

## Scripted Layer-3 Test

**Goal**: Use RFC-2544 as a guide to create a Layer-3 connection that can run automatically through various payload sizes and rates for a specified duration.

In this example, LANforge is used to set up a scripted connection that will iterate through a user-defined list of payload sizes and transmission rates. Each iteration will run for a user-defined duration with a user-defined pause between iterations. A summary text report is generated at the conclusion of all iterations.

- 1. Create a Layer-3 connection. For more information see Generating Traffic to a Switched Network
- 2. Modify the Layer-3 connection to add the script.
  - A. Highlight the Layer-3 connection and select **Modify**.

scr-test-1 - Create/Modify Cross Connect											
+ - All					Display Syno	Display Sync Batch-Create Apply OK					
CX Name: CX Type:	Cross-Connect scr-test-1 LANforge / UDP				Report Timer:	Report Timer: Cross-Connect fast (1 s) Endpoint A Endpoint B					
Resource:	Endpoint A 1 (fwa710-blue)	Idpoint A Endpoint B (fwa710-blue) ▼ 1 (fwa710-blue) ▼				increasing	•	increasing -			
Port:	3 (eth3)	-	4 (eth4) 🗸	-	Min IP Port: Max IP Port:	Same	•	AUTO V			
Min Tx Rate: Max Tx Rate:	New Modem (56 Kbps) Same	•	New Modem (56 Kbps)	· •]	Min Duration:	Forever	•	Forever  Same			
Min PDU Size:	AUTO	•	AUTO	-	Min Reconn:	0 (0 ms)	•	0 (0 ms) 👻			
IP ToS:	Best Effort (0)	•	Best Effort (0)	-	Max Reconn: Multi-Conn:	Same Normal (0)	•	Same 💌 Normal (0) 👻			
Pkts To Send:	Infinite	•	Infinite	·		Script		Script			
						Thresholds		Thresholds			

B. Select the Script button on Endpoint A.

<u></u>		Add/Modify Scrip	1								
Endpoint Name:	scr-test-1-A	Script Type:	NONE	<b>~</b>							
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:	NA	Estimated Duration: NA							
Script Configuration											
	Show Previous Report Sync Apply OK Cancel										

C. Select the Script Type, RFC-2544.

<u>\$</u>	Add/A	Aodify Script							
Endpoint Name: scr-test-1-	-A Script Type:	RFC-2544 💌							
Script Name: my-script	Group Action:	All							
🗹 Enable Script 🛛 Show F	Reports 🗌 Symmetric 🔲	Loop 🗌 Hide Iteration Details	🗌 Hide Legend 🗌 Hide CSV						
Loop Count Forever	Script Iteratio	ons: 27 (27) Estin	nated Duration: 15.75 m (15.75 m)						
Script Configuration									
Show Dups Show (	000 Show Attenuation	n 🔲 Hide Latency Distributions	Hide Constraints						
Run Duration:	30 s (30 s)	▼ Pause Duration:	5 s (5 s) 💌						
Max Drop Percent:	5% (5%)	▼ Max-Tx-Underrun:	10% (10%)						
Max Jitter:	high (100 ms)	▼ Max RT Latency:	500ms (500 ms) 💌						
Max Failed OK:	0	•							
Rates A	Rates B Pa 35 Mbps 00Mbps Gbps 128 128 128 128 128 128 128 128	Ayload Sizes A Payload Sizes 256 256 512 1024 1280 1460 1460 1472 1514	Attenuations (ddB)           NONE           100           300           400           600           955						
Show Pro	evious Report Syn	c Apply OK	Cancel						

A. Note: A default set of payload sizes are set up based on RFC-2544 but, can be changed by typing over the default values.

B. Note: For Layer-3 UDP and TCP connections, 'payload size' refers to size of the payload being carried by the protocol and not the ethernet frame size.

- 3. Set up script options. For details refer to: LANforge User's Guide: Scripted Cross Connect
  - A. Select **Symmetric** for the script to run both endpoints for a bi-directional traffic test.

