LANforge WiFi Rate v. Range Test

**Goal:** Compare WiFi performance for 'upload' traffic (client to AP) using a WiFi access point, a LANforge Attenuator and a LANforge Virtual Station. Traffic is generated by a RFC-2544 script on a Layer-3 UDP connection.

This demo consists of one WiFi access point and one CT523 LANforge WiFIRE machine connected to the LANforge Attenuator with coax SMA cables. (This is not over the air testing). This requires LANforge release 5.2.7 or higher.

1. Create Virtual Station

   ![LANforge Manager Interface]

   - A. Select radio wiphy1 and click **Modify**
B. Set the frequency of the radio to **Auto**

C. On the Port Modify tab, click **Create**

D. Create virtual station with these parameters:

   - A. Select **WIFI STA**
   - B. Choose **DHCP IPv4**
   - C. Quantity 1
   - D. Station ID 0
   - E. SSID 'udpitest'
   - F. Click **Apply**

2. Create upstream port wired to AP
   A. Wire the eth1 port into the upstream connection of the AP under test.
   B. On the **Ports** tab, click on the eth1 port
D. Set the **Gateway** to the AP wired interface IP.

E. Click **OK**

3. **Create and Test Cross Connect**
   
   A. Go to the **Layer 3** tab

   ![Layer 3 Tab]

   A. Click **Create**
B. Create a cross connect with these qualities:

- Make sure Endpoint A is eth1
- Make sure Endpoint B is sta0
- Min PDU Size for both should be 3472
- NOTE: These rate and PDU size settings will be manipulated by the script we setup later.

C. Next, expand the screen to Level 4 using the [+] button.

D. Configure the send buffer on Endpoint B to 1 MB

A. Click OK

E. On the Layer 3 tab, click Start to verify the AP and Station can connect
F. Click the **Display** button to monitor throughput.

G. Only a short confirmation is necessary; click **Stop** on the Layer 3 tab.

4. **Configure Scripting for Cross Connect**
   
   A. On the **Layer-3** tab, click **Modify**
   
   B. In the **Level-2** box, click **Endpoint A Script** button

   ![Cross Connect Script window displays with no parameters](image)

C. The Cross Connect Script window displays with no parameters.
D. Select Script Type: RFC-2544. Set the following parameters:

A. Select Symmetric. This will increment both the A and B rates and payload sizes. (Instead of just side A).
B. Select Show Attenuation. This displays attenuation levels in the report.
C. Run Duration: 10 sec. This is how long each rate setting will be held.
D. Pause Duration: 2 sec. We give it some time to transition.
E. Max Drop Percent: 10%
F. Max Jitter 200ms
G. Max RT Latency 200ms
H. Rates A: 56kbps. This sets the client upload target rate.
I. Rates B: 400Mbps. This sets the client download target rate.
J. Pld A: 1472. This sets the client (stock) MTU. This is a 1500 byte wire packet.
K. Pld B: 9000. This sets the upstream (eth1) MTU.
L. Attenuator Resource: 1.1.2. You can find your attenuator resource in the Attenuator tab.
M. Attenuation: 0.1955. This is shorthand for: Begin at zero dB attenuation, increase in 0.5 dB steps, until 955 dB of attenuation. Individual dB steps could also be specified.
N. Click OK

E. On the Create/Modify Cross Connect window, click OK

5. Run the Cross Connect and Generate a Report
A. On the Layer-3 tab, click Start

B. The Scripting Report window will appear

A. When the script completes, you can view the graphed results.
B. Click on Graphical Display and a window with the graphical report will display
C. Scroll to the top of the window to view the graphs. Highlights are shown below.
D. Attenuation v/s RX signal, endpoint A

Attenuations v/s RX-Signal for endpoint: udptest-A: Requested Rate: 52000, PDU Size: 1472
E. Attenuation v. RX signal, endpoint B

F. TX rate (UDP payload) v. RX signal, endpoint B

G. RX rate including frame headers (UDP payload with frame headers) v. RX signal, endpoint B
H. RX rate v. TX link speed. You see a sawtooth pattern because all attenuations are included.

I. Click on Save File and your browser will appear the the HTML copy of the report.