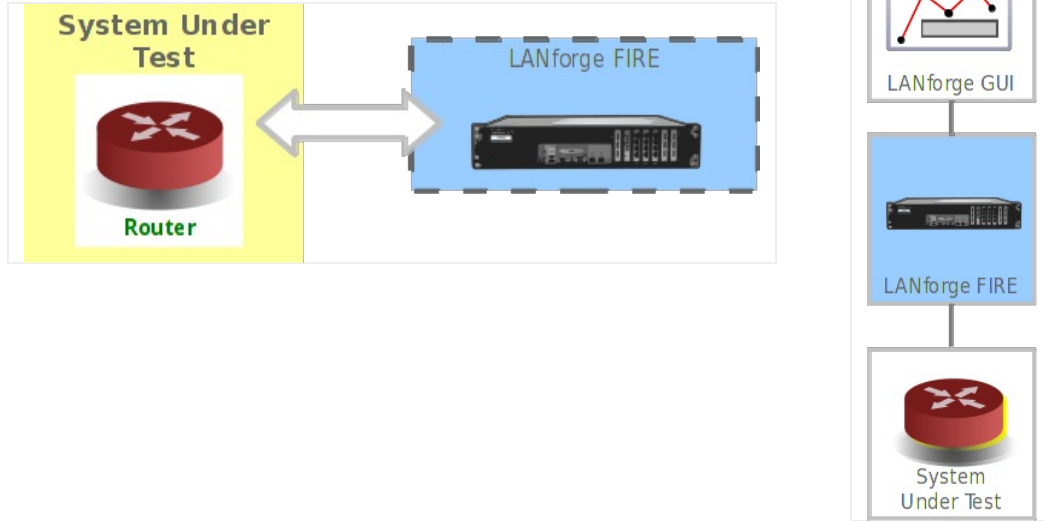


Generating Traffic to a Routed Network

Goal: Set up and run traffic on a routed network.

In this test scenario, LANforge-FIRE is used to generate traffic to a basic router in order to test throughput.



1. Connect one LANforge-FIRE port to the router's LAN port.
2. Connect another LANforge-FIRE port to the router's WAN port.
3. Set up the LANforge ports so that they have valid IP addresses. You can also use DHCP if the DUT supports it.
 - A. Go to the Port Manager

LANforge Manager Version(5.2.10)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

File-IO Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators Collision-Domains

Disp: 192.168.100.27:0.0 Sniff Packets Clear Counters Reset Port Delete

Rpt Timer: medium (8 s) Apply View Details Create Modify Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Pha...	Down	IP	SEC	Alias	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX	bps TX
1.1.0			192.168.100.129	0	eth2	189,810	2,121	3	2,984	144,274	276	1	8,932
1.1.1			0.0.0.0	0	eth1	15,192	67	0	0	21,382	145	0	0
1.1.2			0.0.0.0	0	eth3	9,594	31	0	0	13,259	67	0	0
1.1.3			0.0.0.0	0	eth4	9,094	31	0	0	15,137	73	0	0

Logged in to: 192.168.100.129:4002 as: Admin

B. Modify port for Endpoint A (eth3). Set a valid network IP Address and Gateway IP.

The screenshot shows the 'eth3 (ubuntu) Configure Settings' window. At the top, it displays 'Port Status Information' with the current status 'LINK-UP 1000bt-FD AUTO-NEGOTIATE Flow-Control TSO GSO GRO' and driver info 'Driver Info: Port Type: Ethernet Driver: e1000(7.3.21-k8-NAPI) Bus: 0000:00:0a.0'. Below this is the 'Port Configurables' section, which is divided into several panels:

