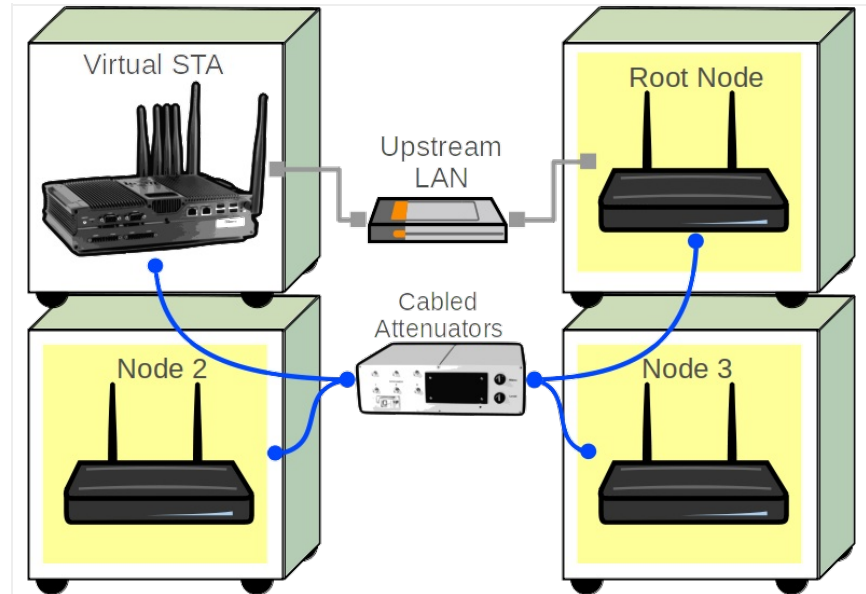


Testing Mesh APs with automated Mesh scenario

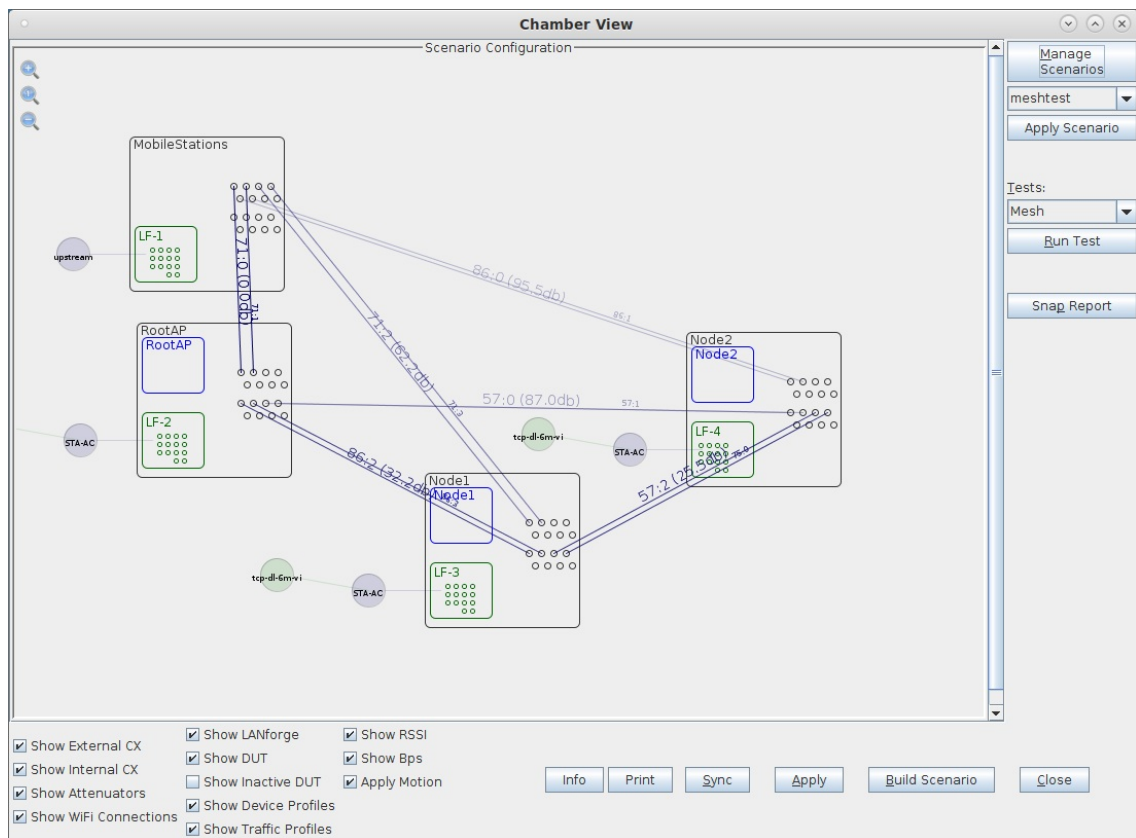
Goal: Setup and run a series of tests in different mesh topologies using the LANforge CT523c or similar system..

