

## Generating Armageddon Traffic Containing Random MAC Addresses

**Goal**: Set up and run traffic containing random MAC addresses using the LANforge Armageddon feature.

• For more information, see the LANforge User's Guide: Armageddon (Accelerated UDP)

In this test scenario, LANforge Armageddon is set up to run with random MAC addresses. This is useful when performance/stress testing network devices that may not be able to keep up with high-speed traffic containing rapidly changing MAC addresses.

**Note**: In order to use the LANforge Armageddon feature, your system must have the LANforge kernel patch applied and your system must be properly licensed. Please feel free to contact us at <a href="support@candelatech.com">support@candelatech.com</a> if you would like to obtain a demo license for the Armageddon feature.

- 1. Configure the physical interfaces.
  - A. Go to the Port Manager and select ports eth2 and eth3

LANforge Manager Version(5.3.6)	×											
Control Reporting Tear-Off Info Plugins												
Stop All Restart Manager Refresh HE												
Layer-4         Generic         Test Mgr         Test Group         Resource Mgr         Event Log         Alerts         Port Mgr         VAP Stations         Messages           Status         Layer-3         L3 Endps         VolP/RTP         VolP/RTP         Armageddon         WanLinks         Attenuators         File-10												
Disp: 192.168.100.239:0 Sniff Packets 1 Clear Counters Reset Port Delete												
Rpt Timer: medium (8 s) ▼ Apply I View Details Create Modify Batch Modify												
All Ethernet Interfaces (Ports) for all Resources.	_											
Port Pha Down IP SEC Alias Parent Dev RX Bytes RX Pkts Pps RX bps RX TX Bytes TX Pkts Pps TX												
1.1.0 I 192.168.100.103 0 eth0 1,599,881 13,894 6 5,964 6,749,974 9,032	4											
1.1.1 0 0.0.0.0 0 eth1 0 0 0 0 0 0	D											
1.1.2 0 0.0.0.0 0 eth2 6,067,356, 4,007,503 0 0 6,065,332, 4,006,407	0											
1.1.3 0.0.0.0 0 eth3 6,065,332, 4,006,407 0 7 6,067,358, 4,007,521	0											
1.1.4 0 0 0 0 0 0 0	2											
1.1.5 0 0 0 0 0 0	2											
Longed in to: 192168100103:4002 as: Admin	-											

## B. Modify ports eth2 and eth3

	Current: LINK-	UP 1000bt-FD AUTO-N	Port Status Info IEGOTIATE TSO GS	ormation O GRO	\$						
	Driver Info: Port	Type: Ethernet Drive	er: igb(5.4.0-k) Bu	s: 0000:0a:0	0.0 Cur: 2.5	GT/s xl Max: 2.5GT/s xl					
Enable	Port Configurables General Interface SettingsPort Rates										
Set IF Down Set MAC	Down	Down Aux-Mgt									
Set TX Q Len Set MTU Set Offload Set Rate Info Set PROMISC Set Rx-All/FCS	DHCP-IPv6	DHCP-IPv6	DHCP-IPv6	DHCP-IPv6	DHCP-IPv6	DHCP Release	DHCP Vendor ID: DHCP Client ID:	None None	-	O 100bt-FD O 1000-FD O 10G-FD	<ul><li>✓ 100bt-HD</li><li>✓ 100bt-FD</li></ul>
	DNS Servers:	BLANK 10.0.0102/24 255.255.255.0	Peer IP: Global IPv6:	NA		Autonegotiate	✓ 1000-FD □ 10G-FD				
	IP Mask:		Link IPv6:			Renegotiate	☐ 40G-FD ✓ Flow-Control				
Set Bypass	Alias:	00.20.19.00.56.d2	MTU:	1500		PROMISC RX-ALL	Offload				
Set CPU Mask	Br Cost:	Ignore	Priority:	Ignore	-	RX-FCS	UFO Enabled				
	Rpt Timer: CPU Mask:	medium (8 s) 🔻 NO-SET 🗸	Watchdog: WiFi Bridge:	0 NONE		Bypass Power-UP	LRO Enabled				
RADIUS						Bypass Disconnect	GRU Enable				

- A. In this example, eth2 and eth3 are connected to another LANforge system running a WanLink so that the Armageddon traffic can be sniffed on the other machine's interface
- B. NOTE: Be sure that both ports are in Promiscuous mode by selecting the Set PROMISC and PROMISC checkboxes
- C. Configure each port with a valid IP address, then click  $\ensuremath{\mathsf{OK}}$

