

Advanced AP Testing with LANforge (using Chamber View)

Goal: Provide VLANs and upstream router for AP, as well as stations for complete end-to-end testing.

In this test scenario a LANforge system will provide a DHCP server with 802.1 q vlans, provide NATed access to the internet for the AP, as well as create stations that will connect to the WiFi AP under test. The AP's Ethernet interface is connected to a LANforge Ethernet interface allowing the LANforge system to create both the wireless stations and Ethernet server. This is an advanced topic, so some steps will be glossed over. This requires LANforge version 5.4.3 or higher.

This scenario is built with these components





1. Click on the Chamber View button in the LANforge GUI to launch the Chamber View screen.

				Create/Modi	fy DUT							\checkmark \land \times
Name	TIP	Image file	NONE	Choose Image	×							
SW Info		HW Info	ECW5410	Model Number	ECW5410							
Serial Number		Serial port		API version	0							
WAN		LAN]								
SSID-1	testeap	Password-1		BSSID-1	90:3c:b3:94:48:18	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-2	testeap	Password-2		BSSID-2	90:3c:b3:94:48:59	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-3		Password-3		BSSID-3	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-4		Password-4		BSSID-4	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-5		Password-5		BSSID-5	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-6		Password-6		BSSID-6	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	802.11r	EAP-TTLS	EAP-PEAP
SSID-7		Password-7		BSSID-7	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	802.11r	EAP-TTLS	EAP-PEAP
SSID-8		Password-8		BSSID-8	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
EAP-ID		Mgt IP	0.0.0.0									
Num Ant Radio 1	0	Num Ant Radio 2	0	Num Ant Radio 3	0							
Active	Provides DHCP on LAN	DHCP Client	Provides DHCP on WAN	AP DUT								
Notes												

2. Configure an AP under test (DUT).

3. **Configure an Upstream (DUT).** This represents the upstream route for the AP's path to the Internet. The LANforge Ethernet port (eth2 in this example) that provides uplink to the internet must be configured with a static IP address (not via DHCP).

0				Create/Modif	y DUT							\sim \times
Name	upstream	Image file	NONE	Choose Image	×							
SW Info		HW Info		Model Number								
Serial Number		Serial port		API version	0							
WAN		LAN	192.168.200.1/24									
SSID-1		Password-1		BSSID-1	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-2		Password-2		BSSID-2	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-3		Password-3		BSSID-3	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-4		Password-4		BSSID-4	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-5		Password-5		BSSID-5	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-6		Password-6		BSSID-6	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-7		Password-7		BSSID-7	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
SSID-8		Password-8		BSSID-8	00:00:00:00:00:00	WEP	WPA	WPA2	WPA3	🗌 802.11r	EAP-TTLS	EAP-PEAP
EAP-ID		Mgt IP	0.0.0.0									
Num Ant Radio 1	0	Num Ant Radio 2	0	Num Ant Radio 3	0							
Active	Provides DHCP on LAN	DHCP Client	Provides DHCP on WAN	AP DUT								
Notes												
I												
				<u>Apply</u> <u>O</u> K	<u>C</u> ancel							

4. Profiles used in this scenario include VLAN.

Mode: Auto (0) Antennas: Default (0) Bandwidth: AUTO (0) Instances: 1 (1) Frequency: AUTO (-1 Mhz) Pattern: xx:xx:xx:*:*:xx SSID: Password: EAP-ID: Alias-Prefix: VLAN-ID: 100 WPA2 Open WEP WPA	Auto (0) AUTO (0)	-	Antennas: Instances:	Default (0)
Bandwidth: AUTO (0) Instances: 1 (1) Frequency: AUTO (-1 Mhz) Pattern: xxxx:x:*:xx SSID: Password: EAP-ID: Alias-Prefix: VLAN-ID: 100 WEP WPA WPA2 WPA3 802.11r 802.1x EAP-PEAP 802.1x EAP-PEAP BSS-Transition Enable NAT Restart DHCP on Connect	AUTO (0)	-	Instances:	1 (1)
Frequency: AUTO (-1 Mhz) Pattern: XXXXXX:*:*XX SSID: Password: Password: EAP-ID: Alias-Prefix: Image: Comparison of the comparison o				
SSID: Password: EAP-ID: Alias-Prefix: VLAN-ID: 100 DHCP Server Open WEP WPA WPA2 WPA3 802.11r 802.1x EAP-TTLS 802.1x EAP-PEAP BSS-Transition Enable NAT Restart DHCP on Connect	AUTO (-1 Mhz)	-	Pattern:	XXX:XXX:XXX:*:*:XXX
EAP-ID: Image: Alias-Prefix: VLAN-ID: 100 DHCP Server Open WEP WPA WPA2 WPA3 802.11r 802.1x EAP-TTLS 802.1x EAP-PEAP BSS-Transition Enable NAT Restart DHCP on Connect				
VLAN-ID: 100 DHCP Server Open WEP WPA WPA2 WPA3 802.11r 802.1x EAP-TTLS 802.1x EAP-PEAP BSS-Transition Enable NAT Restart DHCP on Connect			Password:	
Image: DHCP Server Open WEP WPA Image: WPA2 Image: WPA3 802.11r 802.1x EAP-TTLS Image: 802.1x EAP-PEAP Image: BSS-Transition Image: Enable NAT Restart DHCP on Connect			Alias-Prefix:	
WPA2 WPA3 802.11r 802.1x EAP-TTLS 802.1x EAP-PEAP BSS-Transition Enable NAT Restart DHCP on Connect	100			
□ 802.1x EAP-PEAP □ BSS-Transition □ Enable NAT ☑ Restart DHCP on Connect	🗌 Open		WEP	WPA
	WPA3		🗌 802.11r	802.1x EAP-TTLS
Notes:	BSS-Transition		Enable NAT	Restart DHCP on Connect
	[WPA3	WPA3 BSS-Transition	WPA3 802.11r BSS-Transition Enable NAT

