

Bridging Multiple WAN-links

Goal: Create a star topology network similar to a central VPN server with remote offices.

Using LANforge Netsmith, we connect three ethernet ports with WAN-links. Each WAN-link has an ethernet port on one side and a virtual redirect on the other. The redirects are then bridged. We can then model the WAN environment by changing the latency (and other parameters) of the WANlinks. In this example, we are using ports eth2, eth3 and eth4 This emulates a bridged network, but it is also possible to do a similar configuration using a Virtual Router instead of a bridge to emulate a routed network.



1. Use Netsmith to create three WAN links

A. In the **Status** tab, click the **Netsmith** button

•	LANforge Manager Vers	sion(5.3.7)		\odot \sim \times					
<u>Control Reporting Tear-Off</u> Info Pl	ugins								
	Stop	All Resta	art 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 Endps Armageddon WanLinks Attenuators File-IO									
License Info	Current Users	1	Test Configuration Databa	se					
Licenses expire in: 702 days.	* Admin from:192.168.100.239 gnuserver from:127.0.0.1	List:		Load					
		Name:		Delete					
Support evoires in 702 days		Load Behavior:	Choose One 💌	Save					
Support expires in: 702 days.			Download DB	Show Progress					
	Virtual Shelf	1							
	Resource 2	1							
		_							
	Netsmith								
Configure or view the Virtual Router and CX configuration for the selected reso									
Logged in to: 192.168.100.103:4002	as: Admin								

C. Select New Connection



D. Create new WAN link connection

C	Net	tsmith configuration for Reso	urce: jw2(1.1) Version:	5.3.7	\odot
Q Q		Virtuai kouters	and connections		
Q Mgt-e	, L.A.	Create/Mo	dify Connection	×	
			Interface-Cost:	1	
	Port 1 A	2 (ath2)	RIP-Metric:	1	
eth2	FOILTA:	2 (GU12)	OSPF Area:	000.000.000.000	
	Port 1-B: 🗹 Skip	<auto create="" new="" port=""> ▼</auto>	VRRP IP:	0.0.0/24	
	WanLink: 🔲 Skip	<auto create="" new="" wanlink=""> 💌</auto>	VRRP ID:	1	
	Port 2-B: 🔲 Skip	<auto create="" new="" port=""></auto>	VRRP Priority:	100	
eth3	Port 2-A	<auto create="" new="" port=""></auto>	VRRP Interval:	1	
•		42200	Next-Hop:	·	
		43200	Subriets (a.b.c.d/xx):		
	DHCP DNS:				
eth4	DHCP Range Max				
	DHCP Domain				
			Next-Hop-IPv6:		
	DHCPV6 Papao Min		IPv6 Subnets (aaa::0/xx):		
	DHCPV6 Range Mini:				
	DHCPV0 Kange Max:				
	Drice'd coning Pile:				
eth1				JI	
eth5	NAT DHCP	DHCPv6 Custom DHCF	VRRP Cand-RP		
			Cancel		
WanLinks	Show Legend	🖌 Fire 🔄 IPv4s	Info Print	Sync Apply Clos	e .
WanLink Nar	mes 🗹 Port Names	🗹 Fire Names 🛛 Zero-IPv4s Ap	ply Progress: 10	0% Complete Ca	ncel Appl
Peer WanLin	nks 🗹 Parents	Col. Domains 🔲 IPv6s Ne	tsmith Status: OK		

- A. Select Port 1-A: eth2
- B. Select Port 1-B:Skip
- C. Click **OK**

E. A tentative WAN link is displayed



F. Click the Apply button at the bottom of the Netsmith window. This commits the WAN link to the resource.



G. Creating two more WAN links is a similar process

H. Repeat these steps:



- A. Right click, New Connection
- B. Choose eth3 for port 1-A and Skip for port 1-B, then OK
- C. Click Netsmith **Apply** to commit connection.
- D. Right click, New Connection
- E. Choose eth4 for port 1-A and Skip for port 1-B, then OK
- F. Click Netsmith Apply to commit connection.
- 2. Use Netsmith to create a bridge port

A. Right click, Select New Bridge



B. Create the bridge with the following attributes:

0			Create VLA	ls on Port:				\odot \otimes \otimes
O	○ MAC-VLAN ○ WiFi STA	○ 802.1Q-VLAN ○ Red ○ WiFi VAP ○ WiFi Monit	irect Bridge or WiFi Virtu	O Bond Bal Radio	⊖ GRE Tur	nel		
2	Shelf:	1	Resource:	1 (jw2)	•	Port:	l (ethl)	-
	VLAN ID:		DHCP-IPv4					
ľ	Parent MAC:	00:30:18:cb:b8:07	DHCP Client ID:	None	-			
	MAC Addr:	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	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						
	- N							

