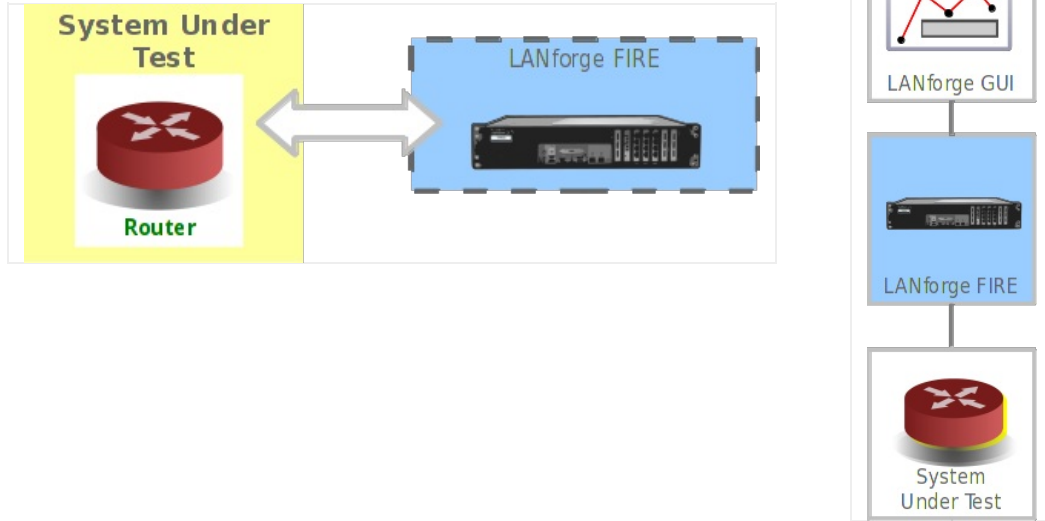


## Generating Traffic to a Routed Network

**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	<input type="checkbox"/>	<input type="checkbox"/>	192.168.100.129	0	eth2	189,810	2,121	3	2,984	144,274	276	1	8,932
1.1.1	<input type="checkbox"/>	<input type="checkbox"/>	0.0.0.0	0	eth1	15,192	67	0	0	21,382	145	0	0
1.1.2	<input type="checkbox"/>	<input type="checkbox"/>	0.0.0.0	0	eth3	9,594	31	0	0	13,259	67	0	0
1.1.3	<input type="checkbox"/>	<input type="checkbox"/>	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 'Port Type: Ethernet Driver: e1000(7.3.21-k8-NAPI) Bus: 0000:00:0a.0'. The main section is 'Port Configurables', which is divided into several panels:

- Enable:** A list of checkboxes for various settings, including 'Set IP Info', 'Set IP6 Info', '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'. There is also a 'Services' section with 'HTTP' and 'FTP' checkboxes.
- General Interface Settings:** A central panel with fields for 'DNS Servers' (BLANK), 'IP Address' (192.168.2.102), 'IP Mask' (255.255.255.0), 'Gateway IP' (192.168.2.1), 'MAC Addr' (08:00:27:25:65:63), 'Br Cost' (ignore), 'Rpt Timer' (medium (8 s)), 'CPU Mask' (NO-SET), 'DHCP-IPv6', 'DHCP Release', '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', '1000bt-HD', '1000bt-FD', '1000-FD', '10G-FD', and 'Autonegotiate'. There are also checkboxes for 'Renegotiate', 'Restart Xcvr', 'PROMISC', 'RX-ALL', 'RX-FCS', 'Bypass NOW!', 'Bypass Power-UP', 'Bypass Power-DOWN', and 'Bypass Disconnect'.
- Advertise Ra...:** Checkboxes for '10bt-HD', '10bt-FD', '1000bt-HD', '1000bt-FD', '1000-FD', '10G-FD', and 'Flow-Control'.
- 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.**