In this test scenario, the LANforge CT523c is used to emulate a set of stations that move to different locations relative to a set of mesh APs. Throughput tests are run at each requested topology. A set of 4 chambers are used. One holds the station emulator, the other three hold the mesh APs. Programmable attenuators are used to adjust the signal strength between APs and the station chamber to emulate different topologies. This example assumes you have some experience with Chamber View, and that you have an appropriate LANforge system, programmable attenuators like the CT714 and four isolation chambers like the CT820a. This feature requires LANforge version 5.4.1 or higher.



1. Configure Chamber View for Mesh 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. In this example, the 'Mobilestations' chamber holds the LANforge, and the other chambers hold mesh APs and additional LANforge traffic generating systems. In this example, the LANforge systems in the AP chambers are not used. Your configuration should look like this when these steps are complete.



- B. Create a Device Under Test (DUT) Profile that matches each of your APs. The BSSID is important to configured so that LANforge knows when it is connected to the correct AP.

Create/Modify DUT

Name	RootAP		
Image file	NONE	Choose Image	x
SW Info		HW Info	
Model Number		Serial Number	
Serial port		WAN	
LAN		API version	0
SSID-1	orbimeshtest	Password-1	Lanforge12345!
SSID-2		Password-2	
SSID-3		Password-3	
Mgt IP	0.0.0.0	Num Ant Radio 1	0
Num Ant Radio 2	0	Num Ant Radio 3	0
BSSID-1	8c:3b:ad:2c:b3:4f	BSSID-2	00:00:00:00:00:00
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

- D. Here is an example of the RootAP chamber

Create/Modify Chamber

Name:

RootAP

Width:

150

Height:

150

Chamber Type:

Medium (1)

Isolation:

80

Speed (rpm)

0.0

Turntable Type:

CT850A (0)

Turntable:

Position (deg)

0.0

Tilt (deg)

0.0

Managed By:

None

Turntable Rpt: Position: 0.0 Tilt: 0.0 RPM: 0.0

☐ Virtual

☒ Open

DUT-1:

RootAP

DUT-2:

DUT-3:

DUT-4:

LANforge-1:

2 (Root AP)

LANforge-2:

None

LANforGe-3:

None

LANforGe-4:

None

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
			Chamber.RootAP.8	Chamber.Node1.8	1.1.86.2	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
			Chamber.RootAP.9	Chamber.Node1.9	1.1.86.3	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
			Chamber.RootAP.10	Chamber.Node2.8	1.1.57.0	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
			Chamber.RootAP.11	Chamber.Node2.9	1.1.57.1	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
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						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)

Sync

Apply

OK

Cancel

- E. Here is an example of the Node-1 chamber

Create/Modify Chamber

Name: Node1

Width: 150

Height: 150

Chamber Type: Medium (1)

Isolation: 80

Speed (rpm): 0.0

Turntable Type: CT850A (0)

Turntable:

Position (deg): 0.0

Tilt (deg): 0.0

Managed By: None

Turntable Rpt: Position: 0.0 Tilt: 0.0 RPM: 0.0

☐ Virtual
 ☐ Open

DUT-1: Node1

DUT-2:

DUT-3:

DUT-4:

LANforge-1: 3 (Node1)

