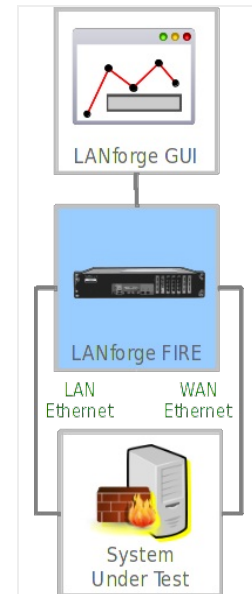
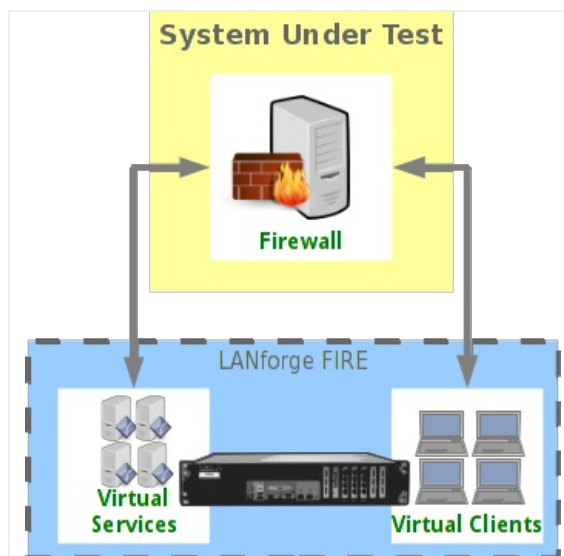


5000 concurrent TCP streams and IP addresses

Goal: Quickly set up 5000 TCP connections from 5000 different IP addresses.

Requires LANforge 5.2.10 or later. Use the new feature in 5.2.10 that lets 'multi-conn' Layer-3 TCP connections use a range of secondary IPs to quickly create 5000 stateful TCP/IP connections on different IP addresses. This example uses two 10G ports on a system similar to the LANforge CT503-MIX systems but the procedure should work on all properly licensed higher-end systems. A standard LANforge license only supports 1000 concurrent connections, contact your sales representative for additional licenses. This cookbook assumes basic familiarity with LANforge.



1. Create 5000 secondary IP addresses on an ethernet port. The IP address range should be on the same subnet as the primary IP address on this interface.

- A. Go to the Port Manager tab, select the client-side ethernet port and click Modify. Ensure subnet mask is 255.255.0.0 or similar so we have plenty of room to add the 5000 secondary IPs on the subnet. Apply if changes were made.

eth4 (If1005c-is14120020) Configure Settings

Port Status Information
 Current: LINK-UP 10G-FD TSO GSO GRO
 Driver Info: Port Type: Ethernet Driver: ixgbe(4.0.1-k) Bus: 0000:02:00.1 Cur: 5GT/s x8 Max: 5GT/s x8

Port Configurables

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: 192.168.99.30 Global IPv6: AUTO
- IP Mask: 255.255.0.0 Link IPv6: AUTO
- Gateway IP: 0.0.0.0 IPv6 GW: AUTO
- Alias: MTU: 1500
- MAC Addr: 00:e0:ed:2c:0b:87 TX Q Len: 1000
- Br Cost: ignore Priority: ignore
- Rpt Timer: faster (1 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

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

Bypass NOW!
 Bypass Power-UP
 Bypass Power-DOWN
 Bypass Disconnect

Buttons: Print View Details Probe Sync Apply OK Cancel

- B. Click the **Secondary-IPs** button to bring up the Secondary IP address management window. Enter the IP address range similar to the image below and click **Apply**:

Shelf: 1 Resource: 1 Port: 4 (If1005c-is14120020: eth4) Secondary-IPs

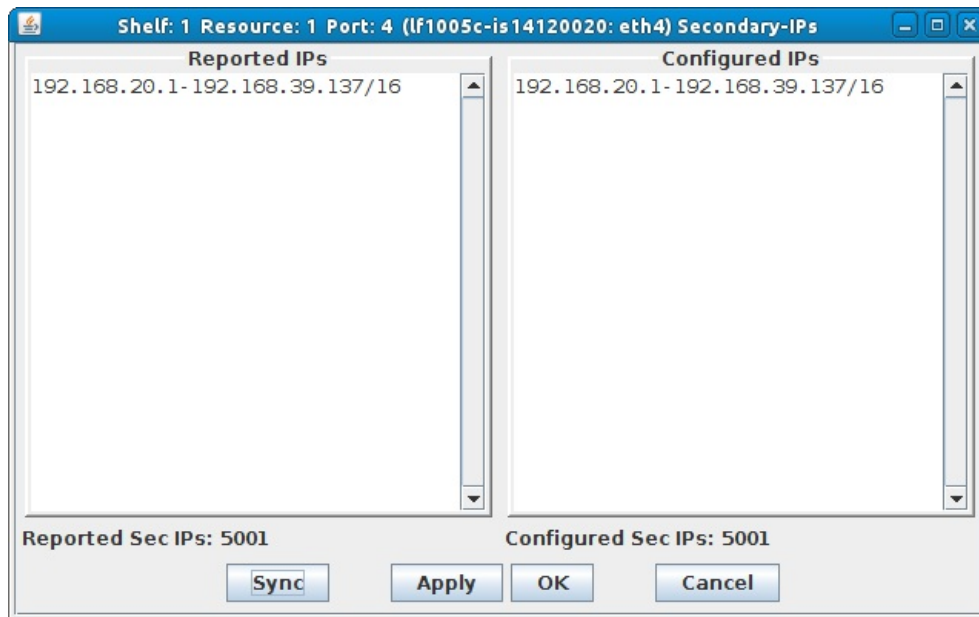
Reported IPs

Configured IPs
 192.168.20.1 - 192.168.39.250/16

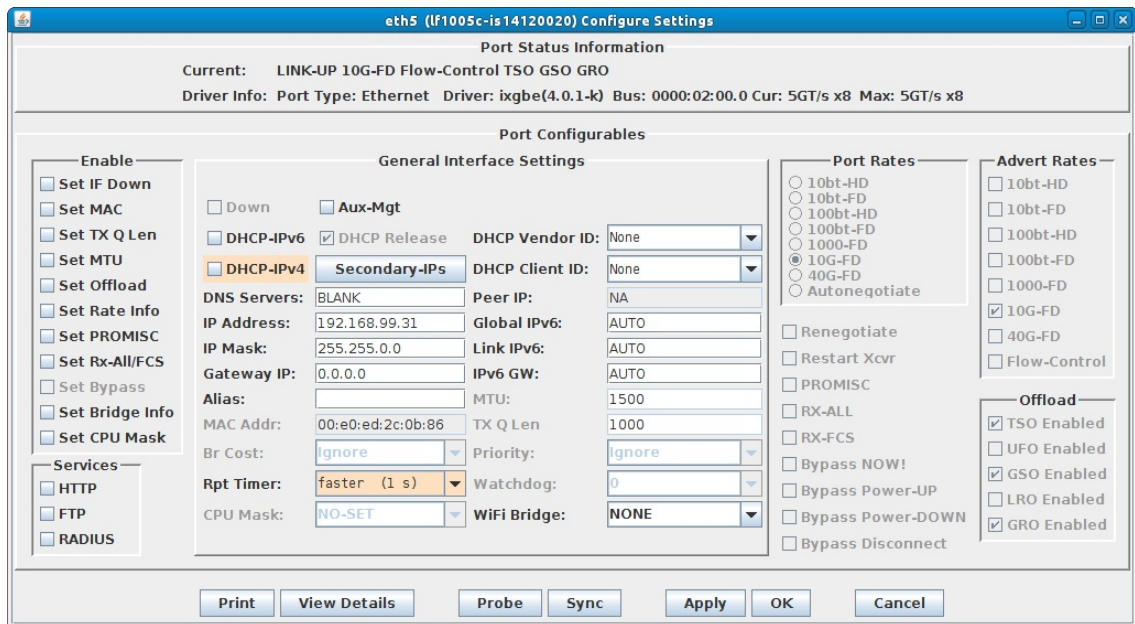
Reported Sec IPs: 0 **Configured Sec IPs: 0**

Buttons: Sync Apply OK Cancel

C. Click 'Sync' after a few minutes to make sure all of the new IP addresses were properly created.



D. Make sure a second ethernet port on the LANforge is properly configured for the server-side of the network. In this case, we are using a network-emulator in bridge mode as device-under-test, so all IP addresses are on the same subnet.



