

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 'multiconn' 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 (lf100	5c-is14120020) Co	nfigure 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		General Int	erface Settings			Port Rates	Advert Rates				
Set IF Down						O 10bt-HD	10bt-HD				
Set MAC	Down	Aux-Mgt				0 100t-FD 0 100bt-HD	10bt-FD				
Set TX Q Len	DHCP-IPv6	DHCP Release	DHCP Vendor ID:	None	-	0 100bt-FD	100bt-HD				
Set MTU		Secondary-IPs	DHCP Client ID:	None	-	• 10G-FD	100bt-FD				
Set Offload	DNS Somore:		Boor ID:	NA		O 40G-FD O Autonegotiate	1000-FD				
Set Rate Info	ID Address:	102 169 00 20	Global IDv6:		_		✓ 10G-FD				
Set PROMISC	IP Address:	255 255 0 0	Giobal IPvo:	AUTO	_	Renegotiate	40G-FD				
Set Rx-All/FCS	Cotoway ID:	233.233.0.0	IDue CW	AUTO	_	Restart Xcvr	Flow-Contr				
Set Bypass	Aliaci	0.0.0.0	MTU:	1500	_	PROMISC	Offload				
Set Bridge Info	Allas:	00.00.0d.20.0b.97	TY OLOD	1000		RX-ALL					
Set CPU Mask	MAC Addr:	00:e0:ed:20:00:87	TXQLen	1000	_	RX-FCS					
-Services	Br Cost:	Ignore	Priority:	Ignore	-	Bypass NOW!	GEO Enable				
🗌 НТТР	Rpt Timer:	faster (1 s) 🔻	Watchdog:	0	-	Bypass Power-UP					
FTP	CPU Mask:	NO-SET 💌	WiFi Bridge:	NONE	-	Bypass Power-DOWN					
RADIUS						Bypass Disconnect					
	Drint V	aw Dataila	Droho Supr	Annhu		OK Cancel					
	Print	ew Details	Probe Sync	Арріу		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 (lf10)	05c-is14120020: eth4) Secondary-IPs	
Reported IPs	Configured IPs	1
	192.168.20.1-192.168.39.250/16	
Reported Sec IPs: 0	Configured Sec IPs: 0	
Sync App	oly OK Cancel	

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

📓 Shelf: 1 Resource: 1 Port: 4 (l	f1005c-i	s14120020: eth4) Secondary-IPs	- • ×
Reported IPs	1	Configured IPs	1
192.168.20.1-192.168.39.137/16		192.168.20.1-192.168.39.137/16	
Reported Sec IPs: 5001		Configured Sec IPs: 5001	
Sync	Apply	OK Cancel	

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.

eth5 (lf1005c-is14120020) Configure Settings											
Port Status Information											
	Current: LINK-UP 10G-FD Flow-Control TSO GSO GRO										
Driver Info: Port Type: Ethernet Driver: ixgbe(4.0.1-k) Bus: 0000:02:00.0 Cur: 5GT/s x8 Max: 5GT/s x8											
Port Configurables											
Enable —	-	General In	terface Settings			Port Rates	Advert Rates -				
Set IF Down						O 10bt-HD	Dibt-HD				
Set MAC	Down	Aux-Mgt				O 100t-FD	10bt-FD				
Set TX Q Len	DHCP-IPv6	DHCP Release	DHCP Vendor ID:	None	-	0 100bt-FD	100bt-HD				
Set MTU		Secondary-IPs	DHCP Client ID:	None	Ţ	© 10G-FD	100bt-FD				
Set Offload	DNE Express		Boor ID:	ALA.		O 40G-FD O Autonegotiate	1000-FD				
Set Rate Info	ID Addross:	1021690021	Clobal IDuc			Renegotiate	10G-FD				
Set PROMISC	ID Mack	255 255 0 0	Link IDv6	AUTO			40G-FD				
Set Rx-All/FCS	Cotoway ID:	233.233.0.0	LINK IPVO.	AUTO	=	Restart Xcvr	Flow-Control				
Set Bypass	dateway IP.	0.0.0.0	MTU.	1500		PROMISC	official				
Set Bridge Info	Allds:	00 -0 -d 2- 0h 06	TY OLER	1000		RX-ALL	United International				
Set CPU Mask	MAC Addr:	00:e0:ed:20:00:86	TXQLen	1000		RX-FCS					
-Services-	Br Cost:	Ignore	Priority:	Ignore		Bypass NOW!					
HTTP	Rpt Timer:	faster (1 s) 🔻	Watchdog:	0	-	Bypass Power-UP					
FTP	CPU Mask:	NO-SET 💌	WiFi Bridge:	NONE	-	Bypass Power-DOWN					
RADIUS						Bypass Disconnect	Give Enabled				
1					_] =					
	Drint	aw Dataila	Droho Curr	Areli		OK Cancel					
	Print Vi	ew Details	Probe Sync	Apply		OK Cancel					

