

Virtual Router with DHCP Service

Goal: Setup a Virtual Router with one interface serving DHCP.

In this test scenario, a LANforge Virtual Router is created with one interface setup to serve DHCP to two remote redirect interfaces that are setup to be DHCP clients.

- 1. Setup a Virtual Router and two Netsmith Connections.
 - A. Go to the **Status** tab and click the **Netsmith** button

0	LANforge Manager	Version (5 4 3)		
Control Reporting Windows Info Test		(5.4.5)		
Control Reporting windows Into Test	chamban) fam		Manager	-freeh UED
	Chamber View Stop	All Restart	Manager <u>R</u>	erresh HELP
Status [Port Mgr Layer-3 L3 Endp	s Layer 4-7 WanLinks Resource	Mgr Alerts Mes	ssages [Warnings [Wifi-M	essages [+
License Info	Current Users		Saved Test Configurations	
Licenses expire in: 656 days.	* Admin from:127.0.0.1 gnuserver from:127.0.0.1	Configuration:	FACTORY_DFLT	Load
Support expires in: 656 days.		Download DB	Show Progress	Delete
Status Vie <u>w</u> : Ports by Resource 💌		Name:		Save
Realm 0	Manager/Resourc	e 1		
	Netsmith			
ogged in to: localhost:4002 as: Admin				2 stations: 21 01 00

B. Right-click in the Netsmith window and select New Router



- A. Follow steps discussed above for configuring the router
- C. Right-click in the Netsmith window and select New Connection



D. Accept defaults, Auto Create everything and click OK



E. Repeat and create a second connection.



F. Click the **Apply** button to commit the changes in Netsmith to the LANforge Server.



A. NOTE: Modifications in Netsmith are only sent to the LANforge-Server after Applying them

For more information see LANforge-GUI User Guide: Virtual Interfaces

2. Setup the WanLinks.

A. Right-click the first WanLink and select Modify WanLink



B. Enter values specific to your test and click OK

0			VRWL-1.1.000	0 - Crea	te/Modify WanI	Link			\odot
+ - All				N	A	pply OK Displa	y W	anLink & WanPaths	Cancel
Name: Presets:	WanLink Information VRWL-1.1.000 CUSTOM			- W3	2	WanLink Information Pass-Through Coupled-Mode		☐ HW Pass-Through ✓ Kernel-Mode	4
Port:	Endpoint A 4 (rddVR0b)	-	Endpoint B 6 (rddVR1b)	-	Resource: Rpt Timer:	1 fast (1 s)	_		▼▼
Transfer Rate: Delay:	New Modem (56 Kbps)	-	New Modem (56 Kbps) zero (0 us)	•	Reorder-Freq:	Endpoint A zero (0%)	-	Endpoint B zero (0%)	-
Jitter:	zero (0%)		zero (0%)	•	Dup-Freq: Drop Burst:	zero (0%) min 1 max 1	•	zero (0%) min 1 max 1	
Jitter-Freq:	2010 (0%)		2010 (0%)		Reorder Amt:	min 1 max 20 Script		min 1 max 20 Script	
8	Endpoint	A W	AN Paths	.W/P	Create	Endpoint B V	VAN	Paths	
Name	Tx Rate Disabled !	ury-v	Filter Pattern	Delay	Name Tx	Rate Disabled !	/- VV F	Filter Pattern	Delay

- A. **NOTE:** Kernel-Mode allows for much higher emulation speeds and supports all features of the normal WAN emulation mode
- B. Kernel-Mode is available for the WAN emulation if you are using a pre-compiled Linux kernel from the Candela downloads page