			Port Status Info	ormation			
	Current: LINK-	UP 1000bt-FD AUTO-	NEGOTIATE PROMIS	C		2	
	Driver Info: Port	Type: Ethernet Driv	er: igb(5.4.0-k) Bu	s: 0000:0b:00.0	) Cur: 2.5	GT/s x1 Max: 2.5GT/s x1	
			Port Configur	ables			
		General In	terface Settings		1	Port Rates	-Advert Rates
Set IF Down						Q 10bt-HD	☑ 10bt-HD
Set MAC	Down	Aux-Mgt				O 10bt-FD O 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	-	0 10G-FD	🖌 100bt-FD
Set Offload	DNS Soniors	PLANK	Boor IP:	NA		<ul> <li>40G-FD</li> <li>Autonegotiate</li> </ul>	₽ 1000-FD
Set Rate Info	IR Addroses	10.0.0.102/24	Global IPv6				🔲 10G-FD
Set PROMISC	IP Mack	255 255 255 0	Link IPv6	DELETED		🗌 Renegotiate	40G-FD
Set Rx-All/FCS	Gateway IP:	0.0.0.0	IBV6 GW	DELETED		🗌 Restart Xcvr	Flow-Contro
🗌 Set Bypass	Alias:	0.0.0.0	MTU:	1500		PROMISC	, Offload
Set Bridge Info	MAC Addr:	00:30:18:cc:5b:d3	TX 0 Len	1000		RX-ALL	TSO Enable
Set CPU Mask	Pr Cost	Ignore	Priority	lanore		RX-FCS	UFO Enable
— Services —	Di Cosc.		] + Horicy.	Ignore		Bypass NOW!	GS0 Enable
	Rpt Timer:	medium (8 s) -	Watchdog:	0	<b></b>	Bypass Power-UP	LRO Enable
FTP	CPU Mask:	NO-SET	WiFi Bridge:	NONE	-	Bypass Power-DOWN	GRO Enable
RADIUS						Bypass Disconnect	1

For more information see LANforge User's Guide: Ports (Interfaces)

- 2. Create the Armageddon cross-connect.
  - A. On the Armageddon tab, click Create

LANforge Manager Version(5.3.6)												
Control Reporting Tear-Off Info Plugins												
Stop All Restart Manager Refresh HELP												
Layer-4         Generic         Test Mgr         Test Group         Resource Mgr         Event Log         Alerts         Port Mgr         VAP Stations         Messages           Status         Layer-3         L3 Endps         VolP/RTP         VolP/RTP         Armageddon         WanLinks         Attenuators         File-IO												
Rpt Timer:     fast     (1 s)     Go     Test Manager     all     Select All     Start     Stop     Quiesce     Clear       Display     Crgate     Moglify     Batch Modify     Delete												
-Armageddon: Kernel Accelerated Connections												
Name     EID     State     Endpoints (A $\leftrightarrow$ B)     Pkt Tx A $\rightarrow$ B     Pkt Tx A $\leftarrow$ B     bps A $\rightarrow$ B     bps A $\leftarrow$ B     Avg RTT     Req A $\rightarrow$ B     Req A $\rightarrow$ B	Rpt											
- Armageddon: Kernel Accelerated Connection Endpoints												
Name         EID         Run         Script         Pps TX         Pps RX         Tx Pkts         Rx Pkts         Tx Bytes         Rx Bytes         Dropped         Rx Drop %         CX Drop	ped											
Logged in to: 192.168.100.103:4002 as: Admin												

B. Enter a CX Name, select ports eth2 and eth3, then enter the speed and packet size for both endpoints

	Create/Modify Armageddon Endpoint 🕑 🔗 🛛												
+ - All					Display Refresh Apply	/ OK Cancel							
0	Cross-Connect			9	Cross-Connect								
CX Name:	rand-macs			Rpt Timer:	fast (1 s)								
CX Type:	Armageddon UDP			Test Manager	default tm								
Quiesce:	3 (3 sec)		-		TX Endpoint (endpoint A)	BX Endpoint (endpoin							
	Relative-Timestamps			Src MAC:	DEFAULT	DEFAULT							
	TX Endpoint (endpoint A)		RX Endpoint (endpoint B)	Dest MAC:	DEFAULT	DEFAULT							
Endp Name:	rand-macs-A		rand-macs-B	Src MAC Cnt:	rc MAC Cnt: 0 0								
Shelf:	1	-	1	Dst MAC Cnt:	0	0							
Resource:	1 (jw2)	-	1 (jw2)	Min Src IP:	DEFAULT	DEFAULT							
Port:	2 (eth2)	-	3 (eth3) 🔻	Max Src IP:	DEFAULT	DEFAULT							
Pps Tx:	1 Kpps (1,000)	-	1 Kpps (1,000) 🗸	Min Src Port:	9	9							
Min Pkt Size:	1514 BYTES	-	1514 BYTES -	Max Src Port:	9	9							
Est. Rate:	12.112 Mbps		12.112 Mbps	Min Dst IP:	DEFAULT	DEFAULT							
Max Pkt Size:	1514 BYTES	-	1514 BYTES -	Max Dst IP:	DEFAULT	DEFAULT							
Pkts to Send:	0		0	Min Dst Port:	9	9							
Multi-Pkt:	0	-	0	Max Dst Port	9	9							
Burst:	DEFAULT (1)	-	DEFAULT (1)		1-								

