Candela

ECHNOLOGIES

Creating Endpoint Hunt Scripts with CLI API

Goal: Use the the CLI to operate the Endpoint Scripting features of the Layer-3 Endpoints you create.

Layer-3 endpoints can manipulate their own transmission parameters using a variety of internal scripts, known as *Endpoint Scripts*. Using the lf_endp_script.pl CLI script, you can operate those internal endpoints behaviours.



This cookbook talks about Endpoint Scripts and CLI scripts at the same time. In this chapter, if the term **script** is used, assume **Endpoint Script**. Additionally, the terms operating and running can also be confusing. To keep the activities distinct, a LANforge user will **operate** a CLI script from a terminal. The LANforge server will **run** the Endpoint Script. A **CLI script** is a user-space perl script that issues CLI commands to a LANforge server.

The Forces at Play

There are a number of subsystems running while we operate an automated Endpoint Script, so let's review them:



- There will be Layer-3 connect constructed using lf_firemod.pl. (Don't forget: create the endpoints before creating the cross connect.)
- A managed endpoint of that connection will be configured with an Endpoint Script.
- The attending engineer will operate a CLI script that changes state the Layer-3 connection to Running
 The Layer-3 connection starts both endpoints transmitting, one of them starts running it's Endpoint Script that sets it's transmit parameters.
- Remember: Endpoint Scripts run inside the LANforge server process. CLI scripts run from the client side.

Let's Walk Thru Putting One Together

We recommend starting your first script off by the LANforge GUI to save an endpoint with an Endpoint Script. Next, inspect the LANforge database on the server for the script parameters. Take those parameters and adapt them to the operator's CLI script.

1. From the Layer-3 tab, open a connection tutorial-cx, and navigate to box 2. Click on the Script button.

					Display	sync Batch-create		Apply OK	cance
CX:Name: CX Type:	Cross-Connect tutorial-cx LANforge / UDP	_	Endpoint B	¥	Report Timer:	Cross-Connect default (5 s) Endpoint A	_	Endpoint B	-
Resource: Port: Min Tx Rate: Max Tx Rate: Min PDU Size: Max PDU Size:	1 (jedtest) 4 (sta301) New Modem (56 Kbps) Same AUTO Same	 * *<	1 (jedtest) 1 (eth1) New Moden (56 Kbps) Same AUTO Same	▼ ▼ ▼ ▼	Min IP Port: Max IP Port: Min Duration: Max Duration: Min Reconn: Max Reconn:	ALTO Same Forever Same O (O ms) Same	- - - - - -	AUTO Same Forever Same B (0 ms) Same	
IP ToS: Pkts To Send:	Best Effort (0) 🗸 Best Send: Infinite 🗸 Infin		Best Effort (0) Infinite	est Effort (0) ▼ nfinite ▼		Normal (0) Script Thresholds		Normal (0) Script Thresholds	

2. Name your script

<u></u>		Add/Modify Se	nipt		_ 0 ×
Endpoint Name:	tutorial-cx-A	Script Type:	NONE	-	
Script Name:	bunny-script	Group Action:	All	~	
🗹 Enable Script	🖌 Show Reports	Symmetric 🗌 Loop	Hide Iteration	Details 🔲 Hide Legend	Hide CSV
Loop Count	Forever	Script Iterations	: NA	Estimated Du	uration: NA
		Script Config	juration		
S	how Previous Repor	t Sync	Apply	OK Cancel	

3. Select your Script type, here we choose **ScriptHunt**

4		Add/Modify Scrip			
Endpoint Name:	tutorial-cx-A 💌	Script Type:	NONE	•	
Script Name:	bunny-script	Group Action:	NONE RFC-2544		
🖌 Enable Script	🖌 Show Reports 🛛 Sym	metric 🗌 Loop 🗌	ScriptHunt ScriptWL		Hide Legend 🛛 Hide CSV
Loop Count	Forever	Script Iterations:	ScriptAtten		Estimated Duration: NA
		Script Configur	ation		
s	how Previous Report	Sync	Apply	OK	Cancel
	not retroad hopoin	0,	Conder 1	0.0	Carrot