C. Right-click to toggle the WanLink status to Running (green).



D. Repeat for the second WanLink and set it to Running (green).



- 3. Setup the ports.
 - A. Right-click port rddVR0 and select Create Ports



B. Select the Bridge button from the available connection types, name it, and click OK

0			Create VLANs	on Port: 1.1.3			$\mathbf{v} \wedge \mathbf{x}$
O	○ MAC-VLAN ○ WiFi STA	 ○ 802.1Q-VLAN ○ Re ○ WiFi VAP ○ WiFi Mon 	direct	⊖ Bond	nnel		
0	Shelf	: 1	Resource:	l (lf0350-10ac) 🔻	Port: 3	(rdd∨R0)	-
a	VLAN ID:		DHCP-IPv4				
	Parent MAC:	8e:45:69:ee:6b:14	DHCP Client ID:	None 💌			
	MAC Addr:	xxx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx	IP Address:		Global IPv6:	AUTO	
	Quantity:	1	IP Mask or Bits:		Link IPv6:	AUTO	
			Gateway IP:		IPv6 GW:	AUTO	
	Bridge Name:	br0	#2 Redir Name:				
	STA ID:		SSID:			-	
	WIFI AP:		Key/Phrase:				
	WPA	WPA2	WEP				
4	Down						
	Apply	<u>C</u> ancel		R	eady		

C. Right-click the bridge port and select Modify Port



- A. NOTE: You will have to click the Sync button for your newly created bridge port to appear in the Netsmith window.
- D. Assign an IP address and IP mask, then click **Apply**

0		br0 (lf0350)-10ac) Configui	re Settings			\odot \times \times
		Current: UNKI	Port Status Inform	ation			
		Driver Info: Port 1	Type: Bridge Drive	r: bridge(2.3) Bus N/A			
			Dent Canfinunala				
Enable		General In	Port Configurab	les	_		
Set IF Down	Down	Aux-Mat	iterrace settings		Spanning-Tree		
Set MAC		DHCP Belease	DHCP Vendor ID:	None	Aging Time:	300	
Set TX Q Len		Secondary-IPs	DHCP Client ID:	None	Max Age:	20	
Set MTU	DNS Servers:	BLANK	Peer IP:	NA	Hello Time:	2	-
Set Offload	IP Address:	1.1.1.1	Global IPv6:	AUTO	Forwarding Delay:	15	-
	IP Mask:	255.255.255.0	Link IPv6:	AUTO			
	Gateway IP:	0.0.0.0	IPv6 GW:	AUTO			
	Alias:		MTU:	1500			
	MAC Addr:	de:09:d6:1c:f2:1e	TX Q Len	1000			=
	Rpt Timer:	medium (8 s) 🔻	WiFi Bridge:	NONE			
	Configured P	dge Information	Rem	ove Ports			
Services —	Configured P	onts current Port	Add	Ports			
FTP							
RADIUS							
]						
	Dript \/iew	Dataila	roho Ours	Apply OK	Consel	1	-
4							

E. Enter interface names rddVR0 and rddVR2 in the whitespace located below the **Add Ports** button so that you can add them as bridge members

		br0 (lf0350	-10ac) Configur	re Settings		($\overline{\mathbf{v}}$
		Current: UNK-	Port Status Inform	ation			
		Driver Info: Port T	Vine: Bridge Drive	r: bridge(2.3) Bus: N/A			
		Briter mer reiter	yper blidge blive	in bildge(210) businity			
			Port Configurab	les			
Enable —	_	General In	terface Settings		Spanning-Tree		
Set IF Down	Down	Aux-Mgt			Aging Time:	300	
Set MAC	DHCP-IPv6	DHCP Release	DHCP Vendor ID:	None	Bridge Priority:	32768	
Set IX Q Len	DHCP-IPv4	Secondary-IPs	DHCP Client ID:	None	Max Age:	20	
Set Offload	DNS Servers:	BLANK	Peer IP:	NA	Hello Time:	2	
Set Bridge Info	IP Address:	1.1.1.1	Global IPv6:	AUTO	Forwarding Delay:	15	-
	IP Mask:	255.255.255.0	Link IPv6:	AUTO			
	Gateway IP:	0.0.0.0	IPv6 GW:	AUTO			
	Alias:		MTU:	1500			
	MAC Addr:	de:09:d6:1c:f2:1e	TX Q Len	1000			
	Rpt Timer:	medium (8 s) 🔻	WiFi Bridge:	NONE			
- Services - HTTP FTP RADIUS	Brid	ge Information — orts Current Port	s Rem Add rddvR0 rddvR2	ove Ports Ports			
	Brint Mow	Dotaile	robo Sync	Apply OK	Cancol]	