- Enable:** A list of checkboxes for various settings: Set IP Info (checked), Set IP6 Info (checked), Set IF Down, Set MAC, Set TX Q Len, Set Offload, Set Rate Info, Set PROMISC, Set Rx-All/FCS, Set Bypass, Set Bridge Info, and Set CPU Mask.
- Services:** Checkboxes for HTTP and FTP.
- General Interface Settings:** A central panel with fields for DHCP-IPv6, DHCP-IPv4, Secondary-IPs, DNS Servers (BLANK), IP Address (192.168.2.102), IP Mask (255.255.255.0), Gateway IP (192.168.2.1), Alias, MAC Addr (08:00:27:25:65:63), Br Cost (Ignore), Rpt Timer (medium (8 s)), CPU Mask (NO-SET), DHCP Release (checked), Down, Aux-Mgt, DHCP Client ID (None), Peer IP (NA), Global IPv6 (AUTO), Link IPv6 (AUTO), IPv6 GW (AUTO), MTU (1500), TX Q Len (1000), Priority (Ignore), Watchdog (0), and WiFi Bridge (NONE).
- Port Rates:** Radio buttons for 10bt-HD, 10bt-FD, 100bt-HD, 100bt-FD, 1000-FD, 10G-FD, and Autonegotiate (selected). Other options include Renegotiate, Restart Xcvt, PROMISC, RX-ALL, RX-FCS, Bypass NOW!, Bypass Power-UP, Bypass Power-DOWN, and Bypass Disconnect.
- Advertise Ra...:** Checkboxes for 10bt-HD, 10bt-FD, 100bt-HD, 100bt-FD, 1000-FD, 10G-FD, and Flow-Control (checked).
- Offload:** Checkboxes for TSO Enabled, UFO Enabled, GSO Enabled, LRO Enabled, and GRO Enabled.

At the bottom of the window, there are buttons for 'Print', 'View Details', 'Probe', 'Sync', 'Apply', 'OK', and 'Cancel'.

C. Modify port for Endpoint B (eth4). Set a valid network IP Address and Gateway IP.

eth4 (ubuntu) Configure Settings

Port Status Information
 Current: LINK-UP 1000bt-FD AUTO-NEGOTIATE Flow-Control TSO GSO GRO
 Driver Info: Port Type: Ethernet Driver: e1000(7.3.21-k8-NAPI) Bus: 0000:00:09.0

Port Configurables

Enable

- Set IP Info
- Set IP6 Info
- 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

General Interface Settings

- DHCP-IPv6 DHCP Release Down Aux-Mgt
- DHCP-IPv4 **Secondary-IPs** DHCP Client ID: None
- DNS Servers: BLANK Peer IP: NA
- IP Address: 172.16.1.103 Global IPv6: AUTO
- IP Mask: 255.255.255.0 Link IPv6: AUTO
- Gateway IP: 172.16.1.1 IPv6 GW: AUTO
- Alias: MTU: 1500
- MAC Addr: 08:00:27:ae:e4:72 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
- Autonegotiate

Advertise Ra...

- 10bt-HD
- 10bt-FD
- 100bt-HD
- 100bt-FD
- 1000-FD
- 10G-FD
- Flow-Control

Offload

- TSO Enabled
- UFO Enabled
- GSO Enabled
- LRO Enabled
- GRO Enabled

Buttons: Print View Details Probe Sync Apply OK Cancel

D. Verify the port configuration

LANforge Manager Version(5.2.10)

Control Reporting Tear-Off Info Plugins

Buttons: Stop All Restart Manager Refresh HELP

File-IO Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators Collision-Domains

Disp: 192.168.100.27:0:0 Sniff Packets Clear Counters Reset Port Delete

Rpt Timer: medium (8 s) Apply View Details Create Modify Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

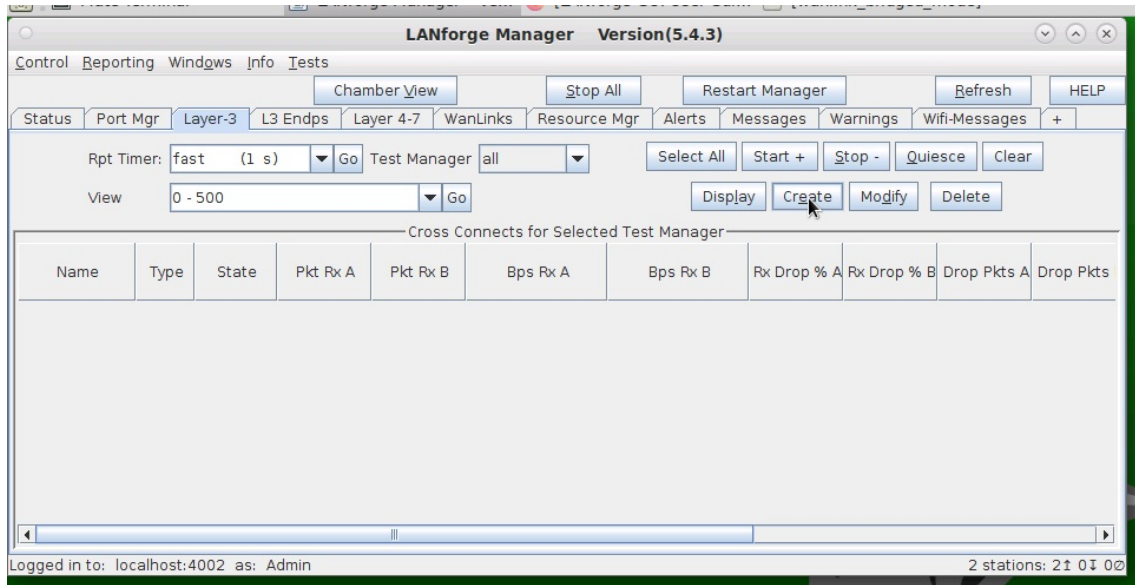
Port	Pha...	Down	IP	SEC	Alias	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX	bps TX	Collis
1.1.0			192.168.100.129	0	eth2	682,954	6,865	5	4,110	1,370,419	2,297	2	9,827	
1.1.1			0.0.0.0	0	eth1	15,192	67	0	0	21,382	145	0	0	
1.1.2			192.168.2.102	0	eth3	16,407	59	0	0	21,575	107	0	0	
1.1.3			172.16.1.103	0	eth4	13,085	46	0	0	22,648	110	0	0	