<b>\$</b>			Add/Mo	dify Script			_ <b>•</b> ×		
Endpoint Name:	scr-test-1-A	•	Script Type:	RFC-2544	-				
Script Name:	my-script		Group Action:	All	*				
Enable Script	Show Re	ports 🗹 Sy	ymmetric 🗌 Lo	op 🗌 Hide Itera	ation Details	Hide Legend	Hide CSV		
Loop Count	Forever		Script Iteration	s: 27 (27)	Estin	nated Duration: 15.	75 m (15.75 m)		
Script Configuration									
Show Dups Show 000 Show Attenuation Hide Latency Distributions Hide Constraints									
Run Duration:		30 s (3	0 s)	Pause Durat	tion:	5s (5s)	•		
Max Drop Perce	nt:	5% (5%)		Max-Tx-Und	errun:	10% (10%)			
Max Jitter:		high (100 m	ms)	Max RT Late	ncy:	500ms (500 ms)			
Max Failed OK:		0		-					
Rates A	bps 10M 100M 16bp	Rates B	Pay 60 128 256 512 1024 1280 1460 1460 1472 1514	oad Sizes A—	Payload Siz	es B Attenuat NONE	ions (ddB)-		
	Show Prev	ious Report	Sync	Appl	у ОК	Cancel			

B. Set the Run and Pause Duration.

<u>ی</u>			Add/Mod	lify Script			_ • ×			
Endpoint Name:	scr-test-1-A	-	Script Type:	RFC-2544	-					
Script Name:	my-script		Group Action:	All	-					
Enable Script	Show Rep	ports 🗹 Sy	ymmetric 📃 Loo	op 🗌 Hide Ite	eration Details	Hide Legend 🗌 Hid	le CSV			
Loop Count	Forever	-	Script Iteration	s: 27 (27)	Est	timated Duration: 2.7	7 m (2.7 m)			
	Script Configuration									
Show Dups	Show 00	0 Show	w Attenuation	🗌 Hide Laten	c <mark>y</mark> Distributions	Hide Constraints				
Run Duration:		5 s (5	s)	Pause Du	ration:	ls (ls)	-			
Max Drop Perce	nt:	5% (5%)		Max-Tx-Un	derrun:	10% (10%)	-			
Max Jitter:		high (100 m	ms)	Max RT La	tency:	500ms (500 ms)	-			
Max Failed OK:		0		-						
Rates A	·	-Rates B	Payle	oad Sizes A—	Payload Size	es B — <mark>Attenuation</mark>	s (ddB) —			
bps 100Mbps 100Mbps 1Gbps	bps 10Mb 100M 16bp	ps bps s	60 128 256 512 1024 1280 1460 1472 1514		60 128 256 512 1024 1280 1460 1472 1514	NONE 100 300 400 600 800 955	T			
	Show Previ	ous Report	Sync	Ар	ply ОК	Cancel				

A. Note the total number of **Script Iterations** and **Estimated Total Duration** to help determine how long it will take to run this script.

C. Select OK to close the Add/Modify Script window.

<u>善</u>			scr-test-1 - Cr	eate/	Modify Cross Connec	3					
+ - All					Display Syn	Batch-Create		Apply OK C	Cance		
CX Name: CX Type:	Cross-Connect scr-test-1 LANforge / UDP				Report Timer:	Cross-Connect fast (1 s)	Cross-Connect fast (1 s)				
	Endpoint A		Endpoint B		Pld Pattern	increasing	-	increasing	-		
Resource:	1 (fwa710-blue)	-	1 (fwa710-blue)	-	Min IP Port:	AUTO	-	AUTO	-		
Port:	3 (eth3)	-	4 (eth4)	•	Max IP Port:	Same	-	Same	-		
Min Tx Rate:	New Modem (56 Kbps)	-	New Modem (56 Kbps)	-	Min Duration:	Forever	-	Forever	-		
Max Tx Rate:	Same	-	Same	-	Max Duration:	Same	-	Same	-		
Min PDU Size:	AUTO	-	AUTO	-	Min Reconn:	0 (0 ms)	-	0 (0 ms)	-		
Max PDU Size:	Same	-	Same	-	Max Reconn:	Same	-	Same	-		
IP ToS:	Best Effort (0)	-	Best Effort (0)	-	Multi-Conn:	Normal (0)	-	Normal (0)	-		
Pkts To Send:	Infinite	-	Infinite	-		Script		Script			
						Thresholds		Thresholds			

D. The Script Type for Endpoint B is set to NONE because Endpoint A is controlling both ends of the connection in this symmetric script example.