F. Click ${\bf Add} \ {\bf Ports}$ to add the interfaces as bridge members, then click ${\bf OK}$

0		br0 (lf0350)-10ac) Configur	e Settings		($\overline{\mathbf{v}} \otimes \mathbf{x}$
		Current: LINK-U	JP PROBE-ERROR T	SO UFO GSO GRO			^
		Driver Info: Port T	ype: Bridge Drive	r: bridge(2.3) Bus: N/A			
			Port Configurab	les	N		
Enable		General In	terface Settings	0.0	Spanning-Tree		
Set IF Down	Down	Aux-Mgt			Aging Time:	300	-
Set MAC	DHCP-IPv6	DHCP Release	DHCP Vendor ID:	None 💌	Bridge Priority:	32768	-
Set IX Q Len	DHCP-IPv4	Secondary-IPs	DHCP Client ID:	None 💌	Max Age:	20	-
Set Offload	DNS Servers:	BLANK	Peer IP:	NA	Hello Time:	2	-
Set Bridge Info	IP Address:	1.1.1.1	Global IPv6:	AUTO	Forwarding Delay:	15	-
	IP Mask:	255.255.255.0	Link IPv6:	AUTO			
	Gateway IP:	0.0.0.0	IPv6 GW:	AUTO			
	Alias:		MTU:	1500			
	MAC Addr:	2a:6a:10:a5:8a:52	TX Q Len	1000			=
	Rpt Timer:	medium (8 s) 🔻	WiFi Bridge:	NONE			
[Brid	Ige Information	Rem	ove Ports			
Services —	rddVR0	rddVR0	Add	Ports			
	rddVR2	rddVR2					
P	Print <u>V</u> iew	Details P	robe Sync	Apply OK	Cancel		-

G. The Netsmith window now shows a bridge port with two bridge members



For more information see LANforge-GUI User Guide: Ports (Interfaces)

- 4. Setup DHCP Server and Clients.
 - A. Drag the bridge port into the virtual router.



B. Right-click the bridge port and select Modify



C. Select the 'DHCP' checkbox at the bottom of the window and enter in your desired DHCP Server configuration, then click **OK**

ck/double-click/drag s	upported R0(5)	rddVR0	VRWL-1,1,000 rddVR1
r P s	Create/M	odify Connection	×
ed		Interface-Cost:	1
s D Port 1-A:	11 (br0)	RIP-Metric:	1
Port 1-B: Skip	<auto create="" new="" port=""></auto>	OSPF Area:	
rsi Wanlink:	<auto create="" new="" wanlink=""></auto>	VRRP ID:	1
	-Auto Crooto Now Parts	VRRP Priority:	100
	KAULO Create New Port >	VRRP Interval:	1
Por Port 2-A: 🗹 Skip	<auto create="" new="" port=""></auto>	Next-Hop:	0.0.0.0
DHCP Lease Time:	300	Subnets (a.b.c.d/xx):	
DHCP DNS:	10.10.10.10		
OM DHCP Range Min:	1.1.1.100		
op DHCP Range Max:	1.1.1.110]	
Vor DHCP Domain:	domain1.com		
DHCPv6 DNS:		Next-Hop-IPV6:	·
IC DHCPv6 Range Min:		IPV6 Subnets (aaa::0/xx):	· · · · · · · · · · · · · · · · · · ·
ge DHCPv6 Range Max:			
ent, DHCPd Config File:			
-			
DHCP			
	OK	Cancel	
		III	

