplane Test' configuration window with the 'Advanced Configuration' tab selected. This tab provides options to save, load, or delete configurations, as well as specific test parameters.

Action	Configuration Name
Save	DEFAULT
Load	DEFAULT
Delete	DEFAULT

Parameter	Value
IP ToS:	BK (WiFi) (64)
Loop Iterations:	Single (1)
Multi-Conn:	Ten (10)

At the bottom of the window, there are buttons for 'Start', 'Another Iteration', 'Pause', and 'Cancel'.

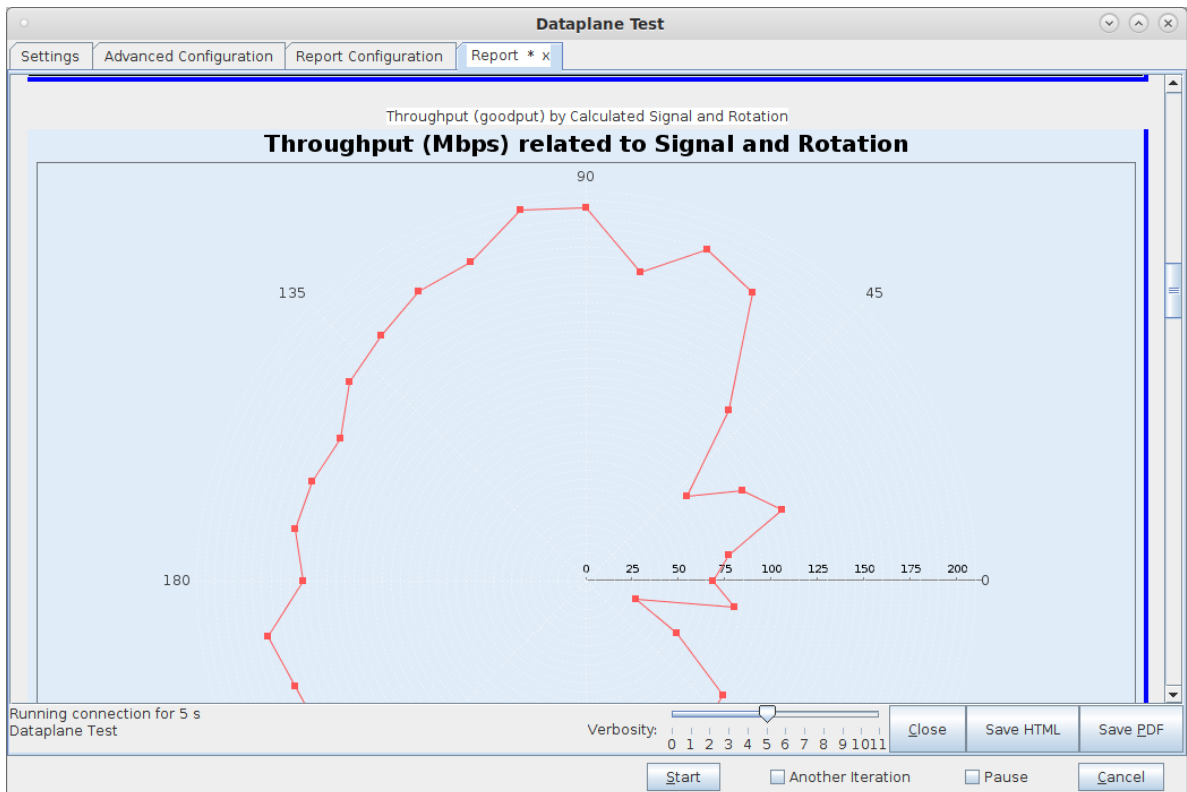
- D. The Report Configuration tab lets you input the operator information, notes about this test setup, and more.

The 'Dataplane Test' window has three tabs: 'Settings', 'Advanced Configuration', and 'Report Configuration'. The 'Report Configuration' tab is active. It contains the following fields and controls:

- ☒ Show Events
- ☐ Show Log Entries
- ☐ Auto Save Report
- ☐ Show 3s Bps Averages
- ☒ Show 1m Bps Averages
- Graph Background Color:
- Operator Information:
- Report Location:
- Notes to be added near the top of the report:

At the bottom are buttons: **Start**, ☐ Another Iteration, ☐ Pause, and **Cancel**.

- E. When the configuration is complete, click the **Start** button (which will change to 'Stop' once start is clicked) to start the test. An interactive report window will be created and will be updated as the test runs.



- F. When the test is complete, click the **Save HTML** button to save an HTML report and generate the PDF. The PDF file will be linked from the HTML page. You can also click 'Save PDF' and the browser will be directed to open the pdf file directly. Please see this [example Dataplane Rotation Test Report](#).

3. Stand-alone Turn Table Information.

- A. We built a cable stand for the stand-alone turn-table to help keep cables out of the way while rotating.



