

First-time User Introduction to LANforge: Scripting and GUI

Goal: This outline is a rough and generic overview of our GUI. This outline, that references other Candela Technologies documentation on our website, briefly covers basic GUI tasks and traffic generation that may be shown to a new customer whom has never used the GUI before, without overloading them with great detail.



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2. Basic GUI Port Manager layout and introduction:

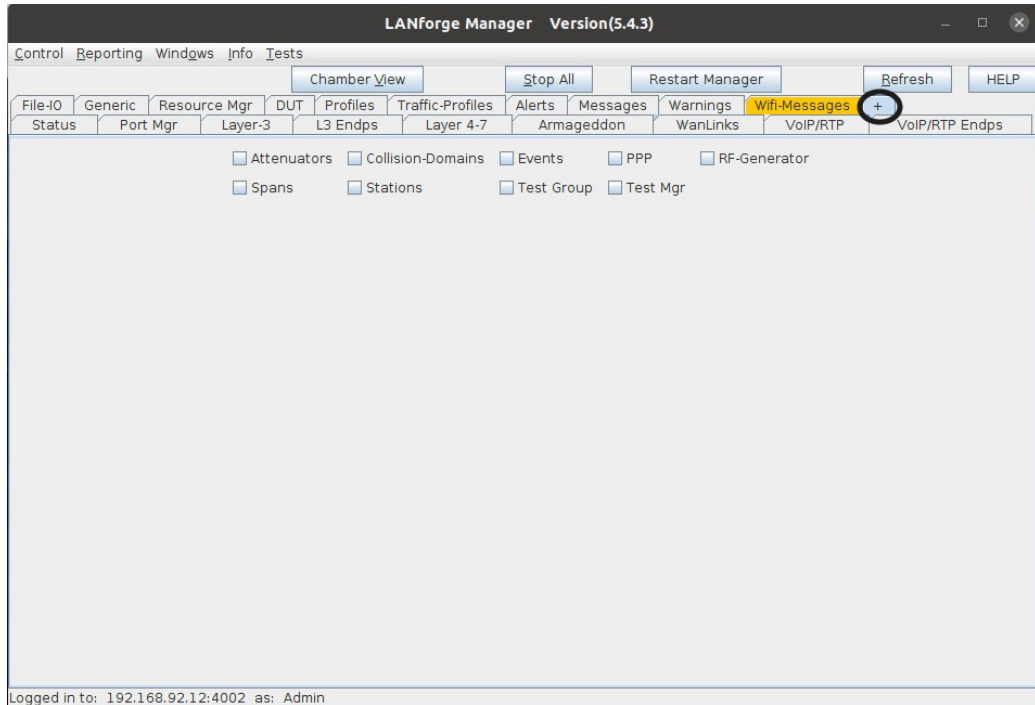
- After connecting the GUI, the interface will automatically open to the Status page. There are 28 tabs/pages that the GUI has, not including the Netsmith View and the Chamber View.

A. Editing the GUI tabs and Port Manager to display relevant information

- Upon opening the GUI, several default GUI tabs open as well. Depending on what upcoming WiFi testing must occur, more (or less) GUI tabs may need to be open than the ones defaulted.
- When running python scripts aimed to automate the GUI, the tabs that the actions in the script are occurring in must be displayed in the GUI (unless the user is running the GUI in headless mode).

A. To **display** tabs that are hidden:

- Click on the + tab under Refresh in the top right hand corner. Then, select which tabs to add to the GUI display.

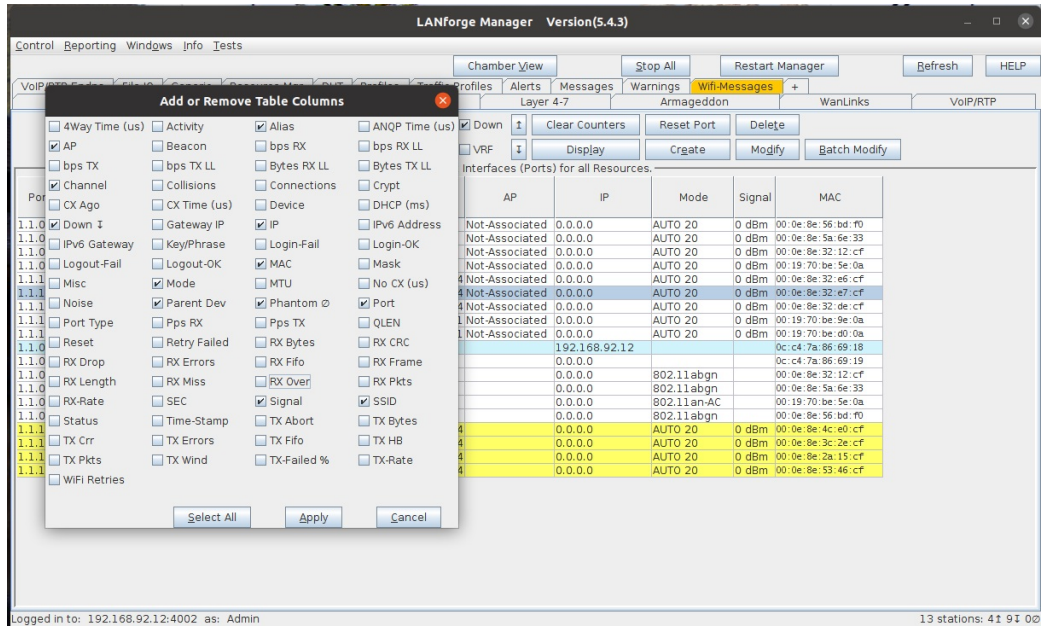


B. To **hide** tabs that are currently displayed:

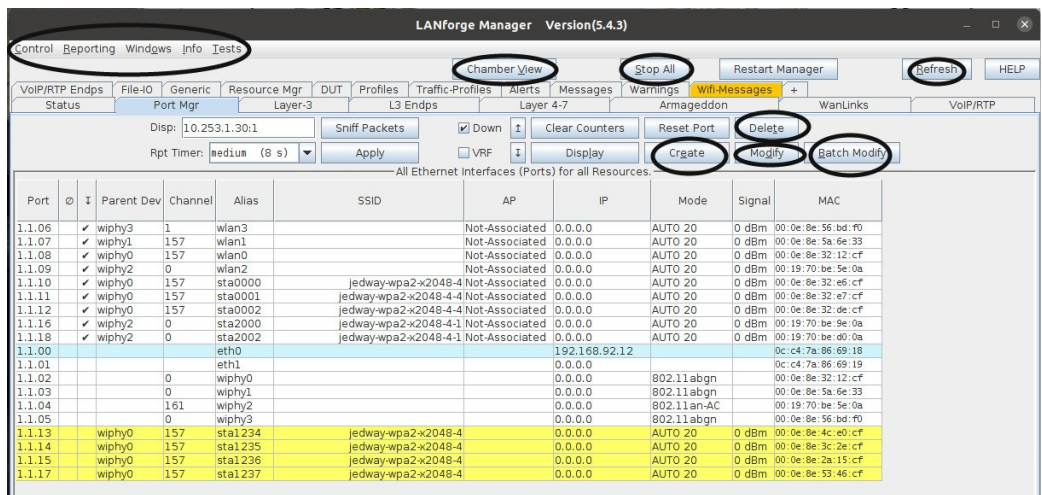
- Right-click the mouse on any tab that is aimed to remove and click Hide. This will remove the tab from the GUI interface currently and will be placed under the + category.