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 Addrs checkbox in the green section.

*			tcp-mcon-sec-ip - C	real	e/Modify Cross	Conn	ect				
+ - All					Display	Syne	Batch-Create	1	Apply	ОК	Cancel
CX Name: CX Type:	Cross-Connect tcp-mcon-sec-ip				Report Tim	ner:	Cross-Connect fast (1 s) ▼				
	Endpoint A (Client)	_	Endpoint B (Server)	-			Endpoint A (Client)	Endpoint B (Server)			
Resource:	1 (lf1005c-is14120020)	-	1 (lf1005c-is14120020)	-	Pid Patter	n	Increasing		Increa	sing	
Port:	4 (eth4)	-	5 (eth5)	-	Min IP Port		Any (0)		Como		
Min Tx Rate:	New Modem (56 Kbps)	-	New Modem (56 Kbps)	-	Max IP Por	L:	Forever		Forever	-	
Max Tx Rate:	Same	-	Same	-	Max Durati	ion:	Same	- -	Samo	<u> </u>	
Min PDU Size:	9000 (9,000 B)	-	9000 (9,000 B)	-	Max Durat	ion:) mc)	
Max PDU Size:	Same	-	Same	-	Max Baca		Same		Same	,	
IP ToS:	Best Effort (0)	-	Best Effort (0)	-	Multi Com		5000 (5.000)		One (1)	1	
Pkts To Send:	Infinite	-	Infinite	-	Multi-Conr	1:	Script		Script		
							Throcholdo		Throsholds		
							mesholds			in conoic	
2	Cross-Connect				Δ		Endpoint A (Client)		Endpoi	nt B (Ser	ver)
Test Manager	default_tm			-	Snd Buff S	ize:	OS Default	•	OS Defa	ault	-
Quiesce:	3 (3 sec)			•	Rcv Buff Si	ze:	OS Default	•	OS Defa	ault	-
	Endpoint A (Client)	_	Endpoint B (Server)		Send Bad	FCS:	zero (0%)	-	zero ((98)	-
IP Addr:	Linear	-	AUTO	•	Src MAC:		00:e0:ed:2c:0b:87	-	00:e0:	ed:2c:0b:8	16 🔻
	Replay File		Replay File				Use-Proxy		Use-	Ргоху	
	Loop		Loop		Proxy Add	r	192.168.99.31	_	0.0.0.0		
Filename	Dest Mac		Dest Mac		Proxy Port	:	0		0		
Doct MAC:	00:e0:ed:2c:0b:86	-	00:e0:ed:2c:0b:87		Socket Pri	ority	0		0		
Dest MAC.	00.00.00120.00100		00.00.00120.00107				Payload			Payload	
	Endnaint A (Cliant)		Endnaint D. (Canvar)				inducint A (Client)		ndnoini		o.r.)
5	Endpoint A (Chent)		Endpoint B (Server)				Do Checksum		Do Ch	ecksum	51)
Conn Timeout:	10s (10 s)	-	10s (10 s)	-					UnMa	naged	
TCP MSS:	OS Default	-	OS Default	•			Duration Quiesce		Durati	ion Quiese	be
							Quiesce-After-Range		Quies	ce-After-R	ange
							TCP_NODELAY		TCP_N	ODELAY	
							Concurrent IP Addrs	L		Port-Op 6	tart
							Linear-IP-Ports		Linea	-IP-Ports	cart
					Endp Name:	t	cp-mcon-sec-ip-A	t	cp-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:

🗋 💦 *eth4 [Wireshark 1.10.14 (Git Rev Unknown from unknown)] (on lf1005c-is14120020)									
<u>File E</u> dit <u>V</u> iew <u>G</u> o <u>C</u> apture <u>A</u> nalyze <u>S</u> tatistics Telephony <u>T</u> ools <u>I</u> r	nternals <u>H</u> elp								
🖲 💿 🚄 🗏 🛃 🖪 🔚 🗶 G 🔍 🤄 🗞	- 🛪 🖄 🗐 🕞 👌 = 11 📅 👹 🖬 🐯 🐻 🙄								
Filter: Expression Clear Apply Save									
No. Time Source Destination	Protocol Length Info								
261527 25.53439700(192.168.99.31 192.168.33.222	LANforg∈ 9066 Seq: 80								
261528 25.53440000(192.168.35.145 192.168.99.31	TCP 66 42891 > 33001 [ACK] Seq=180001 Ack=180001 Win=175 Len=0	TSval=347053:							
261529 25.534400000 192.108.55.222 192.108.99.51	LANForge 9066 Seg: 80	15vat-34/035.							
261531 25.54076600(192.168.99.31 192.168.24.150	LANforge 9066 Seq: 81								
261532 25.54078000/192.168.24.150 192.168.99.31	TCP 66 49449 > 33001 [ACK] Seq=180001 Ack=180001 Win=175 Len=0	TSval=347053;							
261533 25.54078300(192.168.99.31 192.168.24.169	LANforg∈ 9066 [TCP ACKed unseen segment] Seq: 81								
261534 25.54078900(192.168.24.169 192.168.99.31	TCP 66 [TCP Previous segment not captured] 55075 > 33001 [ACK]	Seq=180001 Ac							
261535 25.54079000(192.168.99.31 192.168.24.154	LANforg: 9066 [TCP ACKed unseen segment] Seq: 81								
261536 25.54079100(192.168.99.31 192.168.24.175	LANforge 4410 Seq: 81								
261537 25.54079300 192.168.99.31 192.168.24.173	LANTORGE 3000 Seq: 81								
261539 25.54084400(192.168.24.172 192.168.99.31	TCP 66 [TCP Previous segment not captured] 56654 > 33001 [ACK]	Seg=180001 Ac							
261540 25.54085200(192.168.99.31 192.168.24.157	LANforg∉ 9066 Seq: 81								
261541 25.54085500(192.168.24.157 192.168.99.31	TCP 66 54088 > 33001 [ACK] Seq=180001 Ack=180001 Win=175 Len=0	TSval=347053;							
261542 25.54085800(192.168.99.31 192.168.24.181	LANforg∉ 9066 Seq: 81								
261543 25.54086100(192.168.24.181 192.168.99.31	TCP 66 [TCP ACKed unseen segment] 30859 > 33001 [ACK] Seq=17100	1 Ack=180001 🕞							
▷ Frame 1: 66 bytes on wire (528 bits), 66 bytes captured (5	28 bits) on interface O								
Ethernet II, Src: Silicom_2c:0b:87 (00:e0:ed:2c:0b:87), Ds	t: Silicom_2c:0b:86 (00:e0:ed:2c:0b:86)								
P Internet Protocol Version 4, Src: 192.168.38.55 (192.168.3 Transmission Control Destage) See Dart: 24160 (24160) Destage	8.55), DST: 192.168.99.31 (192.168.99.31)								
TV Transmission control Protocol, Sic Port. 24100 (24100), DS	(POIL. 33001 (33001), Seq. 1, ACK. 1, Len. 0								
0000 00 e0 ed 2c 0b 86 00 e0 ed 2c 0b 87 08 00 45 00	,E.	16							
0010 00 34 75 1f 40 00 40 06 ba fd c0 a8 26 37 c0 a8 .4u	.@.@&7								
0020 63 11 5e 60 80 e9 c0 23 8c 03 c8 29 72 02 80 10 c.^	·#)r Δ Δ								
0040 91 04									
⊖ 💆 File: "/var/tmp/wireshark_pcapng_et Packets: 261810 · Displayed:	261810 (100.0%) · Dropped: 198802 (75.9%) Profile: Default								

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