D. Right-click interface rddVR1 and select Modify Port



E. Select the 'DHCP' checkbox to make this interface a DHCP client, then click **OK**

		radvki (ir	0350-10ac) Con	ngure settings			
			Port Status Info	ormation			
		Current: L	INK-UP PROBE-ERR	OR TSO UFO GSO G	RO		
		Driver Info: F	ort Type: Redirect	-Device Peer: rdd	/R1b		
			Port Configur	ables			
Enable —		General In	terface Settings			Port Rates ——	-Advert Rates-
Set IF Down						O 10bt-HD	10bt-HD
Set MAC	Down	Aux-Mat				O 100bt-HD	10bt-FD
Set TX Q Len				News		O 100bt-FD O 1000-FD	100bt-HD
Set MTU	DHCP-IPv6	DHCP Release	DHCP vendor ID:	None		• 10G-FD	100bt-FD
Set Offload	DHCP-IPv4	Secondary-IPs	DHCP Client ID:	None	-	O Autonegotiate	1000-FD
Set PROMISC	DNS Servers:	BLANK	Peer IP:	NA			10G-FD
Set Rx-All/FCS	IP Address:	0.0.0.0	Global IPv6:	AUTO		Renegotiate	40G-FD
Set Bridge Info	IP Mask:	0.0.0.0	Link IPv6:	AUTO		Restart Xcvr	Flow-Contro
	Gateway IP:	0.0.0.0	IPv6 GW:	AUTO			,_
	Alias:		MTU:	1500		RX-ALL	Offload -
	MAC Addr:	6a:6f:f1:e7:e6:23	TX Q Len	1000		RX-FCS	TSO Enable
	Br Cost:	Ignore 🗸	Priority:	Ignore		Bypass NOW!	UFO Enable
	Dat Timor	modium (9 c) -	WiEi Bridge	NONE		Bypass Power-UP	GSO Enable
RADIUS	Kpt nimer:	mearam (0.5)	wiri bildge:			Bypass Power-DOWN	LRO Enable
						🗌 Bypass Disconnect	GRO Enable
	Print Vi	ew Details	Probe Sync	Apply	L QK	<u>C</u> ancel	

F. Repeat for interface rddVR3, then click Netsmith Apply



G. After the Netsmith apply, DHCP clients will acquire IP addresses from the DHCP server



A. Select the 'IPv4s' checkbox at the bottom of the Netsmith window to see the IP addresses of the DHCP clients

For more information see LANforge-GUI User Guide: Ports (Interfaces)

5. Create a Layer-3 Connection.

A. Go to the Layer-3 tab and click Create

				J - · · · · · · J - ·							
				LANfor	ge Manager	Version(5.4.3)				\odot \sim \times
<u>Control</u> <u>R</u> epor	ting Win	d <u>o</u> ws <u>I</u> nfo	Tests								
			Cham	ber <u>V</u> iew	<u>S</u> t	op All	Resta	art Manager		<u>R</u> efresh	HELP
Status Port	Mgr La	ayer-3 L3	Endps La	yer 4-7 Wai	nLinks Resou	rce Mgr Al	lerts N	lessages W	arnings W	/ifi-Messages	+
Rpt T	imer: fas	st (1 s)	▼ Go	Test Manager	all	Se	lect All	Start +	top - Qui	esce Clea	r
View	0 -	500		🔻 Go			Disp <u>l</u>	ay Cr <u>ea</u> te	Mo <u>d</u> ify	Delete	
				-Cross Co	nnects for Sele	cted Test Ma	anager —	-			
Name	Туре	State	Pkt Rx A	Pkt Rx B	Bps Rx A	Bps	Rx B	Rx Drop % A	Rx Drop % E	Drop Pkts A	Drop Pkts
•											Þ
ogged in to: Ic	calhost:4	002 as: A	dmin							2 statio	ns:210↓0

B. The RDD-FIRE connection for this example will use interfaces rddVR1 and rddVR3.

•			RDD-FIRE - Crea	te/M	odify Cross Con	nect			\odot	×
+ - All			\Im		Display	Sync Batch-Crea	e	Apply OK	Cance	el
CX Name:	Cross-Connect RDD-FIRE				Report Timer:	Cross-Connect fast (1 s)			•	
CX Type:	LANforge / UDP	_		-		Endpoint A		Endpoint B		
	Endpoint A		Endpoint B		Pld Pattern	increasing	-	increasing	-	
Resource:	1 (lf0350-10ac)	-	1 (lf0350-10ac)	-	Min IP Port:	AUTO	-	AUTO	-	
Port:	5 (rddVR1)	-	9 (rddVR3)	•	Max IP Port:	Same	-	Same	-	
Min Tx Rate:	28 Kbps	-	28 Kbps	-	Min Duration:	Forever	-	Forever	-	
Max Tx Rate:	Same	-	Same	-	Max Duration:	Same	-	Same	-	
Min PDU Size:	UDP Pld (1,472 B)	-	UDP Pld (1,472 B)	-	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-Copp:	Normal (0)	-	Normal (0)	-	
Pkts To Send:	Infinite	-	Infinite	-		Script	_	Script		=
						Thresholds		Thresholds	_	
								Intestidias		
2	Cross-Connect					Endpoint A		Endpoint B		
Test Manager	default_tm			-	Snd Buff Size:	OS Default	-	OS Default	-	
Quiesce:	3 (3 sec)			-	Rcv Buff Size:	OS Default	-	OS Default	-	
	Endpoint A		Endpoint B		Send Bad FCS:	zero (0%)	-	zero (O%)	-	
IP Addr:	AUTO	-	AUTO	-	Src MAC:	00:00:00:00:00:00	-	00:00:00:00:00:00	-	
	🗌 Replay File		🗌 Replay File			Use-Proxy		Use-Proxy		
	Loop		Loop		Proxy Addr:					
	Dest Mac		Dest Mac		Proxy Port:					
Filename:					Socket Priority:	0		0		
Dest MAC:		-		-						-

