LANforge WiFi Dual Virtual AP Setup with Limited Stations

**Goal:** Configure Two virtual APs with a maximum of ten stations each.

Requires at least a two-radio WiFIRE system such as a CT522, CT523 or CT525. This cookbook provides a basic setup to put a Virtual AP on each of two radios. Both APs are operating on separate channels but share the same SSID. We layout a basic constellation of APs in WPA2 mode that quickly fill up and force a station to search multiple channels for a free AP. This is the condition for issuing a Code 17 association refusal. This is not a roaming setup (Wireless Roaming/HS2.0 or 802.11r) because it is not configuring enterprise authentication or roaming specifications.

1. Configure two radios to serve the role of Virtual APs.
A. Start at the **Ports** tab. We will configure our second ethernet port as the upstream port for the virtual APs.

B. Highlight port eth1, and click **Modify**

C. Set the IP address to 10.26.1.3

D. and the netmask to 255.255.255.0

E. with a gateway address of the 10.26.1.2. (This gateway address matches the eth1 port of a separate system that hosts stations.

F. Click **OK**
B. In the **Ports** tab, select radios wiphy0, wiphy1, and click **Modify**. You will get two modify windows that you will want to place side by side.

A. Set the channel of wiphy0 to 36

B. and the channel of wiphy1 to 44

C. Click **OK** in both windows.

C. Time to create the first virtual AP. In the **Ports** tab, select wiphy0 and click **Create**.

A. Select WiFi VAP

B. Enter a **MAC address**: 00:10:26:02:00:01

C. **Quantity** is 1

D. **IP** of 10.26.2.1

E. Let’s use a typical **subnet mask**: 255.255.255.0

F. **Gateway IP** will be from eth1: 10.26.1.1

G. We will setup **WPA2** with the **SSID** **Limited-AP** and **Key/Phrase** **Limited-AP1**

H. Click **Apply** to commit.

I. Click **Cancel** to close the window.
D. Now craft a second virtual AP. In the **Ports** tab, select `wiphy1` and click **Create**.

A. Select **WIFI VAP**
B. Enter a **MAC address**: `00:10:26:03:00:01`
C. **Quantity** is 1
D. **IP** of `10.26.3.1`
E. **Gateway IP** will be from `10.26.1.3`
F. **SSID** limited-AP
G. We will setup **WPA2** with the **Key/Phrase** limited-AP1
H. Click **Apply** to commit.
I. Click **Cancel** to close the window.

E. We now have two virtual access points on two radios on separate channels. Each is on their own subnet. Now we limit the number of stations that can connect to them.
F. In the **Ports** tab, highlight endpoints vap0 and vap1 and click **Modify**

A. At the bottom of the **Port Configure Settings** window for vap0, change **Max-STA** to 10

B. Click **OK**

C. Repeat this for vap1

2. We now have two virtual access points that can both accept a small number of stations. We put them on different subnets because configuring DHCP on each VAP is simpler than adding a bridge device.

3. Let’s proceed to configuring **DHCP** for the 10.26.2.0/24 and 10.26.3.0/24 networks.

4. In the **Status** tab, click on **Netsmith**
A. Arranged your ports in the **Netsmith** windows and click Apply

B. Select **vap0** and right click, choose **Modify**
C. Enable the DHCP pool and the Next-hop for the port

A. Select DHCP
B. Set DHCP Lease Time to 120
C. Set DHCP Range Min to 10.26.2.10
D. Set DHCP Range Max to 10.26.2.250
E. Set Next-Hop to 10.26.1.3
F. Add Subnet 0.0.0.0/0
G. Click OK

D. Click Apply in the Netsmith window to commit the changes to LANforge. If you do not, these changes will disappear.

E. In the Netsmith window, select vap1 and right click, choose Modify
F. Configure the DHCP pool and the Next-hop for vap1

A. Select DHCP
B. Set DHCP Lease Time to 120
C. Set DHCP Range Min to 10.26.3.10
D. Set DHCP Range Max to 10.26.3.250
E. Set Next-Hop to 10.26.1.3
F. Add Subnet 0.0.0.0/0
G. Click OK

G. Click Apply in the Netsmith window to commit the changes to LANforge.

H. We will create a virtual router to allow upstream traffic to reach the virtual access points:

A. Right click in the Netsmith window and select New Router
B. You will see the Create/Modify Virtual Router window. We can use a default configuration.

C. Click OK to save a default router.

D. Drag the endpoints vap0, vap1 and eth1 into the virtual router, then click Apply in the Netsmith window.
E. We can verify outbound traffic using the following `ping` command. Open a terminal on the LANforge system and run `ping -I` 
10.26.3.1 10.26.1.2

```
root@kedtest:/home/lanforge - Terminal

root@kedtest:/home/lanforge ~
$ ping -I 10.26.3.1 10.26.1.2
PING 10.26.1.2 (10.26.1.2) from 10.26.3.1 : 56(84) bytes of data.
64 bytes from 10.26.1.2: icmp_seq=1 ttl=64 time=0.242 ms
64 bytes from 10.26.1.2: icmp_seq=2 ttl=64 time=0.288 ms
64 bytes from 10.26.1.2: icmp_seq=3 ttl=64 time=0.201 ms
64 bytes from 10.26.1.2: icmp_seq=4 ttl=64 time=0.290 ms
^C
--- 10.26.1.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2595ms
rtt min/avg/max/mdev = 0.242/0.275/0.289/0.019 ms
```

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