Logged in to: 192.168.100.129:4002 as: Admin

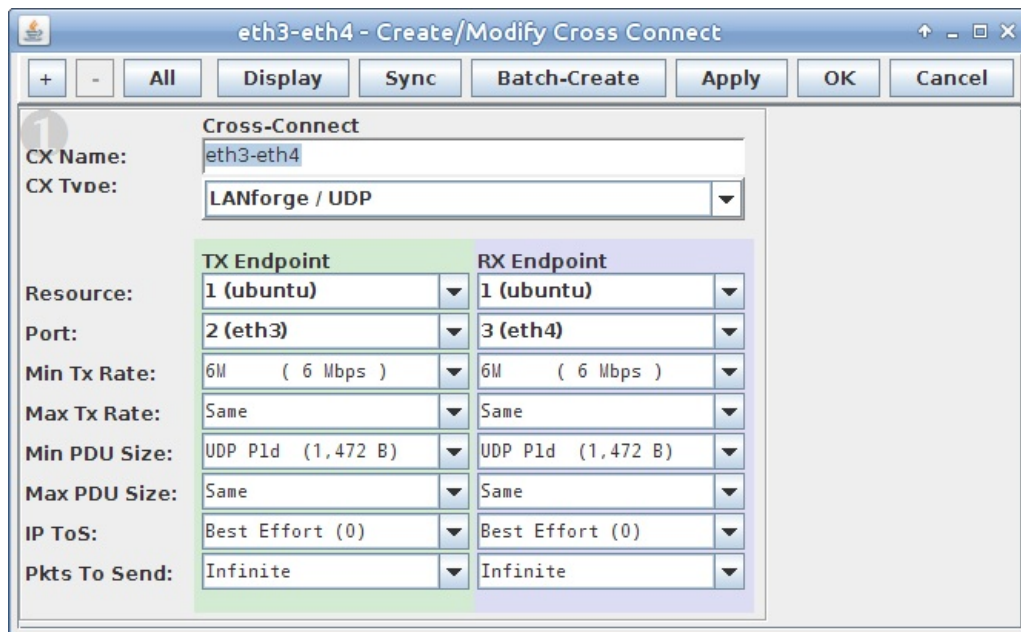
For more information see [LANforge User's Guide: Ports\(Interfaces\)](#)

4. Create a Layer-3 connection using the two configured ports.

A. Go to the **Layer-3** tab



B. Create a new Cross-Connect



C. Verify the new Cross-Connect

For more information see [LANforge User's Guid: Layer-3 Cross-Connects \(FIRE\)](#)

5. Run traffic and determine router throughput.

- A. Select the cross-connect on the **Layer-3** tab, click **Start** and then **Display**

LANforge Manager Version(5.2.10)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

File-IO Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators Collision-Domains

Rpt Timer: fast (1 s) Go Test Manager: all Select All Start Stop Quiesce Clear

View: 0 - 200 Display Create Modify Delete

Cross Connects for Selected Test Manager

Name	Type	State	Pkt Tx A->B	Pkt Tx A<-B	Rate A->B	Rate A<-B	Rx Drop ...	Rx Drop ...	Drop Pkt...	Drop Pkt...	Avg RTT	Rpt Timer
eth3-eth4	LF/UDP	Run	98	98	60,583	60,260	100	100	97	98	0	1000