LANforge-2: None

LANforge-3: None

LANforge-4: None

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
			Chamber.Node1.10	Chamber.Node2.10	1.1.57.2	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
			Chamber.Node1.11	Chamber.Node2.11	1.1.75.0	OTA (0 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
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						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)
						Cable (100 ddb)	None (0 ddb)	None (0 ddb)

Sync

Apply

OK

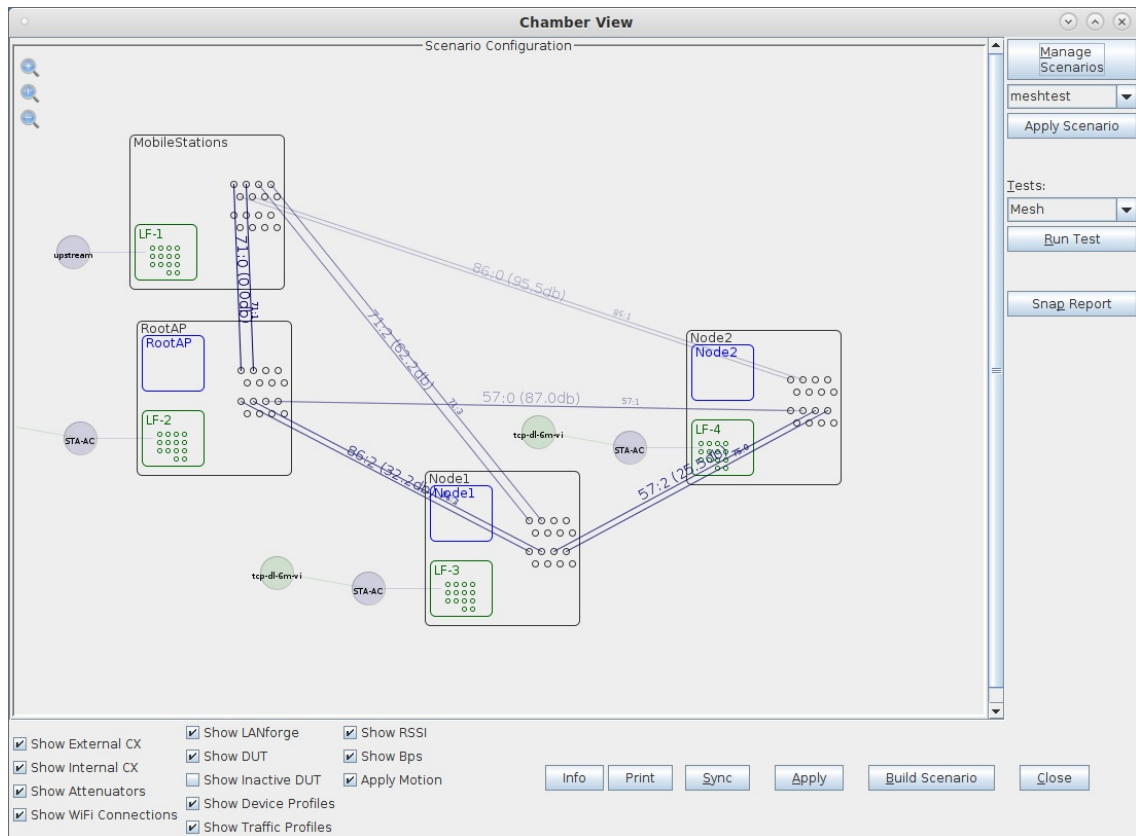
Cancel

F. Here is an example of the Node-2 chamber

G. Configure a Chamber View Scenario. This is somewhat optional since the mesh automation logic will create it's own temporary scenario to run the automation tests.