B. Customization of Column Display in the Port Manager

- A. In the second tab, Port Manager, comes downloaded with all the tab columns selected to be displayed (73 columns). To change which columns are selected and displayed, Right-click the mouse in any column space and select Add/Remove Table Columns. From that point, select the necessary columns wished to be displayed in the Port Manager.



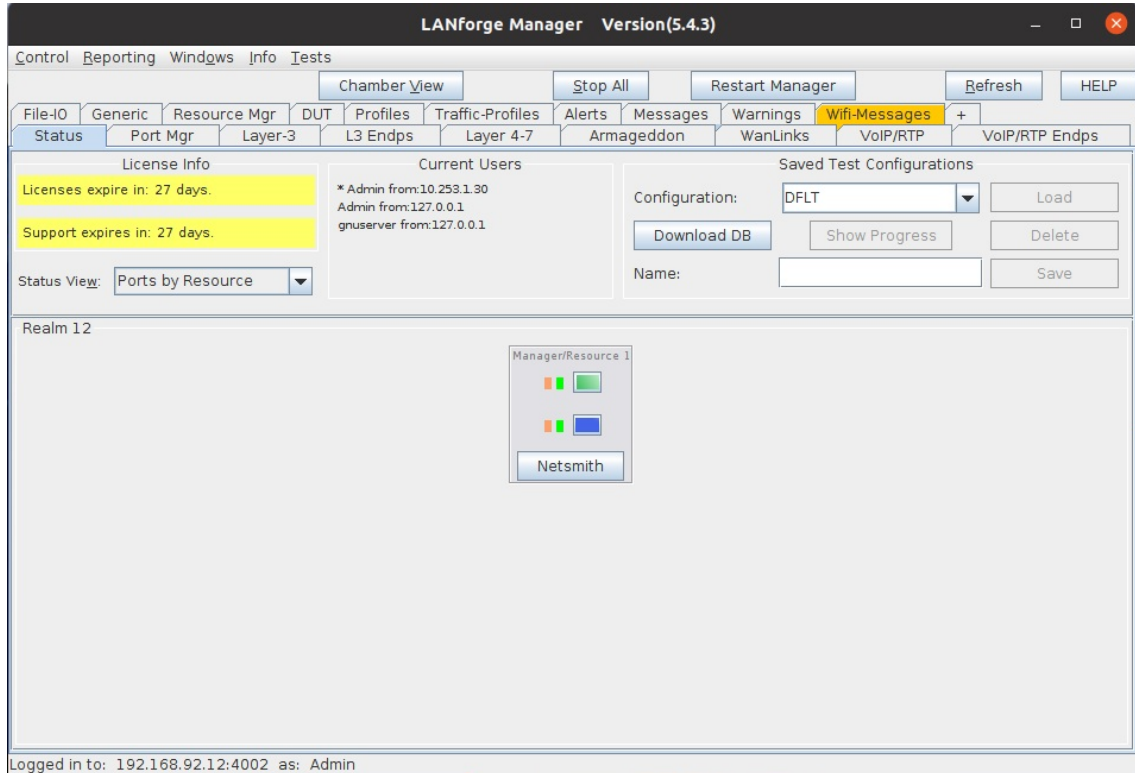
- B. After selecting the columns that wish to be displayed, Right-click the mouse again in the body/rows of the Port Manager and select Save-table Layout. This will make sure the changes don't revert the next time the GUI is opened and closed.
- C. After resizing, one can also Right-click the mouse in the body/rows of the Port Manager and select Auto-size, to auto-size the columns to make sure that all the words under each column are in vision at first glance.
- D. Tip: hot-keys are enabled throughout the entirety of the GUI. In some places in the GUI, there are lines underneath some letters in buttons. To use the keyboard shortcut for that button, press Alt + that letter underlined in the word to press the button. This also works for drop-down menus when the shortcut is enabled via an underlined letter in a word. **Note:** MAC users need to use key combo **ctrl+alt** + letter to do shortcuts. Circled below are some examples of hotkeys enabled.



3. LANforge GUI Tab Introduction

A. **Status** tab:

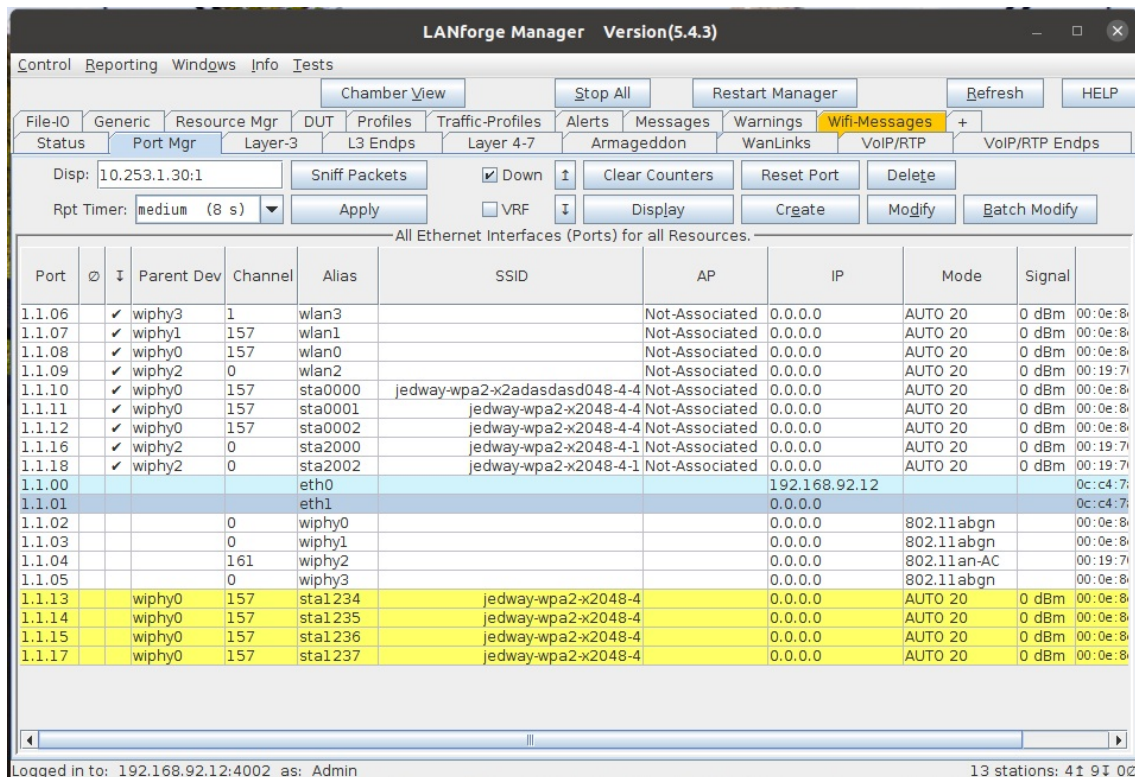
Please read the see also below (LANforge Manager) to read about the LANforge Status tab. This is where information about the server is typically stored, configurations of the GUI are able to be saved, and where the Netsmith is.