Logged in to: 192.168.100.129:4002 as: Admin

- B. View the Layer-3 cross-connect display

Cross Connect: eth2-eth3 Manager: 192.168.100.129

Endpoint: eth2-eth3-A

Port: eth2 Resource: ubuntu EID: 1.1.2.5 Min TX: 6 Mbps Max TX: 6 Mbps bps TX: 1.192 Mbps RX Rate: 5.049 Mbps PPS Tx: 98 RX Pkts: 12058 bps RX: 1.141 Mbps RX Drop: 0 PPS RX: 94 TX Pkts: 13058 Errors: 0 Type: LF/UDP

Endpoint: eth2-eth3-B

Port: eth3 Resource: ubuntu EID: 1.1.3.6 Min TX: 6 Mbps Max TX: 6 Mbps bps TX: 1.146 Mbps RX Rate: 5.317 Mbps PPS Tx: 94 RX Pkts: 12649 bps RX: 1.198 Mbps RX Drop: 0 PPS RX: 100 TX Pkts: 12108 Errors: 0 Type: LF/UDP

RT-Lat Avg: 1.11394 Avg: 0.28 1W-Lat Avg: 0.20 Avg: 0.28

Pkts: 12649 Dropped: 0

Pkts: 12501 Dropped: 0

Pause Display Print Stop Sync Dynamic Report Modify Clear Close

For more information see [LANforge User's Guide: Layer-3 Cross-Connect Display](#)

6. For this example, a low performance router was used to illustrate poor throughput, variable latency, and dropped packets.

- A. Go to the **L3 Endps** tab

LANforge Manager Version(5.2.10)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Collision-Domains File-IO Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators

Min PDU Size: 1k (1,024 B) Go Max PDU Size: Same Go Start Stop Quiesce Clear

MIN Tx Rate: New Modem (56 Kbps) Go MAX Tx Rate: Same Go Display Create Modify Batch Modify Delete

All Endpoints

Name	EID	Run	Mng	Script	Tx Rate	Tx Rate(1)	Rx Rate	Rx Rate(1)	Rx Drop %	Tx Pkts	Rx Pkts	Delay	Dropped	Jitter	Tx Bytes	Rx Bytes
eth2-eth3-A	1.1.2.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None	5,290,694	0	5,067,477	0	0.01	30,789	29,490	0	0	0	045,321,408	43,409,280
eth2-eth3-B	1.1.3.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None	5,067,993	0	5,290,006	0	0.013	29,493	30,785	1	0	0	043,413,696	45,315,520

Logged in to: 192.168.100.129:4002 as: Admin

B. Scroll to the right to view Latency and Dropped Packets

LANforge Manager Version(5.2.10)

Control Reporting Tear-Off Info Plugins

Stop All Restart Manager Refresh HELP

Collision-Domains File-IO Layer-4 Generic Test Mgr Test Group Resource Mgr Event Log Alerts Port Mgr Messages

Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators

Min PDU Size 1k (1,024 B) Go Max PDU Size Same Go Start Stop Quiesce Clear

MIN Tx Rate New Modem (56 Kbps) Go MAX Tx Rate Same Go Display Create Modify Batch Modify Delete

View 0 - 400

All Endpoints

Pattern	Min PDU	Max PDU	Min Rate	Max Rate	Send-Buf	Rcv-Buf	CWND	TCP-MSS	Bursty	A/B	Elapsed	Destination Addr	Source Addr
0 INCREASING	1,472	1,472	6,000,000	6,000,000	0/64000	0/256000	0	0/0	<input type="checkbox"/>	A	68	172.16.1.103 33008	192.168.2.102 33007
0 INCREASING	1,472	1,472	6,000,000	6,000,000	0/64000	0/256000	0	0/0	<input type="checkbox"/>	B	68	192.168.2.102 33007	172.16.1.103 33008

Logged in to: 192.168.100.129:4002 as: Admin

For more information see [LANforge User's Guid: Layer-3 Endpoints \(FIRE\)](#)

Candela Technologies, Inc., 2417 Main Street, Suite 201, Ferndale, WA 98248, USA
 www.candelatech.com | sales@candelatech.com | +1.360.380.1618