C. Enter values for the Source and Destination MAC addresses, specify a MAC count, and deselect Use Router MAC for both endpoints.

			Create/Modify Armag	eddon Endpoint		$\odot$ $\diamond$ $\diamond$				
+ - All					Display Refresh Ap	ply OK Cancel				
0	Cross-Connect				Cross-Connect fast (1 s)					
CX Name:	rand-macs			Rpt Timer:						
CX Type:	Armageddon UDP		•	Test Manager	default tm					
Quiesce:	3 (3 sec)		•	•	TX Endpoint (endpoint A)	RX Endpoint (endpoint I				
	Relative-Timestamps			Src MAC:	00:30:18:cc:5b:d2	00:30:18:cc:5b:d3				
	TX Endpoint (endpoint A)		RX Endpoint (endpoint B)	Dest MAC:	00:30:18:cc:5b:d3	00:30:18:cc:5b:d2				
Endp Name:	rand-macs-A		rand-macs-B	Src MAC Cnt:	0	0				
Shelf:	1	-	1	Dst MAC Cnt:	0	0				
Resource:	1 (jw2)	-	1 (jw2)	Min Src IP:	DEFAULT	DEFAULT				
Port:	2 (eth2)	-	3 (eth3)	Max Src IP:	DEFAULT	DEFAULT				
Pps Tx:	1 Kpps (1,000)	-	1 Kpps (1,000)	Min Src Port:	9	9				
Min Pkt Size:	1514 BYTES	-	1514 BYTES	Max Src Port	9	9				
Est. Rate:	12.112 Mbps		12.112 Mbps	Min Dst IP:	DEFAULT	DEFAULT				
Max Pkt Size:	1514 BYTES	-	1514 BYTES	Max Dst IP	DEFAULT	DEFAULT				
Pkts to Send:	0		0	Min Dst Port	9	9				
Multi-Pkt:	0	-	0	Max Det Port	9					
Burst:	DEFAULT (1)	-	DEFAULT (1)		-					
8	TX Endpoint (endpoint A)		RX Endpoint (endpoint B)							
Thread-ID:	0		0							
	Thresholds		Thresholds							
	Script		Script		N					
	Random Payload Size		Random Payload Size		N.					
	Use Router MAC		Use Router MAC							
	🗌 UnManaged		UnManaged							

For more information see LANforge User's Guide: Armageddon (Accelerated UDP)

- 3. Run the Armageddon cross-connect and verify results with Wireshark.
  - A. Select the Armageddon connection then click Start

•				LAN	forge Ma	anager	Version(5	.3.6)					
Control Re	porting	Tear-	Off <u>I</u> nfo <u>P</u> l	lugins 🔉									
				N		9	Stop All	Resta	art Manager		Refresh	HELP	
Layer-4 Status	Layer-4         Generic         Test Mgr         Test Group         Resource Mgr         Event Log         Alerts         Port Mgr         VAP Stations         Messages           Status         Layer-3         L3 Endps         VolP/RTP         VolP/RTP Endps         Armageddon         WanLinks         Attenuators         File-IO												
Rpt Timer:     fast     (1 s)     Go     Test Manager     all     Select All     Start     Stop     Quiesce     Clear       Display     Crgate     Modify     Batch Modify     Delete													
Armageddon: Kernel Accelerated Connections													
Name	EID	Stat	e End	lpoints (A ↔ B)	Pkt Tx A	$A \rightarrow B$ Pkt Tx A $\leftarrow B$ bps A $\rightarrow B$ bps A $\leftarrow B$ Avg RTT Req A $\rightarrow B$ Req A $\leftarrow B$ F							
rand-macs	14.2 F	Run	rand-m	acs-A <=> ra	44	,086	44,080 12,	318,661 12,	132,205	357	1,000	1,000	
J.													
				Armage	ddon: Ker	nel Accele	rated Conn	ection Endp	oints-				
Name	EID	Run	Script	Pps TX F	ps RX	Tx Pkts	Rx Pkts	Tx Bytes	Rx Bytes	Dropped	Rx Drop %	CX Dropped(	
rand-ma	1.1.2.1	~	None	996	995	44,086	43,941	66,746,204	4 66,526,674	0	0	0	
rand-ma	1.1.3.2		None	996	996	44,080	44,225	66,737,120	66,956,650	0	0	0	
Logged in t	o: 192	.168.10	0.103:4002	as: Admin									