<b>\$</b>		Add/Modify Script 📃 🔍 🗙										
Endpoint Name:	scr-test-1-B	Script Type:	NONE	•								
Script Name:	my-script	Group Action:	All	<b>~</b>								
Enable Script	Show Reports Syr	nmetric 🗌 Loop 🗌	Hide Iteration Details	🗌 Hide Legend 📄 Hide CSV								
Loop Count	Forever 💌	Script Iterations:	NA	Estimated Duration: NA								
Script Configuration												
	Show Previous Report	Sync	Аррly ОК	Cancel								

E. Select OK to close the Create/Modify Cross Connect window.

<b>\$</b>				LANforge	Manager Versio	n(5.3.3)				
<u>Control</u> <u>Repor</u>	rting <u>T</u> ea	ar-Off <u>I</u> nfo	Plugins							
					Stop All	Restart M	anager		Refresh	HELP
File-IO La	ver-4 (	Generic	Test Mar	Test Group	Resource Mar	Event Log A	lerts Por	Mar Mes	sages	
Status La	Status Layer-3 L3 Endps VoIP/RTP VoIP/RTP Endps Armageddon WanLinks Attenuators Collision-Domains									
Rpt Tim	Rpt Timer:     default (5 s)     Image     Go     Test Manager     all     Image     Select All     Start     Stop     Quiesce     Clear									
View	0 - 2	00		▼ Go		Displa	ay Cr <u>e</u> ate	e <u>M</u> odify	Delete	
				-Cross Con	nects for Selecte	d Test Manager				
Name	Туре	State	Pkt Rx A	Pkt Rx B	Bps Rx A	Bps Rx B	Rx Drop % A	Rx Drop % B	Drop Pkts A	Drop Pkts
scr-test-1	LF/UDP	Stopped	0	0	0	0	0	0	0	
				III						Þ

- 4. Start the Scripted Layer-3 Cross Connect.
  - A. Highlight the Layer-3 connection and select Start.

<u>\$</u>	LANforge Manager Version(5.3.3)										
<u>Control</u> <u>R</u> epo	rting <u>T</u> ear-Off <u>I</u> nfo	<u>P</u> lugins									
				Stop All	Restart M	anager		Refresh	HELP		
File-IO La	ver-4 Generic	Test Mar	Test Group	Resource Mar	Event Log A	lerts Port	Mar Mes	sades			
Status La	Status         Layer-3         L3 Endps         VolP/RTP         VolP/RTP         Armageddon         WanLinks         Attenuators         Collision-Domains										
Rpt Tim	Rpt Timer: default (5 s) 🔻 Go Test Manager all 💌 Select All Start Stop Quiesce Clear										
View	0 - 200		▼ Go		Displa	ay Cr <u>e</u> ate	Modify	Delete			
	L		-Cross Conr	nects for Selected	d Test Manager						
Name	Type State	Pkt Rx A	Pkt Rx B	Bps Rx A	Bps Rx B	Rx Drop % A	Rx Drop % B	Drop Pkts A	Drop Pkts		
scr-test-1	LF/UDP Run	147,780	148,011	7,831,535	7,711,319	0	0	0			
Scr-test-1         LF/UDP         Run         147,780         148,011         7,831,535         7,711,319         0         0         0											
•									•		
Logged in to	brent-6port:40	02 as: Admin									