For more information see [Step 2: LANforge Manager](#)

B. **Port Mgr** tab:

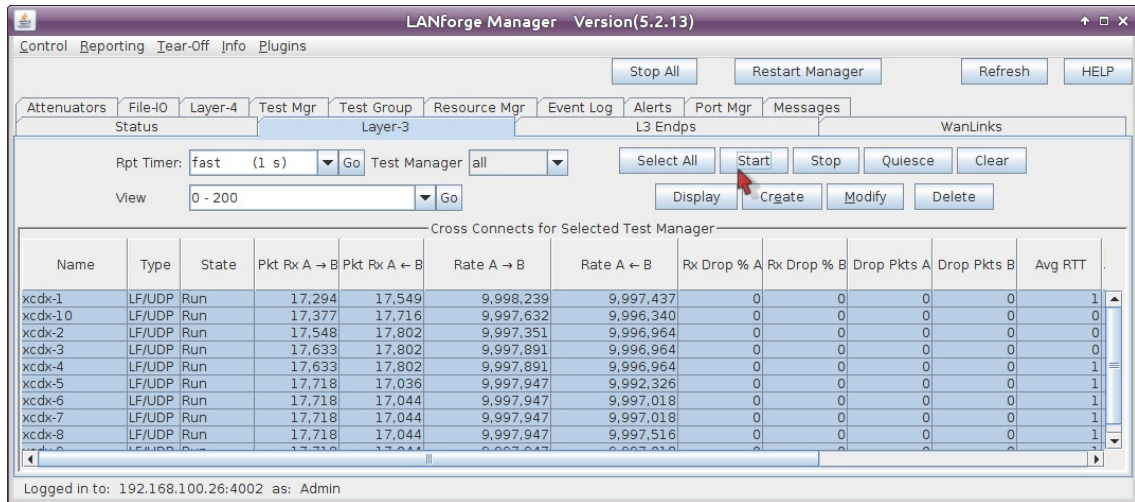
The Port Mgr tab is where all the ports and representations of the radios, wifi objects, and ethernet connections are located. The Port Mgr (or Port Manager) includes the location/appearance of all further MAC-VLANs, 802.1Q-VLANs, Redirects, Bridges, Bonds, GRE Tunnels, WiFi Stations, WiFi VAPs, WiFi Monitors and WiFi Virtual Radios. Please read more about the Port Mgr tab next to see-also below



For more information see [Ports \(Interfaces\)](#)

C. **Layer-3 tab, L3 Endps tab:**

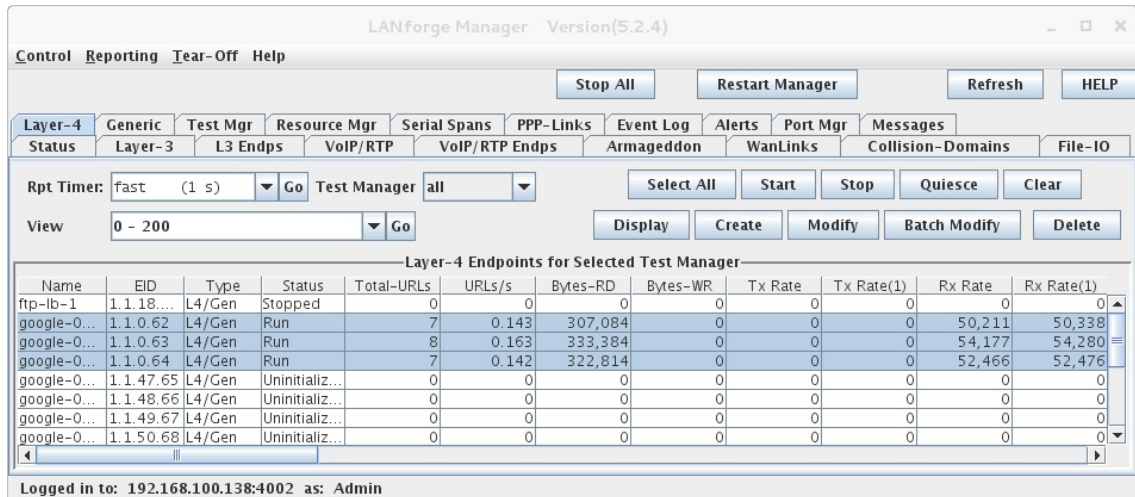
The Layer-3 tab are where Layer-3 WiFIRE traffic connections are made, started, stopped, modified, and displayed. Each cross-connects have 2 endpoints each. These endpoints and the traffic/data associated with them are found and elaborated under the L3 Endps tab in the GUI. Please visit the introduction to Layer-3 Cross-Connects, linked below, for a general overview.



For more information see [Layer-3 Cross-Connects \(FIRE\)](#)

D. **Layer 4-7 tab:**

The 'Layer 4-7' tab is currently where Layer-4 HTTP, HTTPS, FTP, FTPS, TFTP, SCP and SFTP endpoints are made. These are stateful protocols that will communicate properly with third-party servers. FTP, FTPS, TFTP, SCP and SFTP can upload and download, and the other protocols are only for downloading. The Layer 4-7 tab is used to manage Layer 4-7 endpoints.