$\ensuremath{\mathbf{4}}$. We immediately see the parameters for the script:

<u>ه</u>		Add/Modif				
Endpoint Name: tu	utorial-cx-A	 Script Type: 	ScriptHunt	-		
Script Name: b	unny-script	Group Action:	All	-		
Enable Script	🖌 Show Reports 🛛	Symmetric 📃 Loc	p 🔲 Hide Iteration	Details	Hide Legend	Hide CSV
Loop Count	prever	 Script Iteration: 	s: 180 (180)		Estimated Duratior	n: 18 m (18 m
		Script Co	onfiguration			
USE_MSS	Show Dups 🔲 Show	w 000 🔲 Show A	ttenuation 🛛 🗹 Hide	Latency	Distributions	Hide Hunt St
🔲 Hide Constrain	nts					
Run Duration:	5 s (5	s)	 Pause Duration: 		1 s (1 s)	-
Starting Rate:	New Modem (5	56 Kbps) 💌 Max Iterations:			20	-
Max Drop Percent	5% (5%)	Max-Tx-Underrun:			10% (10%)	-
Max Jitter:	high (100	ms)	Max RT Latency:	Max RT Latency:		-
Threshold:	3% (30,	000)	-			
Paylo	ad Sizes A	Payloa	ad Sizes B		-Attenuations (de	dB)
60 128		60 128			NONE	-
256		256		100		
1024		1024		300		
1280		1280		400		
1472		1472		800		
1514		1514		955		
				J		
	Den inve Den 1	0.000	Annha	0.11		
SI	now Previous Report	Sync	Apply	OK	Cancel	

5. Let's modify the parameters to match our CLI command example below:

-			Add/M	Modify S	cript				
Endpoint Name:	tutorial-cx-A		 Script Type: 		ScriptHunt	-			
Script Name:	bunny-script					-			
Enable Script	Show Repor	rts 🔲 Symme	tric 🔲 Loop 📃	Hide It	eration Details 🔲 I	Hide Legen	d 🔲 Hide CSV		
Loop Count	20 (20)		 Script Iteratio 	ns:	540 (540)	E	stimated Durati	on: 1.5 h (1.5 h))
			Scr	ipt Con	iguration				-1
USE_MSS	Show Dups	Show 000	Show Attenu	uation	Hide Latency Dis	stributions	Hide Hunt S	Steps	
🔲 Hide Constrain	ts								
Run Duration:		5s (5	s)	-	Pause Duration:		5s (5s)	-
Starting Rate:		New Moden (56	Kbps)	-	Max Iterations:		5		-
Max Drop Percent		10% (10%)		-	Max-Tx-Underrun:		10% (10%)	-	-
Max Jitter:		small (20 m	s)	-	Max RT Latency:		high (100 ms)	-
Threshold:		3% (30,0	00)	-					
Pa	yload Sizes A-		Р	ayload	Sizes B	_		ns (ddB)	-
60 128			1472				1.1.14	-	
250 512						0,100,300,5	00,550,600,650,700,750	,850,900,950	
1024 1280						l Inc.			
1460 1472									
1514									
			J						
	Show	Previous Per	art Sunc	_	Apply	OK	Cancel		
	SHOW	r revious Repi	Sync		Abbia	OR	Carleer		

6. In a LANforge terminal, let's look at at /home/lanforge/DB/DFLT/endps.db We will search for bunnyscript and we'll inspect the resulting CLI command.