B. A script report window will pop up and show the details of each iteration of the scripted connection as it is run.

<u>\$</u>	Script Repo	rt for: scr-test-1-A		- • ×						
<pre># peer: rx-pkts: 12202 rx-bytes: 62474 # rx-bps: 9995878 rx-bps-low-level: 106 # dropped: 0 drop percent: 0.000000 avg-r # rx-signal: 0 tx-link-speed: 100000000 peer-rx-link-speed: 1000000000 # peer-dropped: 0 peer drop percent: 0. # * Passed constraints *</pre>	124 rx-pps: 2440 rx-pps-ll: 115853 rx-latency(us): 0 avg-rt-lat 30 rx-link-speed: 1000000000 .0000	2440 ency(us): O peer-machine-load attenuation: O peer-rx-signa	1: 0.15 1: 0 peer-tx-link-speed: 1000000000							
<pre># iteration: 4/27 Endpoint: scr-test-1-A now: 1446685446147ms duration: 5001ms paused: 1000ms # iteration: 4/27 Endpoint: scr-test-1-A now: 1446685446147ms duration: 5001ms paused: 1000ms # tayplota-size: 1024 cfg-rate: 10000000 # tx-bpts: 6042 tx-bytes: 6187008 tx-bytes-low-level: 6440772 tx-pps: 1208 # tx-bps: 9997233 tx-bps-low-level: 10303175 # rx-pps: 1208 rx-bps: 0rx-lows: 0 machine-load: 0.14 # peer: rx-pts: 6042 rx-bytes: 6187008 rx-pps: 1208 rx-pps-ll: 1208 # rx-bps: 9997233 rx-bps-low-level: 10303175 # rx-tops: 0 rx-dups: 0 rx-oons: 0 machine-load: 0.14 # peer: rx-pts: 6042 rx-bytes: 6187008 rx-pps: 1208 rx-pps-ll: 1208 # rx-bps: 9997233 rx-bps-low-level: 10303175 # dropped: 0 drop percent: 0.0000 avg-rx-latency(us): 0 avg-rt-latency(us): 0 peer-machine-load: 0.14 # rx-signal: 0 tx-link-speed: 1000000000 rx-link-speed: 1000000000 attenuation: 0 peer-rx-signal: 0 peer-tx-link-speed: 1000000000 # peer-dropped: 0 peer drop percent: 0.0000 # peer-dropped: 0 peer drop percent: 0.0000 # taype: 1000000000 # taype: 1000000000 # tenuation: 0 peer-rx-signal: 0 peer-tx-link-speed: 1000000000 # peer-dropped: 0 peer drop percent: 0.0000 # peer-dropped: 0 peer drop percent: 0.0000# # taype: 5072 Endpoint: st taype: 146695452149ec duption: 5000ec paused: 1001mc</pre>										
<pre># iteration: 5/27 Endpoint: scr-test-1- # payload-size: 1280 cfg-rate: 1000000C # tx-pkts: 4880 tx-bytes: 6246400 tx-by # tx-bps: 9994240 tx-bps-low-level: 10: # rx-pkts: 4880 rx-bytes: 6246400 rx-bp # rx-pps: 976 rx-bps: 9994240 rx-bps-lo # rx-qrops: 0 rx-dups: 0 rx-ooo: 0 mach # peer: rx-pkts: 4880 rx-bytes: 624640 # rx-bps: 9994240 rx-bps-low-level: 10: # dropped: 0 drop percent: 0.0000 ayg- # rx-signal: 0 tx-link-speed: 10000000 # peer-dropped: 0 Geer drop percent: 0. # * Passed constraints *</pre>	A now: 1446685452148ms dur ) rtes-low-level: 6451360 tx-p 322176 (rtes-low-level: 6451360 yw-level: 10322176 inne-load: 0.11 30 rx-pps: 976 rx-pps-ll: 97 322176 rx-latency(us): 0 avg-rt-lat 30 rx-link-speed: 1000000000 .0000	ation: 5000ms paused: 1001ms ps: 976 6 ency(us): 0 peer-machine-load • attenuation: 0 peer-rx-signa	1: 0.11 1: 0 peer-tx-link-speed: 1000000000							
Pause Clo	ose Save File	Graphical Display	Invert RX-Signal X Axis							