2. Use Chamber View to start the Mesh 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 **Mesh** test and click **Run Test**. You should see the Mesh Test configuration window pop up. It will remember the last configuration for most fields. Select the resources, topologies and other test config to be used for this test. If you have not run the calibration step previously, run that test first:

Mesh Automated Test

Settings

Advanced Configuration

Report Configuration

Upstream Port:

1.1.1 eth1

Selected DUT 2G:

RootAP orbimeshtest

Selected DUT 5G:

RootAP orbimeshtest

AP Root Chamber

Node 1 Chamber

Node 2 Chamber

STA Chamber

RootAP

Node1

Node2

MobileStations

STA Count

STA Count

STA Count

STA Count

1

1

1

20

2.4Ghz Radios

2.4Ghz Radios

2.4Ghz Radios

2.4Ghz Radios

5Ghz Radios

5Ghz Radios

5Ghz Radios

5Ghz Radios

1.1.2 wiphy0

AP Chamber Position

STA Chamber Position

Traffic Type

Select Tests

Traffic Combination

Current Position

Current Position

UDP

Calibrate

☐ Add STA Traffic

ABC

Random

TCP

Throughput

STA

A-BC

Close Root AP

Root

AB-C

Close Node 1

N1

A-B-C

Close Node 2

N2

A--B-C

Medium Root AP

Root+N1

A-B--C

Medium Node 1

Root+N2

A--B--C

Medium Node 2

N1+N2

Random

Far Root AP

Root+N1+N2

Far Node 1

Far Node 2

Traffic Direction

Download

Upload

Both

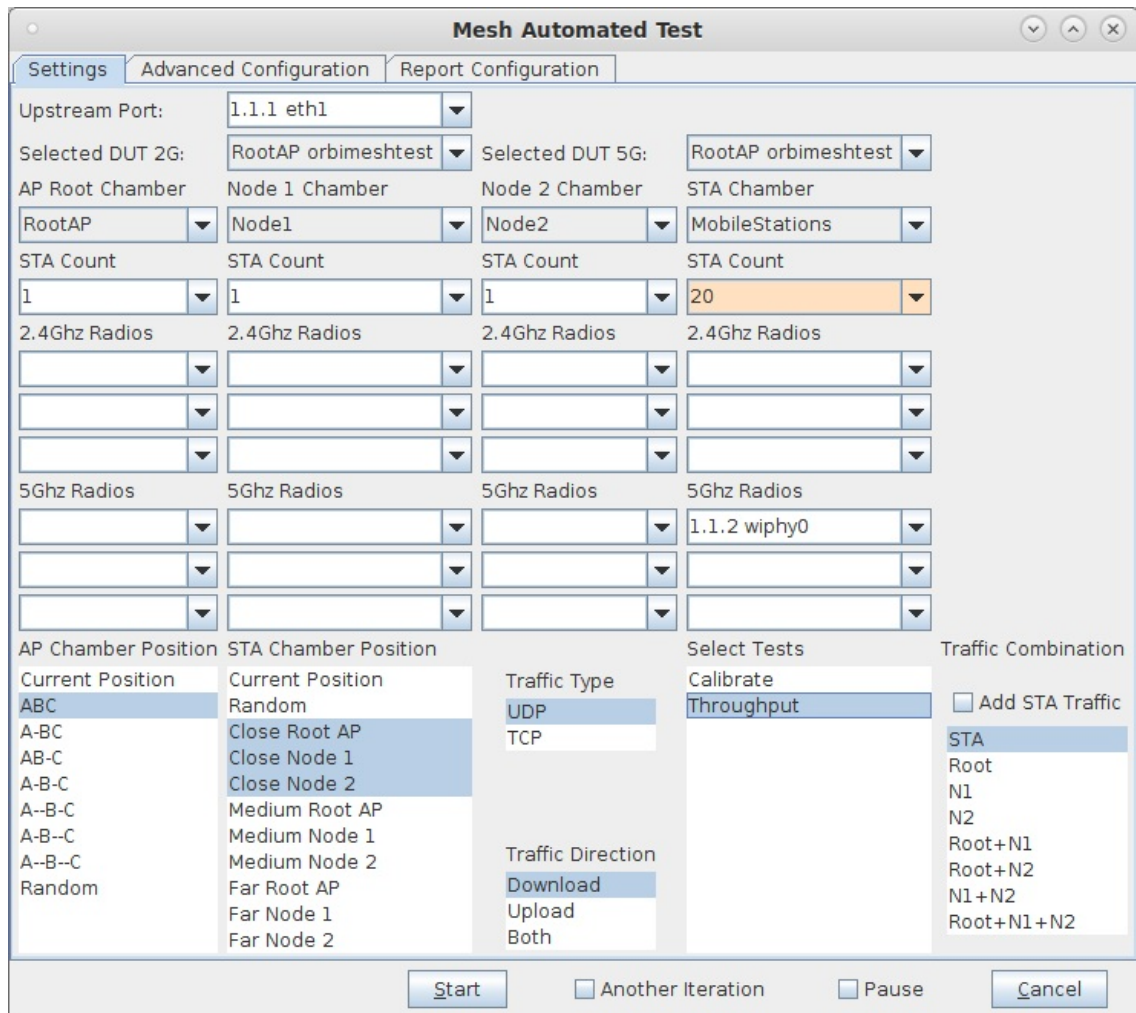
Start

☐ Another Iteration

☐ Pause

Cancel