C. Verify the Layer-3 connection was created

0				LANforge I	Manager Versi	on(5.3.6)				\odot \land \times
Control Report	ting <u>T</u> ea	ar-Off <u>I</u> nfo	<u>P</u> lugins			3				
					Stop Al	Restart	Manager		Refresh	HELP
Layer-4 Gei	neric T	est Mgr T	est Group	Resource Mg	r Event Log A	lerts Port Mgr	vAP Stations	Message	s	
Status	Layer-3	L3 End	ps VolP	/RTP	/oIP/RTP Endps	Armageddon	WanLinks	Atte	nuators	File-IO
Rpt	Timer: fa	əst (1 s) 🔻 Go	Test Manage	er all 🔻	Select All	Start Sto	p <u>Q</u> uiesc	ce Clear	
viev	v [0	- 500		1.0	1	Dispidj		ino <u>u</u> ny	Delete	
	1	1		-Cross Co	nnects for Selected	Test Manager-	1		1	1
Name	Туре	State	Pkt Rx A	Pkt Rx B	Bps Rx A	Bps Rx B	Rx Drop % A F	Rx Drop % B	Drop Pkts A	Drop Pkt:
RDD-FIRE	LF/UDP	Stopped	0	0	0	0	0	0	C)
4										
Logged in to:	102168	100 106-40	02 as: Admi	n						
Logged in to.	152.100.	100.100.40	02 03. Admi							

For more information see LANforge-GUI User Guide: Layer-3 Cross Connects (FIRE)

6. Run LANforge-FIRE to yourself through LANforge-ICE!

A. Select the Layer-3 Cross Connect and click Start

				LANforge M	lanager Versio	n(5.3.6)				\odot
<u>Control</u> <u>R</u> epor	ting <u>T</u> ea	ar-Off <u>I</u> nfo	<u>Plugins</u>							
					Stop All	Restart	Manager		Refresh	HELP
Layer-4 Ger Status	neric T Layer-3	est Mgr 1 L3 End	Test Group lps VolP	Resource Mg /RTP V	r Event Log Ale oIP/RTP Endps	erts Port Mgr Armageddon	vAP Stations WanLinks	Message	s nuators	File-I0
Rpt	Timer: fa	ast (ls	s) 🔻 Go	Test Manage	r all 💌	Select All	Start <u>S</u> to	<u>Q</u> uieso	e Clear	
View	0	- 500		▼ Go		Display	Cr <u>e</u> ate	Mo <u>d</u> ify	Delete	
	1	1		-Cross Cor	nnects for Selected	Test Manager				
Name	Туре	State	Pkt Rx A	Pkt Rx B	Bps Rx A	Bps Rx B	Rx Drop % A F	🕅 🗛 🗛 🗛	Drop Pkts A	Drop Pkt
RDD-FIRE	LF/UDP	Run	184	184	27,750	27,822	0.541	0	1	
					\$					
4										•
Logged in to:	192.168.	100.106:40	02 as: Admi	n						

B. Go to the Status tab and click Netsmith to view the graphical representation of the setup



For more information see LANforge-GUI User Guide

Candela Technologies, Inc., 2417 Main Street, Suite 201, Ferndale, WA 98248, USA www.candelatech.com | sales@candelatech.com | +1.360.380.1618