For more information see [Layer 4-7](#)

E. Resource Mgr tab:

The Resource Mgr tab displays information on all Resources discovered by the LANforge server and provides the ability to perform system functions on selected machines (one or more). The definition of a resource is a LANforge machine that belongs to a numbered realm. The realm 255 is always a stand-alone realm while the realm resource 1 is the manager. The Resource Mgr tab displays LANforge servers in the same realm. LANforge systems have to be manually numbered, two LANforge systems with the same resource ID will confuse the manager resource. Please visit the link below for more information on the Resource Mgr

Name	EID	Type	Status	Total-URLs	URLs/s	Bytes-RD	Bytes-WR	Tx Rate	Tx Rate(1)	Rx Rate	Rx Rate(1)
ftp-lb-1	1.1.18....	L4/Gen	Stopped	0	0	0	0	0	0	0	0
google-0...	1.1.0.62	L4/Gen	Run	7	0.143	307,084	0	0	0	50,211	50,338
google-0...	1.1.0.63	L4/Gen	Run	8	0.163	333,384	0	0	0	54,177	54,280
google-0...	1.1.0.64	L4/Gen	Run	7	0.142	322,814	0	0	0	52,466	52,476
google-0...	1.1.47.65	L4/Gen	Uninitializ...	0	0	0	0	0	0	0	0
google-0...	1.1.48.66	L4/Gen	Uninitializ...	0	0	0	0	0	0	0	0
google-0...	1.1.49.67	L4/Gen	Uninitializ...	0	0	0	0	0	0	0	0
google-0...	1.1.50.68	L4/Gen	Uninitializ...	0	0	0	0	0	0	0	0

For more information see [Resources \(Data Generator Machines\)](#)

F. Messages, Warnings, Wifi-Messages Mgr tab:

The Messages, Warnings and Wifi-Messages tab are all tabs that should be open at all times. All these tabs contain important information about the LANforge GUI Interface. The Messages tab displays detailed CLI command feedback from the LANforge Server. When scripting, command failures can be shown here. If any one of these 3 tabs are highlighted/have a yellow background in the tab bar, there is a new update in that yellowed tab. For information on any other tabs, besides the ones mentioned above, please visit the link below LANforge-GUI User Guide: Tab Display Preferences for further tab descriptions.

```
Welcome to the LANforge GUI Manager.
This page will contain miscellaneous information from the server.

Tue Dec 29 15:33:02 PST 2020: Welcome to LANforge. Enter 'help' for more information.
Tue Dec 29 15:33:02 PST 2020:
Tue Dec 29 15:33:02 PST 2020: *** LICENSE INFORMATION

Version: 5.4.3 Compiled on: Wed Dec 2 11:01:16 PST 2020
By: greearb On machine: Linux v-f24-64 4.10.17-100.fc24.x86_64 x86_64 x86_64
Platform: Linux 64-bit

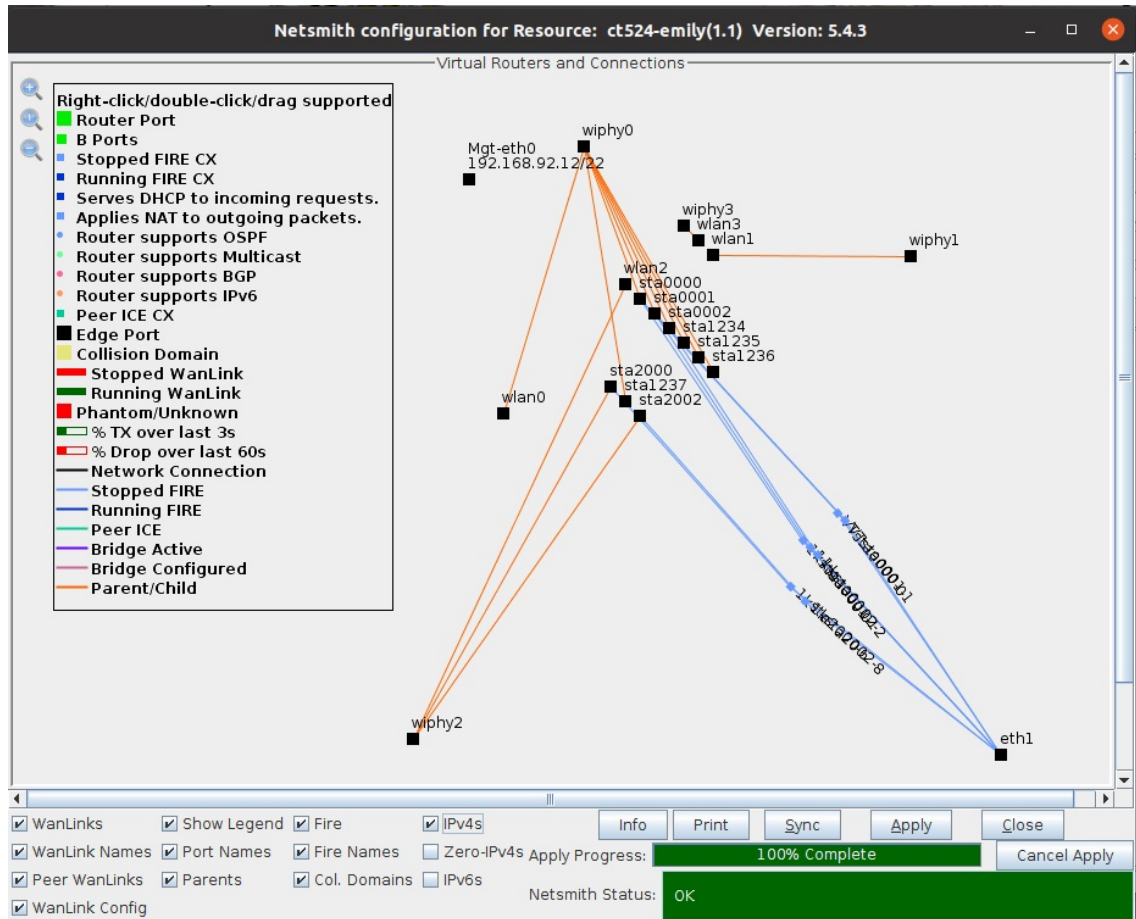
Licenses: Shelves: 2 Cards: 10 Ports: 10000 Active Ports: 64000 Fire-CX: 64000
WanLinks: 66000 WL-2m: 66000 WL-45m: 6600 WL-OEM100: 0 WL-155m: 6600 WL-1g: 60 WL-10g: 16
WanPaths: 6400 Armageddon: 6600 VOIP: 6400 Secondary-IPs: 64000
80211AC-Radios: 64000 TR-398: 0
RFGEN: 0
LANforge Licenses expire in: 32 days.
Current use: Ports: 1 IPs: 0 Fire-CX: 0 Armageddon: 0 VOIP: 0
WL-2m: 0 WL-45m: 0 WL-OEM: 0 WL-155m: 0 WL-16: 0 WL-10G: 0
WanPaths: 0 80211AC-Radios: 0
LANforge Support and Software Upgrades expire in: 32 days.
Tue Dec 29 15:33:02 PST 2020:
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 252 Cmd: 'show_clients'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 192 Cmd: 'who'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 3549 Cmd: 'show_dbs'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 0 Cmd: 'license 'NA' 'yes'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 0 Cmd: 'show_vrf 'ALL' 'ALL'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 0 Cmd: 'show_vrcx 'ALL' 'ALL'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 252 Cmd: 'show_clients'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 192 Cmd: 'who'
Tue Dec 29 15:33:02 PST 2020: >>-RSLT: 0 Cmd: 'show_alerts'
Tue Dec 29 15:33:02 PST 2020: New Setting: IsBrief: 1
Tue Dec 29 15:33:02 PST 2020: Push_Endp_Rpts flag set to: 0
Tue Dec 29 15:33:02 PST 2020: Push_All_Rpts flag set to: 0
Tue Dec 29 15:37:57 PST 2020: Adding new endpoint.
Tue Dec 29 15:37:57 PST 2020: Setting Rate: V1sta0000-0-A min: 256000 max: 0
Tue Dec 29 15:37:57 PST 2020: Setting Payload Size: Shelf: 1 Card: 1 Port: 65535 Endpoint: 142 Type: LANFORGE_UDP min: -1 max: 0 Checksum: NA
Tue Dec 29 15:37:57 PST 2020: Endpoint values have been set.
Tue Dec 29 15:37:57 PST 2020: Adding new endpoint.
Tue Dec 29 15:37:57 PST 2020: Setting Rate: V1sta0000-0-A min: 256000 max: 0
Tue Dec 29 15:37:57 PST 2020: Setting Payload Size: Shelf: 1 Card: 1 Port: 65535 Endpoint: 142 Type: LANFORGE_UDP min: -1 max: 0 Checksum: NA
Tue Dec 29 15:37:57 PST 2020: Endpoint values have been set.

Input:
```