- C. Once the calibration step is complete, reconfigure to run the throughput tests. In this case, we are using the ABC topology where all three nodes are close to each other. The stations will do throughput tests at each of three positions: Close to Root AP, Close to Node 1, and Close to Node 2. We will generate UDP download traffic. No stations will be created on the LANforge systems inside the AP chambers in this test.:

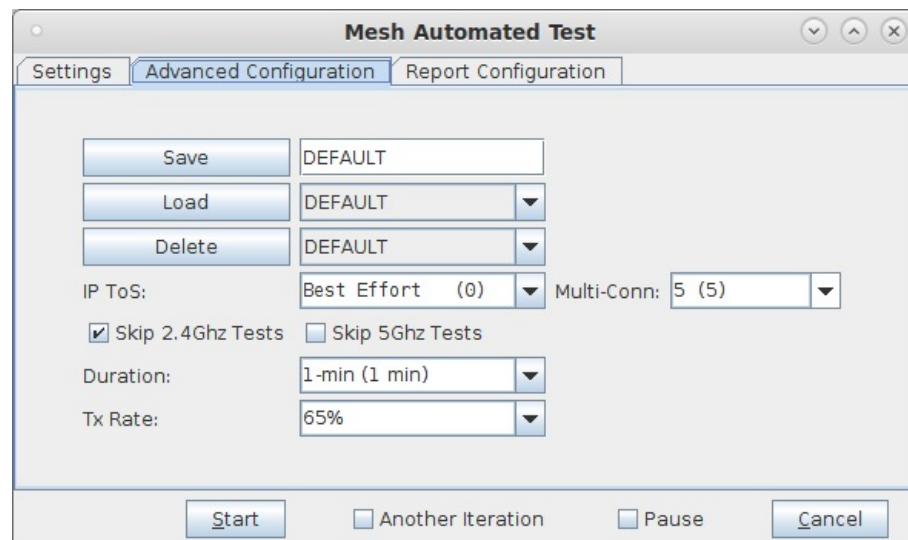


The screenshot shows the 'Mesh Automated Test' window with the 'Settings' tab selected. The configuration is as follows:

- Upstream Port:** 1.1.1 eth1
- Selected DUT 2G:** RootAP orbimeshtest
- Selected DUT 5G:** RootAP orbimeshtest
- AP Root Chamber:** RootAP
- Node 1 Chamber:** Node1
- Node 2 Chamber:** Node2
- STA Chamber:** MobileStations
- STA Count (RootAP):** 1
- STA Count (Node1):** 1
- STA Count (Node2):** 1
- STA Count (MobileStations):** 20
- 2.4Ghz Radios:** All four dropdowns are empty.
- 5Ghz Radios:**
 - RootAP: Empty
 - Node1: Empty
 - Node2: Empty
 - MobileStations: 1.1.2 wiphy0
- AP Chamber Position:**
 - Current Position: ABC
 - Options: A-BC, AB-C, A-B-C, A--B-C, A--B--C, Random
- STA Chamber Position:**
 - Current Position: Random
 - Options: Close Root AP, Close Node 1, Close Node 2, Medium Root AP, Medium Node 1, Medium Node 2, Far Root AP, Far Node 1, Far Node 2
- Traffic Type:** UDP
- Traffic Direction:** Download
- Select Tests:** Calibrate, Throughput
- Traffic Combination:**
 - ☐ Add STA Traffic
 - STA
 - Root
 - N1
 - N2
 - Root+N1
 - Root+N2
 - N1+N2
 - Root+N1+N2

Buttons at the bottom: Start, ☐ Another Iteration, ☐ Pause, Cancel.