B. On the **Port Mgr** tab of the other LANforge system, select one of the physical interfaces in the Armageddon connection

0						LANf	orge M	anager Ve	rsion(5.3.	6)				$\sim$ $\times$
<u>C</u> ontrol	Repor	ting	Tear-C	ff <u>Info P</u> lu	gins									
	Stop All Restart Manager Refresh HELP													HELP
Layer-4 Status	Layer-4         Generic         Test Group         Resource Mgr         Event Log         Alerts         Port Mgr         vAP Stations         Messages           Status         Layer-3         L3 Endps         VolP/RTP         VolP/RTP Endps         Armageddon         WanLinks         Attenuators         File-IO													File-I0
Disp: 192.168.100.239:0 Sniff Packets 🔓 1 Clear Counters Reset Port Delete														
	Rpt Timer:     medium     (8 s)     Apply     Bring up the Wireshark packet sniffer. Only works if this machine supports X, so you must install CygwinX (Free) or Exceed to function on Windows platforms.       All Ethernet Interfaces (Ports) for all Resources.													
Port	Pha	Dowr	n	IP	SEC	EC Alias Parent RX Bytes RX Pkts Pps RX bps RX TX Bytes TX F				TX Pkts	Pps TX			
1.1.0			192.1	168.100.103	0	eth0		706,894	6,587	10	8,998	3,167,401	4,236	7
1.1.1			0.0.0	.0	0	ethl		0	0	0	0	1,326	17	0
1.1.2			10.0.	0.102	0	eth2		239,116,618	157,937	996	12,068	239,338,262	158,109	996
1.1.3			10.0.	0.103	0	eth3		239,486,034	158,181	996	12,069	239,267,818	158,051	996
1.1.4			0.0.0	.0	0	eth4		0	0	0	0	786	9	0
1.1.5			0.0.0	.0	0	eth5		0	0	0	0	1,326	17	0
1	1.1.4         0.0.0.0         0         etrify         0         0         0         0         786         9         0           1.1.5         0         0         0         0         0         1.326         17         0													
Loggod	in to:	1021	69 1 0	102,4002	201 0	dmin								
Logged	11100	192.1	00.10	0.100.4002	as: A	unnin								

C. Click **Sniff Packets** to launch Wireshark and begin sniffing traffic.

Capturing from eth2 [Wireshark 2.1.1 (Git Rev Unknown from unknown)] (on jw2)												
File Edit View Go Capture Analyze Statistics	Telephony Tools Internals Help	3										
• • <u>/</u> • <u>/</u> • • × c	Q ↔ ≫ ७ ⊼ ⊻ 🗏 🖬 ⊕ = ₫ 🖽 🙀	¥ 🍢 🕷 😂										
Filter:	▼ Expression Clear Apply Save											
No. Time Source	Destination Protocol Length Info											
23418 23.555371962 10.0.0.103	10.0.0.102 PKTGEN 1514 Seq: 3331359	-										
23419 23.556324632 10.0.0.103	10.0.0.102 PKTGEN 1514 Seg: 3331360											
23420 23.557193747 10.0.0.103	10.0.0.102 PKTGEN 1514 Seq: 3331361											
23421 23.55814824110.0.0.103	10.0.0.102 PKTGEN 1514 Seq: 3331362											
23422 23.559278056 10.0.0.103	10.0.0.102 PKTGEN 1514 Seq: 3331363	*										
• (												
Finame 1: J14 Dics JetwayIn cc:5b:d3 (00: Finame 1: J14 Dics) Ethernet II, Src: JetwayIn cc:5b:d3 (00: Internet Protocol Version 4, Src: 10.0.0 User Datagram Protocol, Src Port: 9, Dst Linux Kernel Packet Generator	, 1914 bytes taptored (12112 b)ts/ on interface 0 30:18:cc:5b:d3), Dst: JetwayIn_cc:5b:d2 (00:30:18:cc:5b:d2) .103, Dst: 10.0.0.102 Port: 9											
0000 00 20 19 cc 5h d2 00 20 19 cc 5h d2												
0010 05 dc 79 3b 00 00 20 11 07 0a 0a 00	0 0 67 0a 00v:	-										
0020 00 66 00 09 00 09 05 c8 00 00 be 9b	p e9 55 00 32 .fU.2											
0030 79 3c 14 e1 8c 39 35 55 a5 5b 00 02	2 00 00 00 00 y<95U .[											
0040 00 00 00 00 00 02 00 00 00 07 00 00	0 00 0b 00 00											
0050 00 0f 00 00 00 12 33 21 11 67 8e 5b	o 2f f8 00 003! .g.[/	-										
● M eth2: <li>live capture in progress Pack</li>	kets: 57593 · Displayed: 57593 (100.0%)	Profile: Default										