For more information see [Tab Display Preferences](#)

G. Using Netsmith tab:

In the LANforge GUI, on the Status page there is a small button named Netsmith. It is a tool used to help visualize the relationships of ports and cross connects defined in the resource you are viewing. There is a separate Netsmith view for each LANforge resource in your realm. There are several ways to edit the GUI objects in Netsmith, display the different up-to-date connections in the GUI, and what is shown in Netsmith. Please visit the link below to understand how to use Netsmith in greater detail.



For more information see [Netsmith: Virtual Network Configurator](#)

4. Station Creation:

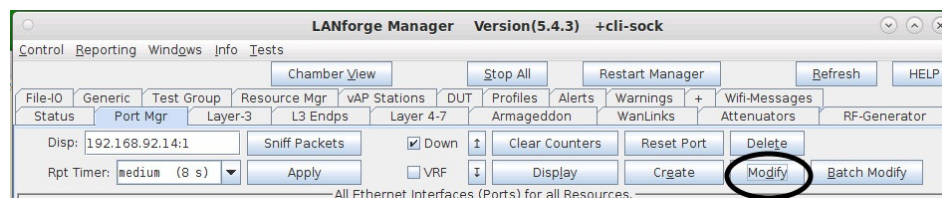
Please visit Step 1 of the following cookbook below to learn how to Create a Station in the LANforge-GUI. Please visit the link at the bottom of this section on how to script a station in the GUI.

A. Searching for Active SSIDS & Connecting to a Particular SSID:

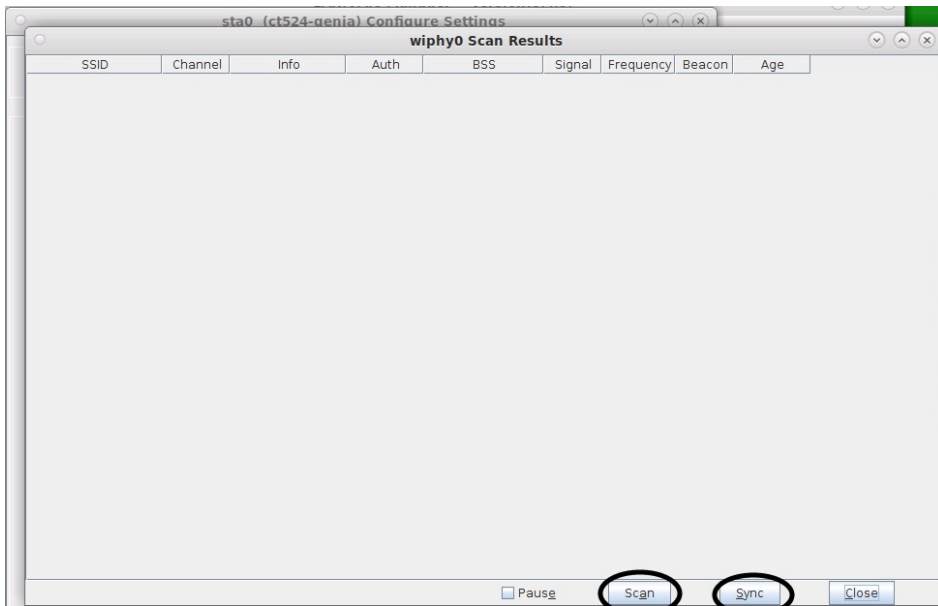
Often times, there may be an active network around, but the LANforge GUI does not have the network registered as "able to be connected to". To allow this network to be recognized, one must **scan** in the GUI object's settings to make sure that the object sees this network.

See below for an example:

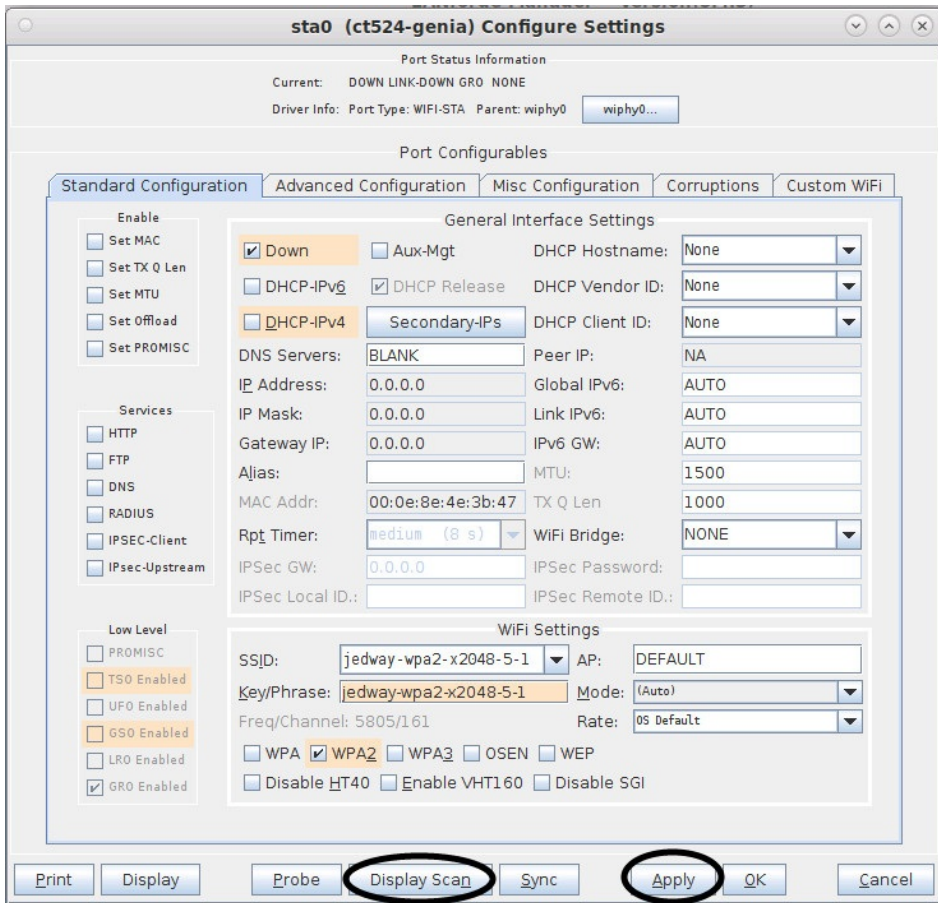
- I. Double-click or select Modify on a station in the Port Mgr to pop up Configure Settings window.