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

2. Create a Layer-3 TCP connection to utilize these 5000 secondary IPs and start the traffic.

- A. Go to the **Layer-3** tab and click Create. Configure the **CX Name**, **CX Type**, **Ports**, and **PDU Size** in section 1. The port in the green section should be the one with the secondary IP Addresses. In section 2, configure **Min IP Port** in the green section, and **Multi-Conn** in both. In section 3, select 'Linear' for the **IP Addr** selection box in the green section. In section 5, select the **Concurrent IP Addr** checkbox in the green section.

tcp-mcon-sec-ip - Create/Modify Cross Connect

Display Sync Batch-Create Apply OK Cancel

1 Cross-Connect

CX Name: tcp-mcon-sec-ip
 CX Type: LANforge / TCP

Endpoint A (Client)	Endpoint B (Server)
Resource: 1 (If1005c-is14120020)	1 (If1005c-is14120020)
Port: 4 (eth4)	5 (eth5)
Min Tx Rate: New Modem (56 Kbps)	New Modem (56 Kbps)
Max Tx Rate: Same	Same
Min PDU Size: 9000 (9,000 B)	9000 (9,000 B)
Max PDU Size: Same	Same
IP ToS: Best Effort (0)	Best Effort (0)
Pkts To Send: Infinite	Infinite

2 Cross-Connect

Report Timer: fast (1 s)

Endpoint A (Client)	Endpoint B (Server)
Pid Pattern: increasing	increasing
Min IP Port: Any (0)	AUTO
Max IP Port: Same	Same
Min Duration: Forever	Forever
Max Duration: Same	Same
Min Reconn: 0 (0 ms)	0 (0 ms)
Max Reconn: Same	Same
Multi-Conn: 5000 (5,000)	One (1)

Script Threshholds

3 Cross-Connect

Test Manager: default_tm
 Quiesce: 3 (3 sec)

Endpoint A (Client)	Endpoint B (Server)
IP Addr: Linear	AUTO
<input type="checkbox"/> Replay File	<input type="checkbox"/> Replay File
<input type="checkbox"/> Loop	<input type="checkbox"/> Loop
<input type="checkbox"/> Dest Mac	<input type="checkbox"/> Dest Mac
Filename:	
Dest MAC: 00:e0:ed:2c:0b:86	00:e0:ed:2c:0b:87

4 Cross-Connect

Endpoint A (Client)	Endpoint B (Server)
Snd Buff Size: OS Default	OS Default
Rcv Buff Size: OS Default	OS Default
Send Bad FCS: zero (0%)	zero (0%)
Src MAC: 00:e0:ed:2c:0b:87	00:e0:ed:2c:0b:86
<input type="checkbox"/> Use-Proxy	<input type="checkbox"/> Use-Proxy
Proxy Addr: 192.168.99.31	0.0.0.0
Proxy Port: 0	0
Socket Priority: 0	0

Payload Payload

5 Cross-Connect

Endpoint A (Client)	Endpoint B (Server)
Conn Timeout: 10s (10 s)	10s (10 s)
TCP MSS: OS Default	OS Default

Endpoint A (Client)	Endpoint B (Server)
<input type="checkbox"/> Do Checksum	<input type="checkbox"/> Do Checksum
<input type="checkbox"/> UnManaged	<input type="checkbox"/> UnManaged
<input type="checkbox"/> Duration Quiesce	<input type="checkbox"/> Duration Quiesce
<input type="checkbox"/> Quiesce-After-Range	<input type="checkbox"/> Quiesce-After-Range
<input type="checkbox"/> TCP_NODELAY	<input type="checkbox"/> TCP_NODELAY
<input checked="" type="checkbox"/> Concurrent IP Addr	<input type="checkbox"/> Concurrent IP Addr
<input type="checkbox"/> Clear-Port-On-Start	<input type="checkbox"/> Clear-Port-On-Start
<input type="checkbox"/> Linear-IP-Ports	<input type="checkbox"/> Linear-IP-Ports

