

Displaying Sequence Gaps

Goal: Generate and show sequence gaps (time between packets) by running traffic through a WanLink with an intermittent latency spike.

Tracking sequence gaps can be useful in the following scenarios:

- Roaming with and without 802.11r.
- OSPF failovers.
- Cellular to WiFi handoff.

In this test scenario, LANforge will be set up to generate sequence gaps. Then the sequence gaps will be shown via the layer-3 display window.

Four physical ports will be used, two to generate traffic and two for the WanLink endpoints. This test uses a **LANforge CT922** system.

LANforge will be generating UDP traffic at 1 Mbps through a WanLink that is scripted to apply one second of latency every ten seconds. The one second latency should create a one second sequence gap. The packet size will be smaller to increase the rate of traffic and thus decreasing sequence gaps, this will make any larger sequence gaps more apparent.

1. Set IPs on traffic generating ports, **eth0** and **eth3** in this case.

A. In the **Port Manager** tab modify **eth0**.

eth0 (brent-6port) Configure Settings

Port Status Information

Current: LINK-UP 1000bt-FD AUTO-NEGOTIATE Flow-Control TSO GSO GRO

Driver Info: Port Type: Ethernet Driver: e1000e(3.2.6-k) Bus: 0000:02:00.0 Cur: 2.5GT/s x1 Max: 2.5GT/s x1

Port Configurables

General Interface Settings

Enable

- ☐ Set IF Down
- ☐ Set MAC
- ☐ Set TX Q Len
- ☐ Set MTU
- ☐ Set Offload
- ☐ Set Rate Info
- ☐ Set PROMISC
- ☐ Set Rx-All/FCS
- ☐ Set Bypass
- ☐ Set Bridge Info
- ☐ Set CPU Mask

Services

- ☐ HTTP
- ☐ FTP
- ☐ RADIUS

General Interface Settings

☐ Down ☐ Aux-Mgt

☐ DHCP-IPv6 ☒ DHCP Release DHCP Vendor ID: None

☐ DHCP-IPv4 ☒ Secondary-IPs DHCP Client ID: None

DNS Servers: BLANK Peer IP: NA

IP Address: 10.0.0.1/24 Global IPv6: AUTO

IP Mask: 0.0.0.0 Link IPv6: AUTO

Gateway IP: 0.0.0.0 IPv6 GW: AUTO

Alias: MTU: 1500

MAC Addr: 00:90:0b:38:82:70 TX Q Len: 1000

Br Cost: ignore Priority: ignore

Rpt Timer: medium (8 s) Watchdog: 0

CPU Mask: NO-SET WiFi Bridge: NONE

Port Rates

- ☐ 10bt-HD
- ☐ 10bt-FD
- ☐ 100bt-HD
- ☐ 100bt-FD
- ☐ 1000-FD
- ☐ 10G-FD
- ☐ 40G-FD
- ☒ Autonegotiate

Renegotiate

Restart Xcvr

PROMISC

RX-ALL

RX-FCS

Bypass NOW!

Bypass Power-UP

Bypass Power-DOWN

Bypass Disconnect

Advert Rates

- ☒ 10bt-HD
- ☒ 10bt-FD
- ☒ 100bt-HD
- ☒ 100bt-FD
- ☒ 1000-FD
- ☐ 10G-FD
- ☐ 40G-FD
- ☒ Flow-Control

Offload

- ☒ TSO Enabled
- ☐ UFO Enabled
- ☒ GSO Enabled
- ☐ LRO Enabled
- ☒ GRO Enabled

Print View Details Probe Sync Apply OK Cancel

A. Set the **IP Address**.

- B. In the **Port Manager** tab modify **eth3**.

- A. Set the **IP Address**.

2. Create a WanLink.

- A. In **Netsmith**, right click an open area and click **New Connection**.

- A. Select the Skip checkboxes on **Port 1-B** and **Port 2-B**.
 B. Set **Port 1-A** to **eth1**.
 C. Set **Port 2-A** to **eth2**.
 D. Click **OK**.
 E. Click **Apply** in Netsmith.