- II. However, the GUI isn't registering that as a proper network because selecting Display Scan, Scan, and Sync in the Configure Settings shows no networks are found and discovered in the GUI.

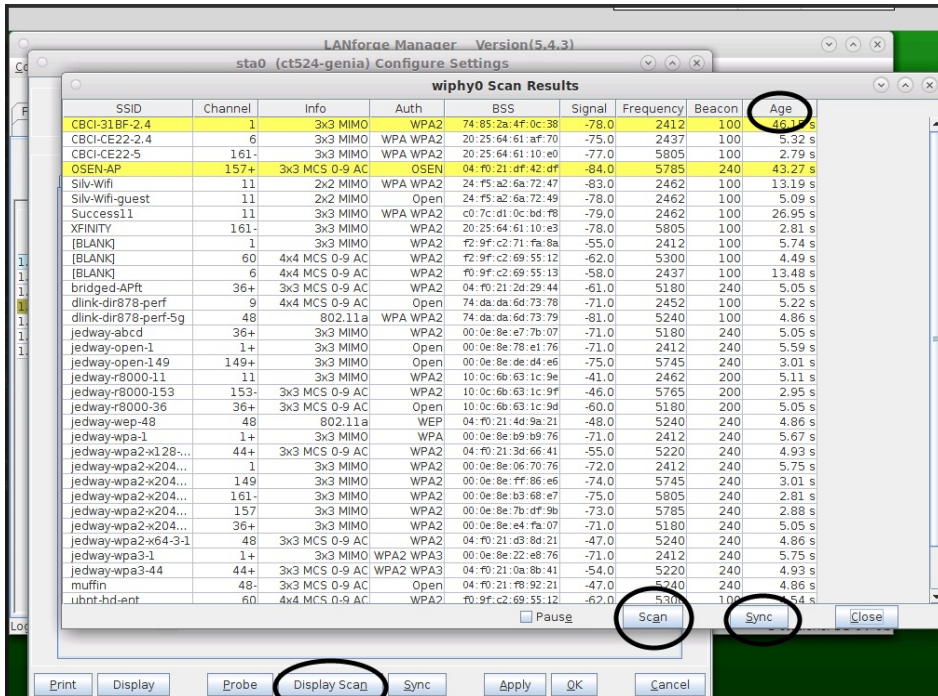


- III. Type in the desired SSID, Key/Phrase, and select the appropriate Security to be used (WPA/WPA2/WPA3... etc) located within the WiFi Settings panel (shown below). Select Apply. Apply will trigger the LANforge GUI to start searching for currently active SSIDs.

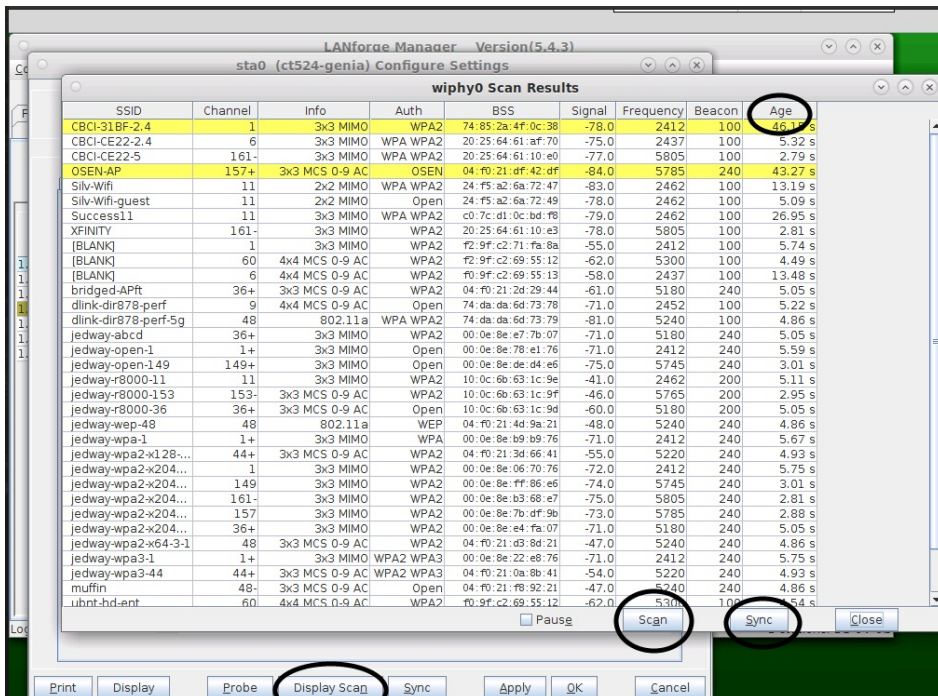


IV. Then, select Display Scan in the bottom bar, as highlighted in the picture above. Something similar to the Window in the picture below will pop up. Then click on Scan (circled below) and Sync. Now, the most recent active networks should be scanned and displayed in a similar window to below by the GUI. The example below indicates that the radio (wiphy0) has now found current, active networks. Also, the far right corner of the table displays the age of the networks, so if the Age is too old after the recent scanning, it might be time to restart the network or pick a new network.

Note: If there are no scan results, the radio is probably set to a specific channel. The radio channel configuration may need to be changed or the object must be created on a different radio.



V. Now, close the two windows opened previously by selecting Close. Go back to the Port Mgr tab and the desired object to be connected should be connected to that SSID. In Wifi-Messages, there should have also been a message saying that sta0 and wiphy0 are scanning for network SSIDs. This is another indication of the LANforge scanning software retrieving local SSIDs. LANforge now concludes that it can connect to the SSID by acquiring an AP and IP in the Port Mgr (see circled below).



For more information see [Station Creation : Step 1](#)

For more information see [Scripting a Station in the GUI \(Step 3\)](#)

5. **MAC-VLAN Creation:**

Creating a MAC-VLAN on the LANforge-GUI is done in the Port Mgr.