- A. Select Bridge
- B. Quantity: 1
- C. Bridge Name: br0

C. Click Netsmith Sync to bring the br0 port onto the Netsmith screen



D. Right click the br0 port and select Modify Port



E. In the text area below the Add Ports button, add the three virtual WAN link endpoints:

		br0 (j	w2) Configure S	ettings			\odot)
		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				
Enable ——		General Interface Settings						
Set IF Down	🗌 Down	🗌 Aux-Mgt			Aging Time:	300	-	
Set MAC	DHCP-IPv6	🕑 DHCP Release	DHCP Vendor ID:	None 🗸	Bridge Priority:	32768	-	
Set TX Q Len	DHCP-IPv4	Secondary-IPs	DHCP Client ID:	None 💌	Max Age:	20	-	l
Set MIU	DNS Servers:	BLANK	Peer IP:	NA	Hello Time:	2	-	l
Set Bridge Info	IP Address:	0.0.0.0	Global IPv6:	AUTO	Forwarding Delay:	15	-	l
_ occonage into	IP Mask:	0.0.0.0	Link IPv6:	AUTO				
	Gateway IP:	0.0.0.0	IPv6 GW:	AUTO				
	Alias:		MTU:	1500				
	MAC Addr:	02:c9:69:85:f4:5b	TX Q Len	1000				
	Rpt Timer:	medium (8 s) 🔻	WiFi Bridge:	NONE				
	Brid	dge Information	Rem	ove Ports	1			
— Services —	Configured Ports Current Ports							
	Add Ports							
	P rddvR1 rddvR3							
RADIUS			rddVR5					
					1	2		
						-0		
	,				1			
	Print View	Details P	robe Sync	Apply OK	Cancel			
								j

- A. rddVR1
- B. rddVR3
- C. rddVR5

F. Click Add Ports to enter the selection. You will see them show up in the Bridge Information table.

		510 ()	or otatao mom				00
		Current: LINK-U	IP PROBE-ERROR TS	SO UFO GSO GRO			
		Driver Info: Port T	ype: Bridge Drive	r: bridge(2.3) Bus: N/A			
			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 TX Q Len	DHCP-IPv4	Secondary-IPs	DHCP Client ID:	None 💌	Max Age:	20	-
Set MIU	DNS Servers:	BLANK	Peer IP:	NA	Hello Time:	2	-
Set Bridge Info	IP Address:	0.0.0.0	Global IPv6:	AUTO	Forwarding Delay:	15	-
_ set bridge into	IP Mask:	0.0.0.0	Link IPv6:	AUTO			
	Gateway IP:	0.0.0.0	IPv6 GW:	AUTO			
	Alias:		MTU:	1500			
	MAC Addr:	02:c9:69:85:f4:5b	TX Q Len	1000			
	Rpt Timer:	medium (8 s) 🔻	WiFi Bridge:	NONE			
	Brid	ge Information	Rem	ove Ports	1		
— Services —	Configured P	orts Current Port	s				
HTTP	rddVR3		Add	Ports			
FTP	rddVR5]		
RADIUS							
]]		

- G. Click **Apply** to commit the change.
- H. Click **Sync** to read-in the ports to the screen. You will see them show up in the *Bridge Information* table.

br0 (jw2) Configure Settings							\odot	×
	Current: LINK-UP PROBE-ERROR TSO UFO GSO GRO							A
Driver Info: Port Type: Bridge Driver: bridge(2.3) Bus: N/A								
			Port Configurab	les				
Enable			Spanning-Tree					
Set IF Down	n Down Aux-Mgt				Aging Time:	300	-	
Set MAC	DHCP-IPv6	☑ DHCP Release	DHCP Vendor ID:	None 💌	Bridge Priority:	32768	-	
Set TX Q Len	DHCP-IPv4	Secondary-IPs	DHCP Client ID:	None 💌	Max Age:	20	-	
Set MTU	DNS Servers:	BLANK	Peer IP:	NA	Hello Time:	2	-	
Set Bridge Info	IP Address:	0.0.0.0	Global IPv6:	AUTO	Forwarding Delay:	15	-	
	IP Mask:	0.0.0.0	Link IPv6:	AUTO				
	Gateway IP:	0.0.0.0	IPv6 GW:	AUTO				
	Alias:		MTU:	1500				
	MAC Addr:	0a:22:85:97:12:22	TX Q Len	1000				
	Rpt Timer:	medium (8 s) 🔻	WiFi Bridge:	NONE				=
	Brid	dge Information	Rem	ove Ports	-			
Services —	Configured P	rddVR1	s Add	Porto				
	rddVR3	rddVR3	Add	T OTES	_			
	radvR5	rddvR5						
								-
	Print <u>V</u> iew	Details P	robe Sync	<u>A</u> pply <u>O</u> K	<u>C</u> ancel			L
•				Synchronize with the cu Un-applied changes	rrent database as re will be lost.	ported by the	ne server	۰È

- I. Click **Cancel** to close the window.
- 3. Enable the WAN links in Netsmith

A. In the Netsmith window, click **Sync** to bring the changes into view



B. Right click on VRWL-1.1 and select Toggle WanLink

C. Repeat the toggle for the next two WanLinks



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