3. Configure the WanLink.

A. In the **WanLinks** tab, modify the WanLink.

The screenshot shows the 'VRWL-1.1.000 - Create/Modify WanLink' dialog box. It is divided into several sections:

- Section 1: WanLink Information**
 - Name: VRWL-1.1.000
 - Presets: CUSTOM
 - Port: 3 (eth2) for Endpoint A, 2 (eth1) for Endpoint B
 - Transfer Rate: 10M (10 Mbps) for both endpoints
 - Delay: zero (0 us) for both endpoints
 - Drop-Freq: zero (0%) for both endpoints
 - Jitter: zero (0 us) for both endpoints
 - Jitter-Freq: zero (0%) for both endpoints
- Section 2: WanLink Information**
 - Pass-Through: ☐
 - Coupled-Mode: ☐
 - HW Pass-Through: ☐
 - Kernel-Mode: ☒
 - Resource: 1 (brent-6port)
 - Rpt Timer: default (5 s)
 - Reorder-Freq: zero (0%) for both endpoints
 - Dup-Freq: zero (0%) for both endpoints
 - Drop Burst: min 1, max 1 for both endpoints
 - Reorder Amt: min 1, max 20 for both endpoints
- Section 3: Endpoint A WAN Paths and Endpoint B WAN Paths**
 - Endpoint A WAN Paths: Table with columns Name, Tx Rate, Disabled, Filter Pattern, Delay.
 - Endpoint B WAN Paths: Table with columns Name, Tx Rate, Disabled, Filter Pattern, Delay.
- Section 4: WanLink Information**
 - CPU-ID: 0
 - Test Manager: default_tm
 - Replay File: Dir for both endpoints
 - Dump File: for both endpoints
 - Loop Replay: ☒ for both endpoints
 - ICEcap Replay: ☐ for both endpoints
 - Force Packet Gap: ☐ for both endpoints
 - Drop-Xth: ☐ for both endpoints
 - Reorder-Xth: ☐ for both endpoints

A. Set the Transfer Rate to **10Mbps** for **both** endpoints.

- B. Click the **Script** button on **Endpoint A**.

Add/Modify Script

Endpoint Name: VRWL-1.1.000-A Script Type: ScriptWL

Script Name: my-script Group Action: All

☒ Enable Script ☒ Show Reports ☐ Symmetric ☒ Loop ☐ Hide Iteration Details ☐ Hide Legend ☐ Hide CSV

Loop Count: Forever Script Iterations: 10 (0) Estimated Duration: 10 s (0 ms)

Script Configuration

Run Duration: 1 s (1 s)

Rates: 10Mbps

Latencies: 0,0,0,0,0,0,0,0,1000

Jitter: 0

Drops: 0

Show Previous Report Sync Apply OK Cancel

- A. Set the **Script Type** to **ScriptWL**.
- B. Click the **Loop** checkbox.
- C. **Run Duration = 1s**
- D. **Rates = 10Mbps**
- E. **Latencies = 0,0,0,0,0,0,0,0,1000**
- F. **Jitter = 0**
- G. **Drops = 0**
- H. Click **OK**.

- C. Click **OK** to close the WanLink modify window.