C. At the conclusion of the script, the report window will display a summary of the entire scripted connection results. Full Script Report for this example:

results. Full script Report to	or mis exampl	e:								
🕌		Script Rep	oort for: s	cr-test-1-	A					
Started test at: Fri Nov 6 15:47 Iteration Duration: 5000ms Paus Number of running endpoints at en System Load at end of first itera	2:43 2015 e Duration: 1000ms d of first iterati tion: 0.00	on: 2								•
Endpoint Information: Endpoint ID: scr-test-l-A T	ype: LANFORGE_UDP	Peer Endp	oint ID:	scr-test-l	-В					
Summary data for each iteration:										
## pld-size cfg-rate tx - (bytes) (bps) 0* 60 10000000 995	-bps rx-bps - peer 08592 9998592	rx-bps-LL peer 16997606 13276320	tx-pps - 20830 9762	rx-pps peer 20830 9762	tx-pkts 104152	rx-pkts peer 104152 48810	cx-drops peer 0	drop% peer 0.000	rx-lat(ms) peer 0	
2* 256 10000000 999 3* 512 10000000 999 4* 1024 10000000 999 5* 1280 10000000 999	9997926           95878         9995878           97517         9997517           98336         9998336	11638211 10815853 10407571 10326406	4882 2440 1220 976	4882 2440 1220 976	24409 12202 6102 4882	24409 12202 6102 4882	0 0 0	0.000	0 0 0	
6* 1460 10000000 999 7* 1472 10000000 999 8* 1514 10000000 999 9* 60 10000000 9999	98080 9998080 97824 9997824 94822 9994822 95059 99995059	10285696 10283088 10549357 169997971	856 849 825 208342	856 849 825 208342	4280 4245 4126 1041710	4280 4245 4126 1041710	0 0 0	0.000	0 0 0	
10*         128         10000000         9996           11*         256         10000000         9996           12*         512         10000000         9997           13*         1024         10000000         9996	38275         99988275           38691         99968691           '1072         99971072           34998         99984998	132796928 116369804 108171824 104085946	97645 48813 24407 12205	97645 48813 24407 12205	488224 244113 122035 61026	488224 244113 122035 61026	0 0 0	0.000 0.000 0.000 0.000	0 0 0	
14*         1280         100000000         9997           15*         1460         100000000         9998           16*         1472         100000000         9996           17*         1514         100000000         9996	'3120         99973120           33136         99983136           54109         99964109           52758         99962758	103253488 102859363 102816346 105508909	9763 8560 8489 8253	9763 8560 8489 8253	48815 42801 42444 41266	48815 42801 42444 41266	0 0 0	0.000	0 0 0	
18 60 1000000000 19833 Failed transmit-percent cons Failed peer transmit-percent Failed drop-percent constrai	29321 40513536 traint, reported: constraint, repor nt, reported: 79.5	68923642 19.8339% min: ted: 19.8217% 7% max: 5	413872 90 min: 90	84554	2069775	422854	1646921	79.570	107	
Failed peer-drop-percent com 19 128 1000000000 42437 Failed transmit-percent cons Failed peer transmit-percent	straint, reported: 76963 88404651 straint, reported: constraint, repor	79.5695% max 117412427 42.4377% min: ted: 42.4185%	: 5 414431 90 min: 90	86333	2072982	431836	1641146	79.168	105	
Failed drop-percent constrai Failed peer-drop-percent com 20 256 1000000000 71014 Failed transmit-percent cons	nt, reported: 79.1 straint, reported: 4921 289658292 traint, reported:	684% max: 5 79.1657% max 337180356 71.0145% min:	: 5 346750 90	141435	1734099	707315	1026784	59.211	19	
Failed peer transmit-percent Failed drop-percent constrai Failed peer-drop-percent con 21* 512 100000000 100002	constraint, repor nt, reported: 59.2 straint, reported: 25293 999352730	ted: 70.9948% 114% max: 5 59.2126% max 1081330883	min: 90 : 5 244147	243983	1220734	1219913	821	0.067	0	
22*         1024         100000000         99985           23*         1280         100000000         99985           24*         1460         100000000         999965           25*         1472         100000000         99965	8176         999858176           38896         999888896           33776         999903776           92902         999692902	1040867984 1032697750 1028668131 1028216749	122053 97645 85608 84892	122053 97645 85608 84892	610265 488227 428041 424462	610265 488227 428041 424462	0 0 0	0.000	0 0 0 0	
26* 1514 100000000 99967	Close	1055135110 Save File	82536	82536 Graphic	412678 al Display	412678	0 ert RX-Signal	0.000	0	-

A. per iteration details

B. raw CSV data for all iterations

C. spreadsheet matrices for creating your own 3D graphs

D. system information

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