Please visit **Step 3** of the following cookbook on how to create a MAC-VLAN from the GUI. The following link will inform how to program the GUI to create a MAC-VLAN

For more information see [Creating a MAC-VLAN in the GUI\(Step 3\)](#)

For more information see [Scripting a MAC-VLAN in the GUI](#)

6. **Bridge Creation:**

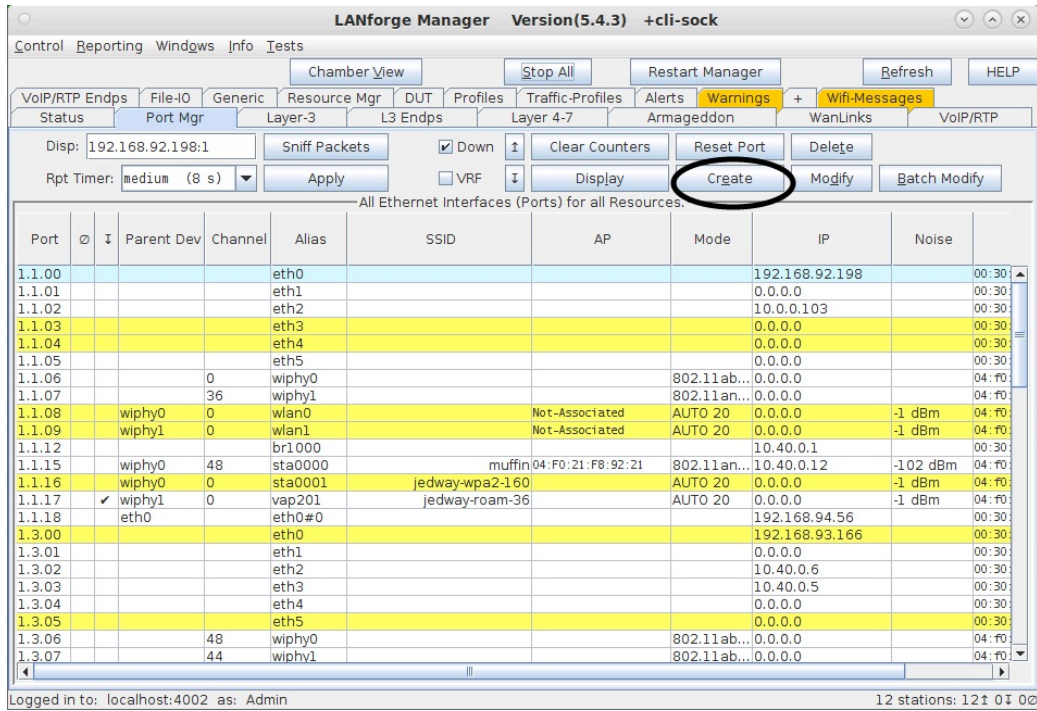
Creating a Bridge on the LANforge-GUI is done in the Port Mgr.

Please visit **Step 2** of the following cookbook on how to create a Bridge in Netsmith.

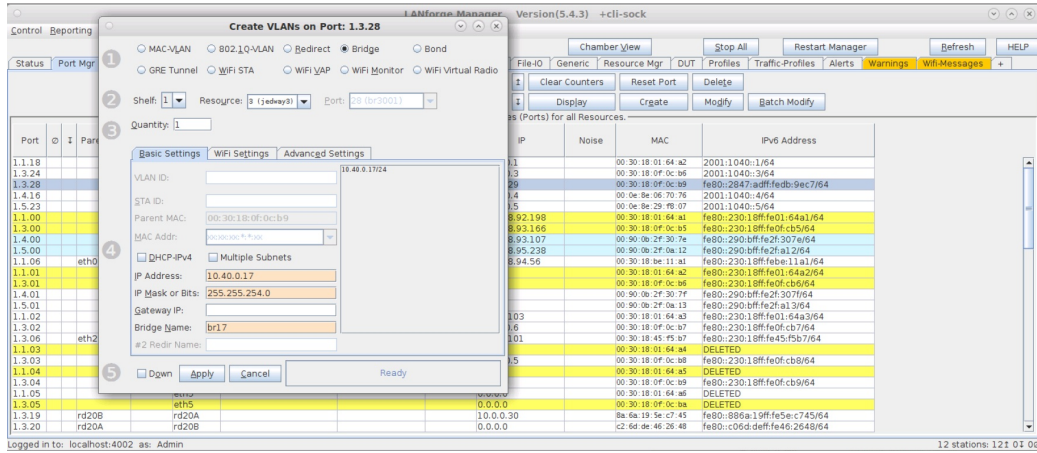
For more information see [Creating a Bridge in Netsmith \(Step 2\)](#)

A. Create a bridge in Port Mgr:

A. Click on the Port Mgr tab and Create in the top right corner.



B. After a new window pops up, Select Bridge in Step 1 of the new window. In Step 2, select the Shelf and Resource the bridge should use (from the drop down menus in each slot). Step 3, select the Quantity of the bridges to be created. In Step 4, under the Basic Settings tab, check the box if the bridge should be enabling DHCP-IPv4. If DHCP-IPv4 isn't enabled, give the bridge an IP Address and IP Mask. Lastly, give the bridge a name. Click Apply and Cancel. The bridge is now in the Port Mgr.



B. Adding a port to an existing bridge in Port Mgr:

LANforge Manager Version(5.4.3)

Control Reporting Windows Info Tests

Chamber View Stop All Restart Manager Refresh HELP

RF-Generator File-IO Generic Test Group Resource Mgr vAP Stations DUT Profiles Alerts Warnings +

Status Port Mgr Layer-3 L3 Endps Layer 4-7 Armageddon WanLinks Attenuators

Disp: 192.168.92.14:1 Sniff Packets Down Clear Counters Reset Port Delete

Rpt Timer: medium (8 s) Apply VRF Display Create Modify Batch Modify

All Ethernet Interfaces (Ports) for all Resources.

Port	Phantom	Down	IP	Alias	Parent Dev	AP	Channel	Mode	SSID	MAC
1.1.0			192.168....	eth0						0c:c4:7a:...
1.1.1			10.40.11....	eth1						0c:c4:7a:...
1.1.10			0.0.0.0	wiphy3			0	802.11an...		00:19:70:...
1.1.2			10.40.9.1...	sta0	wiphy0	00:0E:8E:...	157	802.11an...	jedway-w...	00:0e:8e:...
1.1.3			0.0.0.0	wiphy0			0	802.11ab...		00:0e:8e:...
1.1.4			10.40.0.17	br17						a6:50:b2:...
1.1.6			0.0.0.0	wiphy1			0	802.11ab...		00:0e:8e:...
1.1.8			0.0.0.0	wiphy2			0	802.11ab...		04:f0:21:...