Endp Name: tcp-mcon-sec-ip-A tcp-mcon-sec-ip-B

- B. Start the connection, and then go to the **Port Mgr** tab, select one of the ethernet ports, and sniff the traffic (or use third-party tools) to verify the IP address range is as expected:

The screenshot shows the Wireshark interface with the following details:

No.	Time	Source	Destination	Protocol	Length	Info
261527	25.534397000	192.168.99.31	192.168.33.222	LANforge	9066	Seq: 80
261528	25.534400000	192.168.35.145	192.168.99.31	TCP	66	42891 > 33001 [ACK] Seq=180001 Ack=180001 Win=175 Len=0 TSval=347053:...
261529	25.534406000	192.168.33.222	192.168.99.31	TCP	66	14769 > 33001 [ACK] Seq=180001 Ack=180001 Win=175 Len=0 TSval=347053:...
261530	25.534411000	192.168.99.31	192.168.35.153	LANforge	9066	Seq: 80
261531	25.540766000	192.168.99.31	192.168.24.150	LANforge	9066	Seq: 81
261532	25.540780000	192.168.24.150	192.168.99.31	TCP	66	49449 > 33001 [ACK] Seq=180001 Ack=180001 Win=175 Len=0 TSval=347053:...
261533	25.540783000	192.168.99.31	192.168.24.169	LANforge	9066	[TCP ACKed unseen segment] Seq: 81
261534	25.540789000	192.168.24.169	192.168.99.31	TCP	66	[TCP Previous segment not captured] 55075 > 33001 [ACK] Seq=180001 A...
261535	25.540790000	192.168.99.31	192.168.24.154	LANforge	9066	[TCP ACKed unseen segment] Seq: 81
261536	25.540791000	192.168.99.31	192.168.24.175	LANforge	4410	Seq: 81
261537	25.540793000	192.168.99.31	192.168.24.173	LANforge	9066	Seq: 81
261538	25.540841000	192.168.99.31	192.168.24.172	LANforge	7306	[TCP ACKed unseen segment] Seq: 81
261539	25.540844000	192.168.24.172	192.168.99.31	TCP	66	[TCP Previous segment not captured] 56654 > 33001 [ACK] Seq=180001 A...
261540	25.540852000	192.168.99.31	192.168.24.157	LANforge	9066	Seq: 81
261541	25.540855000	192.168.24.157	192.168.99.31	TCP	66	54088 > 33001 [ACK] Seq=180001 Ack=180001 Win=175 Len=0 TSval=347053:...
261542	25.540858000	192.168.99.31	192.168.24.181	LANforge	9066	Seq: 81
261543	25.540861000	192.168.24.181	192.168.99.31	TCP	66	[TCP ACKed unseen segment] 30859 > 33001 [ACK] Seq=171001 Ack=180001

Packet Details for Frame 1:

- Ethernet II, Src: Silicom_2c:0b:87 (00:e0:ed:2c:0b:87), Dst: Silicom_2c:0b:86 (00:e0:ed:2c:0b:86)
- Internet Protocol Version 4, Src: 192.168.38.55 (192.168.38.55), Dst: 192.168.99.31 (192.168.99.31)
- Transmission Control Protocol, Src Port: 24160 (24160), Dst Port: 33001 (33001), Seq: 1, Ack: 1, Len: 0

Packet Bytes:

```

0000  00 e0 ed 2c 0b 86 00 e0 ed 2c 0b 87 08 00 45 00  ....E.
0010  00 34 75 1f 40 00 40 06 ba fd c0 a8 26 37 c0 a8  .4u.@.@. ...67..
0020  63 1f 5e 60 89 c0 23 8c 03 c8 29 72 02 80 10  c.^...# ...}r...
0030  00 af 0a ce 00 00 01 01 08 0a 00 34 91 05 00 34  .....4...4
0040  91 04
  
```

File: *var/tmp/wireshark_pcapng_et... Packets: 261810 · Displayed: 261810 (100.0%) · Dropped: 198802 (75.9%) Profile: Default