- D. Configure the appropriate settings on the Advanced tab. In this case, I am disabling 2.4Ghz and doing a 5Ghz only test.

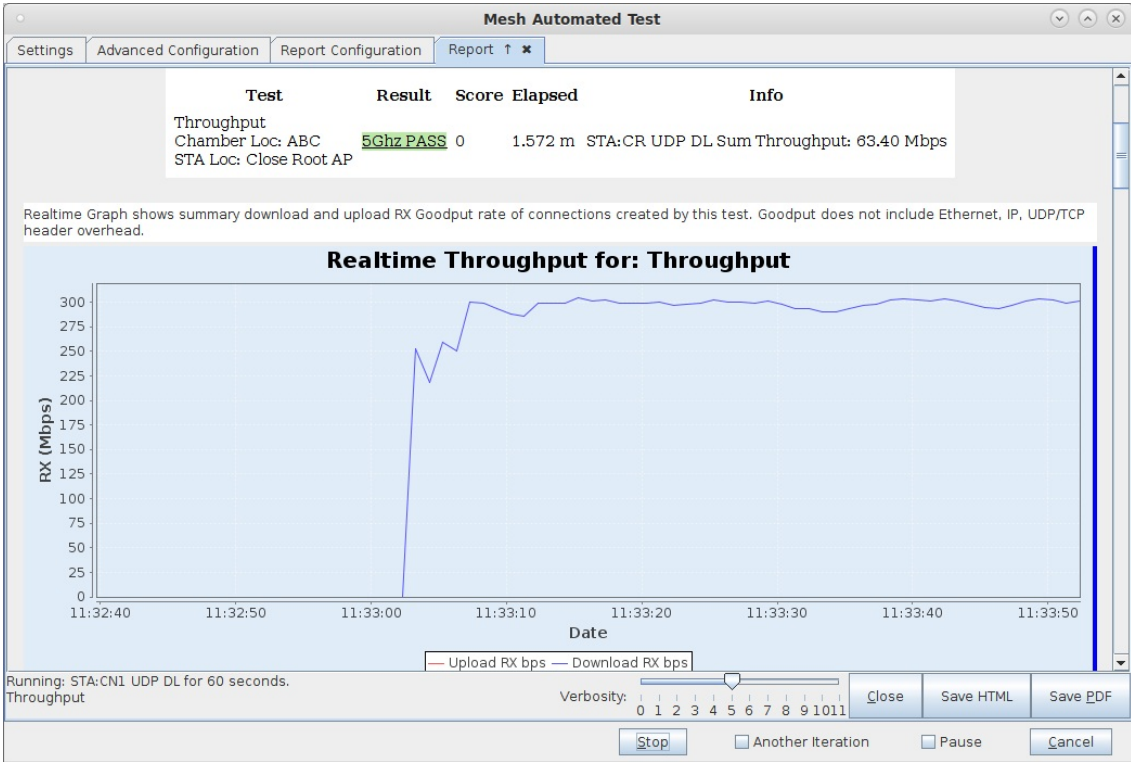


The screenshot shows the 'Mesh Automated Test' window with the 'Advanced Configuration' tab selected. The configuration is as follows:

- Save:** DEFAULT
- Load:** DEFAULT
- Delete:** DEFAULT
- IP ToS:** Best Effort (0)
- Multi-Conn:** 5 (5)
- ☒ Skip 2.4Ghz Tests
- ☐ Skip 5Ghz Tests
- Duration:** 1-min (1 min)
- Tx Rate:** 65%

Buttons at the bottom: Start, ☐ Another Iteration, ☐ Pause, 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 tab will be created and will be updated as the test runs. For each topology, throughput graphs and topology snapshot will be generated.



- 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 Mesh Test Report](#).