Logged in to: localhost:4002 as: Admin 1 stations: 1 1 0 0

- A. To add a port, double click on the bridge you created or click once on the bridge in Port Mgr and select Modify. A window Configure Settings should pop up. At the bottom of the window, there is a small section that allows addition of ports.

br17 (ct524-genia) Configure Settings

Port Status Information
Current: LINK-DOWN PROBE-ERROR TSO GSO GRO
Driver Info: Port Type: Bridge Driver: bridge(2.3) Bus: N/A

Port Configurables

Enable

- Set MAC
- Set TX Q Len
- Set MTU
- Set Offload
- Set Bridge Info

Services

- HTTP
- FTP
- DNS
- RADIUS
- IPSEC-Client
- IPsec-Upstream

General Interface Settings

Down Aux-Mgt DHCP Release DHCP-IPv6 DHCP-IPv4

DNS Servers: BLANK

IP Address: 10.40.0.17 IP Mask: 255.255.254.0 Gateway IP: 0.0.0.0 Alias: MAC Addr: 00:00:00:00:00:00 Rpt Timer: medium (8 s) IPsec GW: 0.0.0.0 IPsec Local ID:

Secondary-IPs

DHCP Hostname: None DHCP Vendor ID: None DHCP Client ID: None Peer IP: NA Global IPv6: AUTO Link IPv6: AUTO IPv6 GW: AUTO MTU: 1500 TX Q Len: 1000 WiFi Bridge: NONE

Spanning-Tree

Aging Time: 300 Bridge Priority: 32768 Max Age: 20 Hello Time: 2 Forwarding Delay: 15

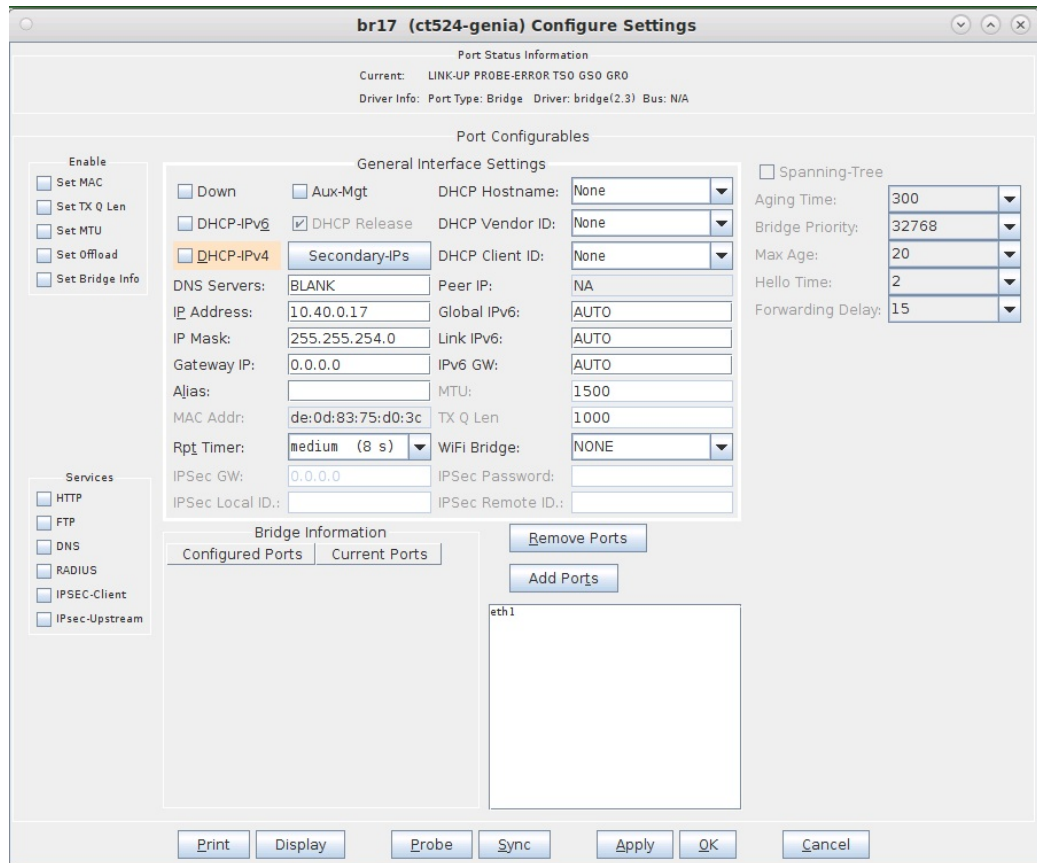
Bridge Information

Configured Ports Current Ports

Remove Ports Add Ports

Print Display Probe Sync Apply QK Cancel

- B. In the text box under the Add Ports button (circled below), type in the port name (ex: vap123, eth1, sta000) intended to be added to the bridge. In this example, eth1 to be added to br17.



- C. Select Add Ports (circled). This button will now categorize eth1 as a Configured Port. Then, select Apply and Sync to now see eth1 also be listed under Current Ports. Lastly, click OK to close the window. If the port inputted into the text box does not move to the Current Ports category after selecting Sync, this may mean that the port is already in a configuration that prevents it from being in a bridge (i.e. it may already be in a bridge...etc). To learn how to script a bridge in the GUI, please visit the link below.

For more information see [Scripting the GUI to create a Bridge \(Step 6\)](#)

7. Virtual Creation (VAP):

Please visit **Step 1** of the following cookbook to learn how to create a Virtual AP in the GUI. For more information see [Scripting the GUI to create a VAP \(Step 7\)](#)

8. Monitor Creation:

Please visit **Step 1** of the following cookbook to learn how to create a Monitor in the GUI. For more information see [Scripting the GUI to create a Monitor](#)

9. Layer 3 Creation:

Layer-3 Cross-Connects represent a stream of data flowing through the system under test. A Cross-Connect (CX) is composed of two Endpoints, each of which is associated with a particular Port (physical or virtual interface). The Layer-3 tab displays connections 0-200 by default.

Separated below are important sections to getting to know the Layer 3 tab:

For more information see [How to Create and Modify Cross-Connects & Cross-Connect Information](#)

For more information see [Interpreting the Layer-3 Endps tab: Layer-3 Cross Connect Endpoints & Batch-Creating Cross-Connects](#)

For more information see [Scripting a Layer-3 Cross Connect \(Step 8\)](#)

10. Layer 4-7 Traffic Generation:

The Layer 4-7 traffic is supposed to emulate curl commands. Endpoints can be created with the following protocols: HTTP, HTTPS, FTP, FTPS, TFTP, SCP and SFTP. These are stateful protocols that will communicate properly with third-party servers. FTP, FTPS, TFTP, SCP and SFTP can upload and download, and the other protocols are only for downloading. The Layer 4-7 tab is used to manage Layer 4-7 endpoints.

Separated below are important sections to getting to know the Layer 4-7 tab:

For more information see [Creating and Modifying Layer 4-7 Endpoints](#), [L4 Endpoint Information](#), [Batch-Create Layer 4-7 Endpoints](#)

For more information see [Layer 4-7 Endpoint Display](#)

For more information see [Setting up a Simple HTTP Get/Download in the GUI](#)

For more information see [Scripting the GUI to create Layer 4-7 traffic \(Step 9\)](#)

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