4. Create a Layer 3 connection.

A. In the **Layer-3** tab, Click **Create**.

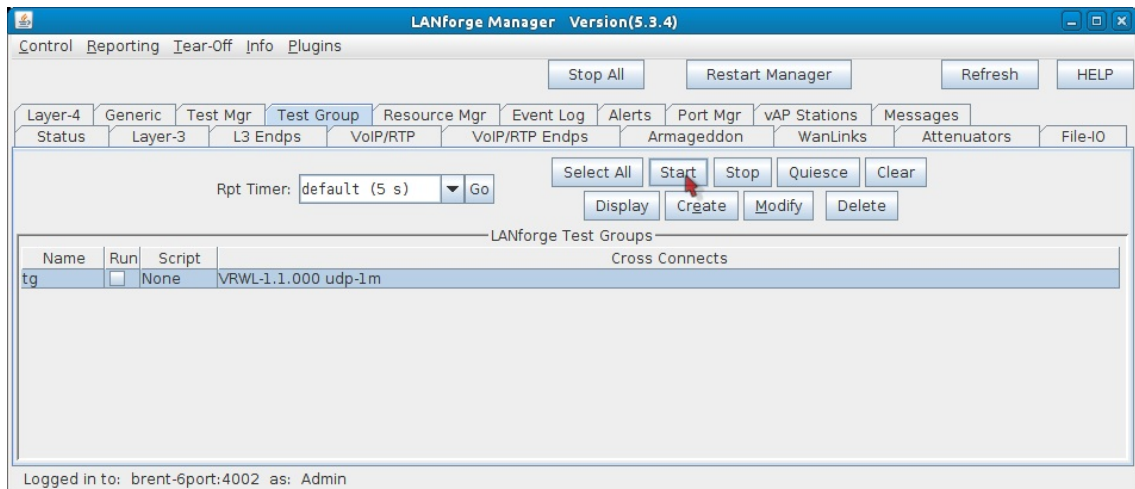
- A. CX Name = udp-1m
- B. Report Timer = 1s
- C. Endpoint A Port = eth0
- D. Endpoint B Port = eth3
- E. Endpoint A and B = 1m
- F. Endpoint A and B Min PDU Size = 64 B
- G. Click **OK**.

5. Create a test group to start the layer 3 connection and WanLink at the same time.

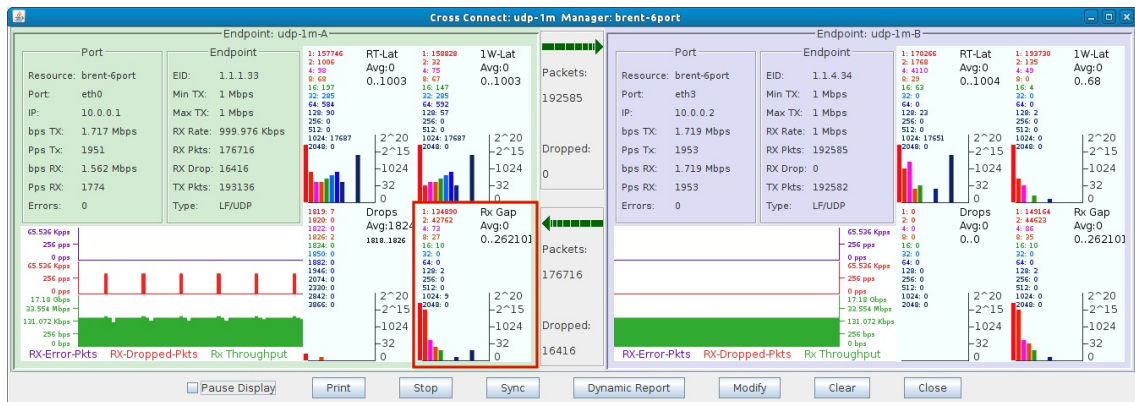
A. In the **Test Group** tab, click **Create**.

- A. **Test Group Name** = tg
- B. Select the WanLink and Layer 3 connection on the right and click **Add Cx**.
- C. Click **OK**.

6. Start the test group. This will start both the layer 3 connection and the scripted WanLink.
 - A. In the **Test Group** tab, select **tg** and click **Start**. You will see the Script Report window appear.



7. Display the Layer 3 connection and analyze the Rx Gap (sequence gap).
 - A. In the Layer-3 tab, select **udp-1m** and click **Display**.



- B. The **Rx Gap** graph is highlighted in the below screenshot. The Rx Gap for Endpoint B doesn't show one second sequence gaps because that side of the WanLink was not scripted.



- A. The colored numbers on the left side of the colon represent time in milliseconds. The right colored numbers represent the number of times a sequence gap reached the particular time on the left side.

You'll notice that 9 sequence gaps hit 1024ms. These gaps were the result of the WanLink script occasionally sending one second latency.