A. Stop the Wireshark capture after a few seconds via the stop icon or pull-down menu (Capture>Stop)

D. Select several packets and note their MAC addresses

0				*eth2	[Wires	hark	2.1.1 (G	it Rev	Unkn	own f	rom unk	nown)	l (on jv	v2)	N	、 、	0	
File Edit	View	Go Ca	apture	Analy	ze Sta	tistics	Telepho	ny To	ols Ir	nternal	s Help				h	2		
• •			3	3	×	C	<b>Q</b> &	• ->>>	8	$\overline{\otimes}$	⊻ [		÷	- 1	**	<b>X</b> [2]	] 🍢	•
Filter:									-	Expr	ession	Cle	ar	Apply	Save	ż		
No.	Time		Sourc	e			Destina	ation			Protocol	L Leng	th Inf	0				
23417	23.55	5371962	10.0.	0.103			10.0.0	102			PKTGEN	15	14 Seq	: 33313	59			-
23419	23.55	6324632	10.0.	0.103			10.0.0.	102			PKTGEN	15	14 Seq	: 33313	50			
23420	23.55	7193747	10.0.	0.103			10.0.0.	102			PKTGEN	15	14 Seq	: 33313	51			
23421	23.55	8148241	10.0.	0.103			10.0.0.	102			PKTGEN	15	14 Seq	: 33313	62			0
23422	23.55	9278056	10.0.	0.103			10.0.0.	102			PKTGEN	15	14 Seq	: 33313	63			
4													, .		-			,
Frame	23422:	1514 b	ytes	on wir	e (12)	112 bi	ts), 15	14 byt	es c	aptur	ed (1211)	2 bits	) ON 1	nterface	e 0	2)		-
* Ethern	et II, nation	SFC: J	etway	cc:5b:	5D:03	.30.1	0:18:CC	:50:03	), D	st: J	etwayin_	CC:5D:	d2 (00	:30:18:	cc:5b:a	2)		
Add	ress:	JetwavI	n cc:	5b:d2	(00:30	:18:0	c:5b:d2	)										
	0.				= L	G bit	: Globa	lly un	ique	addre	ss (fact	tory de	efault	)				
	0				= 1	G bit	: Indiv	idual	addre	ess (u	nicast)							
▼ Sourc	e: Jet	wayIn_	cc:5b	:d3 (00	9:30:1	8:cc:	5b:d3)											
Addi	ress:	Jetwayi	n_cc:	5b:d3	(00:30	18:0	c:5b:d3	)			/+		. f 1 +	x				
	0.				= L	G bit	· Indiv	idual	addre		nicast)	Lory de	erautt	)				-
0000 00	30 18	B cc 5b	d2 0	0 30	18 cc	5b d3	08 00	15 00	. 0 .	.[6								
0010 05	dc ds	5 22 00	00 2	0 11	ab 22	0a 00	00 67	9a 00			."q.							0
0020 00	66 00	0 09 00	09 0	5 c8	90 00	be 9b	e9 55 (	90 32	.f.		Ŭ.	2						
0030 d5	5 23 14	4 el 8c	3e b	1 90	72 ab	00 02	11 00 0	00 00	.#.	>	r							
0040 22	2 00 00	9 80 11	00 0	0 e8	21 00	00 cb	11 00	08 00	"··									
0050 11	00 00	) cb 11	00 0	0 80 .	21 00	00 80	11 00 0	90 a8	100			•						-
⊖ 💅 F	ile: "/va	ar/tmp/w	iresha	rk_eth2		Pac	ets: 111	662 · D	splay	ed: 11	1662 (100	).0%) ·	Droppe	d: 54	Prof	ile: Defa	ault	

E. Verify that the MAC addresses for each packet are different



For more information see LANforge User's Guide: Armageddon (Accelerated UDP)

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