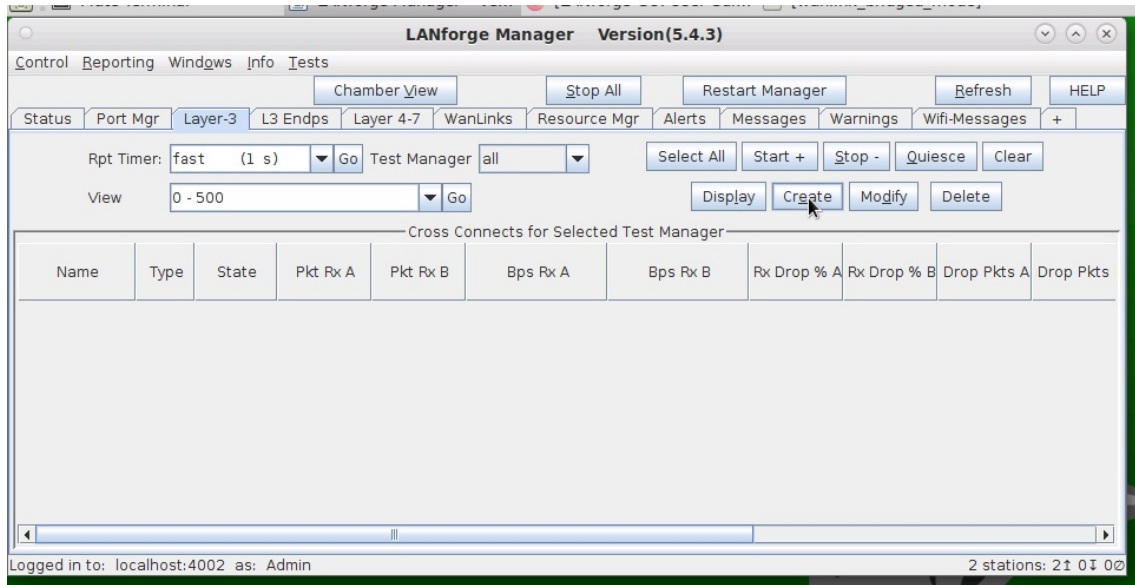
Port	Pha...	Down	IP	SEC	Alias	RX Bytes	RX Pkts	Pps RX	bps RX	TX Bytes	TX Pkts	Pps TX	bps TX	Collis
1.1.0			192.168.100.129	0	eth2	682,954	6,865	5	4,110	1,370,419	2,297	2	9,827	
1.1.1			0.0.0.0	0	eth1	15,192	67	0	0	21,382	145	0	0	
1.1.2			192.168.2.102	0	eth3	16,407	59	0	0	21,575	107	0	0	
1.1.3			172.16.1.103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

Logged in to: 192.168.100.129:4002 as: Admin

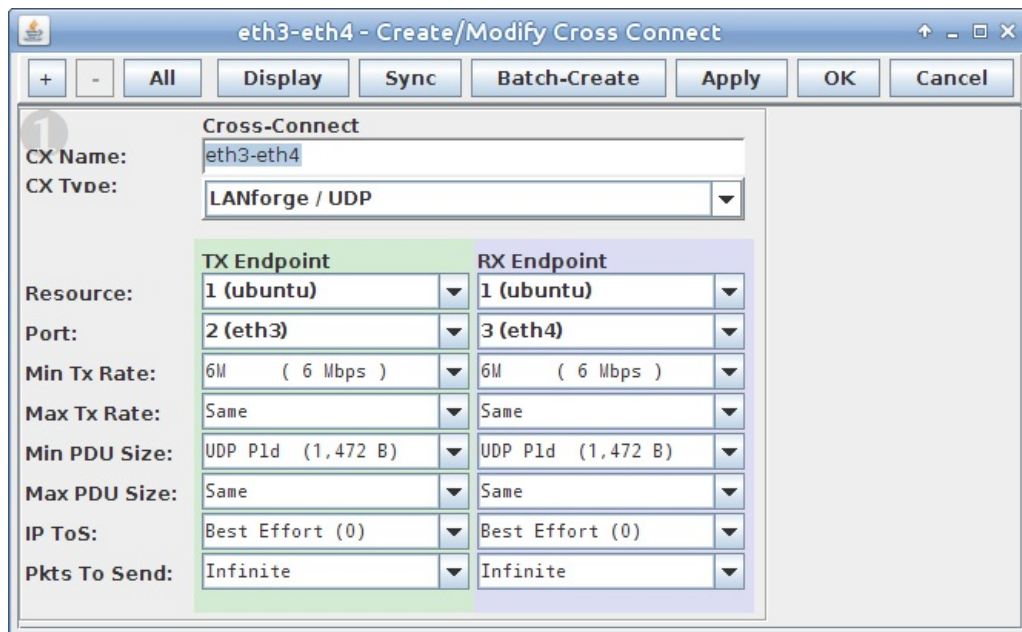
For more information see [LANforge User's Guide: Ports\(Interfaces\)](#)

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 Go 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  
IP: 192.168.2.102  
bps TX: 1.192 Mbps  
PPS Tx: 98  
bps RX: 1.141 Mbps  
PPS RX: 94  
Errors: 0

Endpoint: 1.1.2.5  
EID: eth2  
Min TX: 6 Mbps  
Max TX: 6 Mbps  
RX Rate: 5.049 Mbps  
RX Pkts: 12058  
TX Pkts: 13058  
Type: LF/UDP

RT-Lat: 1: 2020, Avg: 1: 11394  
1W-Lat: 2: 201, Avg: 0.20

Packets: 12649  
Dropped: 0

Endpoint: eth2-eth3-B

Port: eth3  
Resource: ubuntu  
IP: 172.16.1.103  
bps TX: 1.146 Mbps  
PPS Tx: 94  
bps RX: 1.198 Mbps  
PPS RX: 100  
Errors: 0

Endpoint: 1.1.3.6  
EID: eth3  
Min TX: 6 Mbps  
Max TX: 6 Mbps  
RX Rate: 5.317 Mbps  
RX Pkts: 12649  
TX Pkts: 12108  
Type: LF/UDP

RT-Lat: 1: 7761, Avg: 1: 2952  
1W-Lat: 2: 2002, Avg: 0.28

Packets: 12501  
Dropped: 0

Buttons: 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	45,321,408	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	43,413,696	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](http://www.candelatech.com) | [sales@candelatech.com](mailto:sales@candelatech.com) | +1.360.380.1618