5. Profiles used in this scenario include Upstream.

	Create	/Mo	dify Profile	\odot	×
Name:	upstream-dhcp		Type:	Upstream (Server) (4)	-
Mode:	Auto (0)		Antennas:	Default (0)	-
Bandwidth:	AUTO (0)	-	Instances:	1 (1)	-
Frequency:	AUTO (-1 Mhz)	-	Pattern:		
SSID:			Password:		
EAP-ID:			Alias-Prefix:		
VLAN-ID:					
DHCP Server	🗌 Open		WEP	WPA	
WPA2	WPA3		802.11r	802.1x EAP-TTLS	
802.1x EAP-PEAP	BSS-Transition		Enable NAT	Restart DHCP on Con	

6. Profiles used in this scenario include Uplink.

	Create	/Mo	dify Profile	\odot	
Name:	uplink-nat		Type:	Uplink (11)	•
Mode:	Auto (0)	-	Antennas:	Default (0)	-
Bandwidth:	AUTO (0)	-	Instances:	1(1)	
Frequency:	AUTO (-1 Mhz)	-	Pattern:		
SSID:			Password:		
EAP-ID:			Alias-Prefix:		
VLAN-ID:					
DHCP Server	🗌 Open		WEP	WPA .	
WPA2	WPA3		🗌 802.11r	802.1x EAP-TTLS	
802.1x EAP-PEAP	BSS-Transition		🗹 Enable NAT	Restart DHCP on Con	
Notes:					

7. Profiles used in this scenario include Stations.

	Create/	Mo	dify Profile	\odot \otimes \otimes
Name:	STA-AC		Туре:	WiFi Station (1)
Mode:	Auto (0)	-	Antennas:	Default (0) 🗸
Bandwidth:	AUTO (0)	-	Instances:	1 (1)
Frequency:	AUTO (-1 Mhz)	-	Pattern:	
SSID:			Password:	
EAP-ID:			Alias-Prefix:	
VLAN-ID:				
DHCP Server	Open		WEP	WPA
WPA2	WPA3		<mark>802.11</mark> 802.11	802.1x EAP-TTLS
802.1x EAP-PEAP	BSS-Transition		Enable NAT	Restart DHCP on Connect
Notes:				

8. **Create a Chamber View Scenario.** The first two rows specify the radios used for virtual stations. The third row is for the Upstream port. This is what the AP connects to with its WAN port. The Uplink-Nat row, associated with eth2, indicates that the eth2 port routes the APs traffic to the internet. The Maps-to portion of this line is important. The secondary port 'eth1' mapping associates this uplink port with the virtual-router that will hold eth2. The VLAN line creates an 802.1q VLAN on port eth1. Additional VLANs can be added as needed. The

final RDD line creates a virtual Ethernet pair and adds to the virtual router associated with eth1. The RDD port outside of the virtual router can be used as an upstream port that is able to generate traffic across eth1 and any VLANs created.

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Sce	nari	io T	ext (Dutput												
				Scenario Name tip-	vlar	is 🔻 [Dele	e <u>t</u> e Scenari	io	Create	e Pr	ofile Create Tr	affi	c <u>P</u> rofile	Add <u>R</u> ow	
Dup	Del	Resou	rce	Profile		Amount		Uses-1		Uses-2		Frequency		VLAN-ID	Maps To	
	×	1.1	-	STA: STA-AC	-	1(1)	-	wiphy0	-	AUTO	•	AUTO (-1 Mhz)	-	NA	DUT: TIP Radio-1	-
	×	1.1	-	STA: STA-AC	•	1 (1)	•	wiphyl	•	AUTO	Ŧ	AUTO (-1 Mhz)	-	NA	DUT: TIP Radio-2	-
	×	1.1	-	Upstream: upstream-dhcp	•	1 (1)	•	ethl	•	AUTO	•	AUTO (-1 Mhz)	-	NA	NA	-
	×	1.1	-	Uplink: uplink-nat	•	1 (1)	•	eth2	•	ethl	•	AUTO (-1 Mhz)	•	NA	DUT: upstream LAN 192.168.200.1/24	-
	×	1.1	-	Vlan: vlan-100	-	1 (1)	•	ethl	•	AUTO	•	AUTO (-1 Mhz)	-	100	NA	•
	×	1.1	-	RDD: rdd	-	1(1)	-	ethl	-	AUTO	•	AUTO (-1 Mhz)	-	NA	NA	-
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Bu	ild N	lew		<u>L</u> oad Scenario						te and Scenario					pply andand	el

9. Chamber-view screen with LANforge, AP, and Upstream. When satisfied with the scenario, click Build Scenario and the ports and virtual router will be created and configured.



10. **Netsmith virtual router.** The step above creates the Netsmith configuration. Eth2 is our uplink port, it enables NAT for anything routing out of it. Eth1 and the vlan eth1.100 provide DHCP leases to the DUT and DUT's stations. The rddVR1 port is a convenient 'upstream' port for generating traffic to/from the stations across the DUT. The IP addresses for eth1, eth1.100 and rddVR* are auto-created by the scenario building logic. The wlan0 and wlan1 are stations that can be associated with the AP.



11. At this point, your AP should be able to get a DHCP address from the LANforge virtual router and connect to the Internet. You can run various tests using the pull-down test selector in Chamber View, do manual testing, or launch fully automated scripted tests against the system.

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