9								
<u>File E</u> dit	View S	earch	Terminal	Help				
> cd DB/D	FLT							
anforge@j > grep bu ndp.db:se 0, 60,128	edtest nny-scr t_scrip ,256,51	~/DB/DH ipt *dH t tutor 2,1024,	LT 5 rial-cx-A ,1280,146	bunny-script 37120 ScriptH 0,1472,1514 1472 0,100,300,	lunt '5000 5000 1 500,550,600,650,	.00000,20000,1000 700,750,850,900,	00,20,56000,30 950 NONE' ALL	000, 1, 1 000
antorge⊛j ≻	eutest	~/06/01	-L I					~
t_script	tutoria	l-cx-A	bunny-se	ript 37120 ScriptHunt				~
'5000 50	00 1000	00,200	00,100000	1,20,56000,30000,1,100000,	60,128,256,512,	1024,1280,1460,	1472,1514 1472	0,100,300 🗸
				101				>

7. Now we can craft this command into a CLI script. In a CMD window, we can write the formatted CLI script arguments:

```
C:\> .\lf_endp_script.pl --mgr jedtest --resource 1 ^
--action set_script --script_type Hunt --script_name bunny-script ^
--endp_name tutorial-CX-A -loops 1 --flags 37120 ^
 --private "5000 5000 100000,20000,100000,20,56000,30000,1,100000, 60,128,256,512,1024,1280,1460,1472,1514 1472 0,100,300,
```

💼 In the CMD window, use double-quotes 🔳 for quoted script arguments. Using single-quotes will break your command.

In a Linux terminal, we can use double " or single ' quotes:

- \$./lf_endp_script.pl --mgr jedtest --resource 1 \
 --action set_script --script_type Hunt --script_name bunny-script \
 --endp_name tutorial-CX-A -loops 1 --flags 37120 \
 --private '5000 5000 100000,20000,100000,20,56000,30000,1,100000, 60,128,256,512,1024,1280,1460,1472,1514 1472 0,100,300,
 - 8. We can start the connection and the Endpoint Script will immediately begin running:

If endp script --mgr jedtest --resource 1 --action start cx --cx name tutorial-CX

9. If the number of loops is fixed, it will eventually quiesce and stop itself. If we need to stop it and let inflight packets come to rest, we can quiesce it:

If endp script --mgr jedtest --resource 1 --action quiesce cx --cx name tutorial-CX

We could also use action stop_cx to immediately stop the connection.

10. If you have a LANforge GUI running, the Endpoint Script report will automatically display in a GUI window as soon as the connection starts. To display it to the terminal, you need to enable debug output:

lf_endp_script.pl --action show_report --endp_name tutorial-CX-A --quiet no

Or to save it to a text file:

lf_endp_script.pl --action show_report --endp_name tutorial-CX-A --quiet no > /home/lanforge/Documents/report.txt

11. To remove the script:

lf endp script.pl --action remove script --endp name tutorial-CX-A

At the CLI Command Level

Review of the set_script CLI command

We have covered creating endpoints in earlier cookbooks. The perl script lf endp script.pl was created to modify endpoints and operate their Endpoint Scripts. That script is using the set_script CLI command (documented here). A call to it looks like:

set_script tutorial-cx-A bunny-script 37120 ScriptHunt '...' ALL 20

Endpoint Scripting Uses Large Parameters

That vaque '...' section is the **private** parameter which is a parameter list each script type requires. The private parameter combines a series of constraints (sub-parameters). For the ScriptHunt, we might use:

run_duration	pause_duration	constraints	payload	_sizes_a	payload	_sizes_b	attenuations	attenuator
5000								I



drops,jitter_us,latency_us,max_steps,start_rate,accuracy,is_bps,max_tx_slowdown

Accuracy is also Threshold, max_tx_slowdown is also Underrun. The result is a very long line that has to be

surrounded the the CLI level by one pair of single quotes:

5000 5000 100000,20000,100000,20,56000,30000,1,100000, 60,128,256,512,1024,1280,1460,1472,1514 1472 0,100,300,500,550,600,650,760,750,850,900,950 NONE

Write these parameters very carefully! Your first mistake is likely going to involve misplaced apostrophes.

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