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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.

1. **Table of Contents**

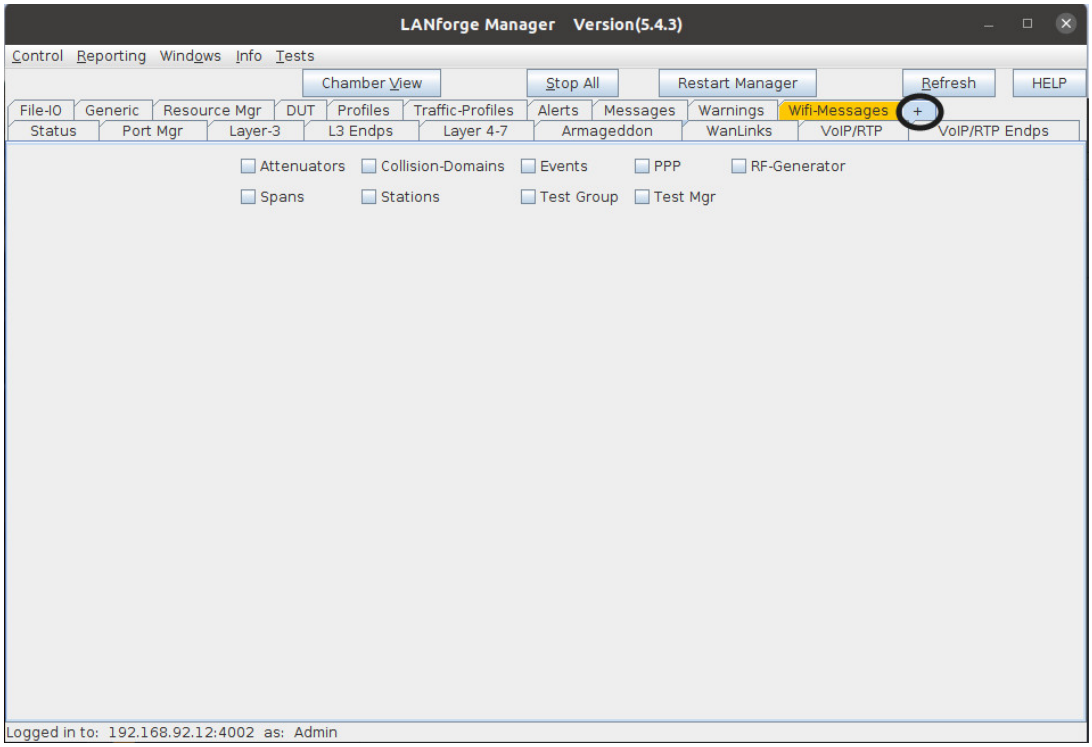
2. **Basic GUI Port Manager layout and introduction:**
   - After connecting the GUI, the interface will automatically open to the *Status* page. There are 28 tabs/pages that the GUI has, not including the *Netsmith* View and the *Chamber View*.

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 occuring 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.

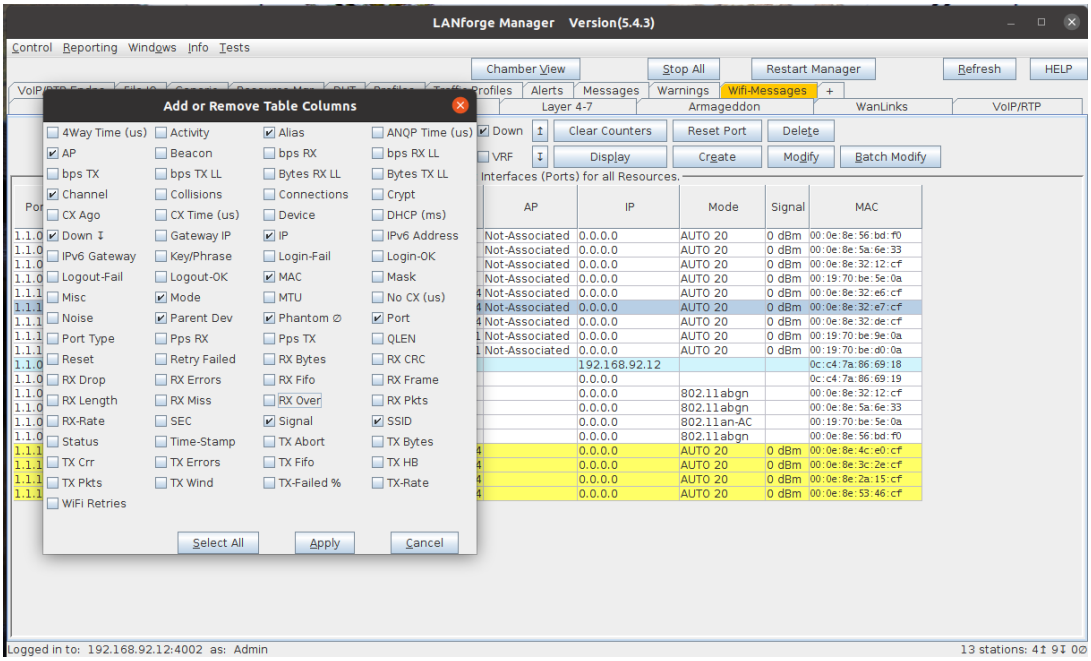


B. To **hide** tabs that are currently displayed:

- Right-click the mouse on any tab that is aimed to remove and click *Hide*. This is 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***

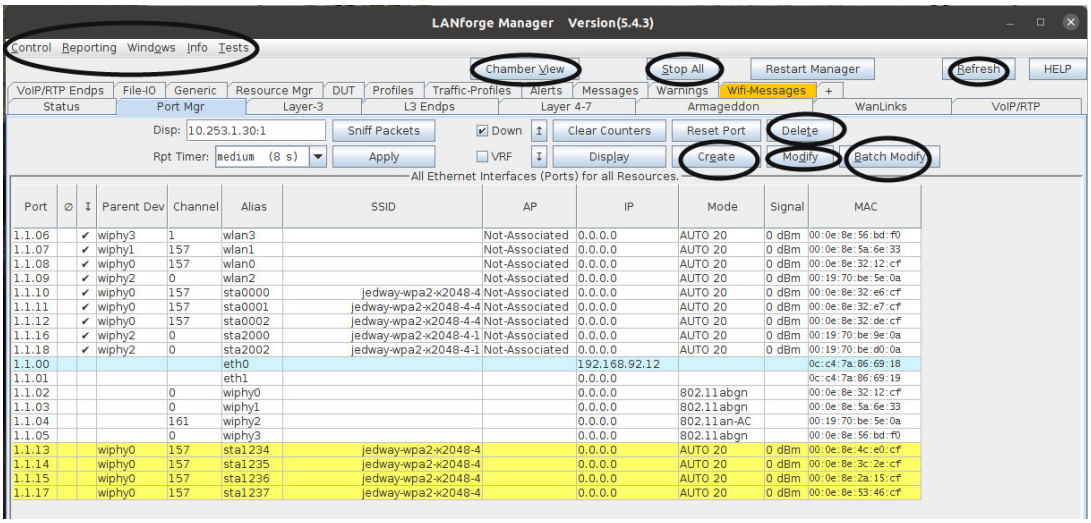
A. In the second tab, *Port Manager*, comes downloaded with all the tab columns selected to be displayed (73 columns). To change which columns are selected and displayed, Right-click the mouse in any column space and select *Add/Remove Table Columns*. From that point, select the necessary columns wished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

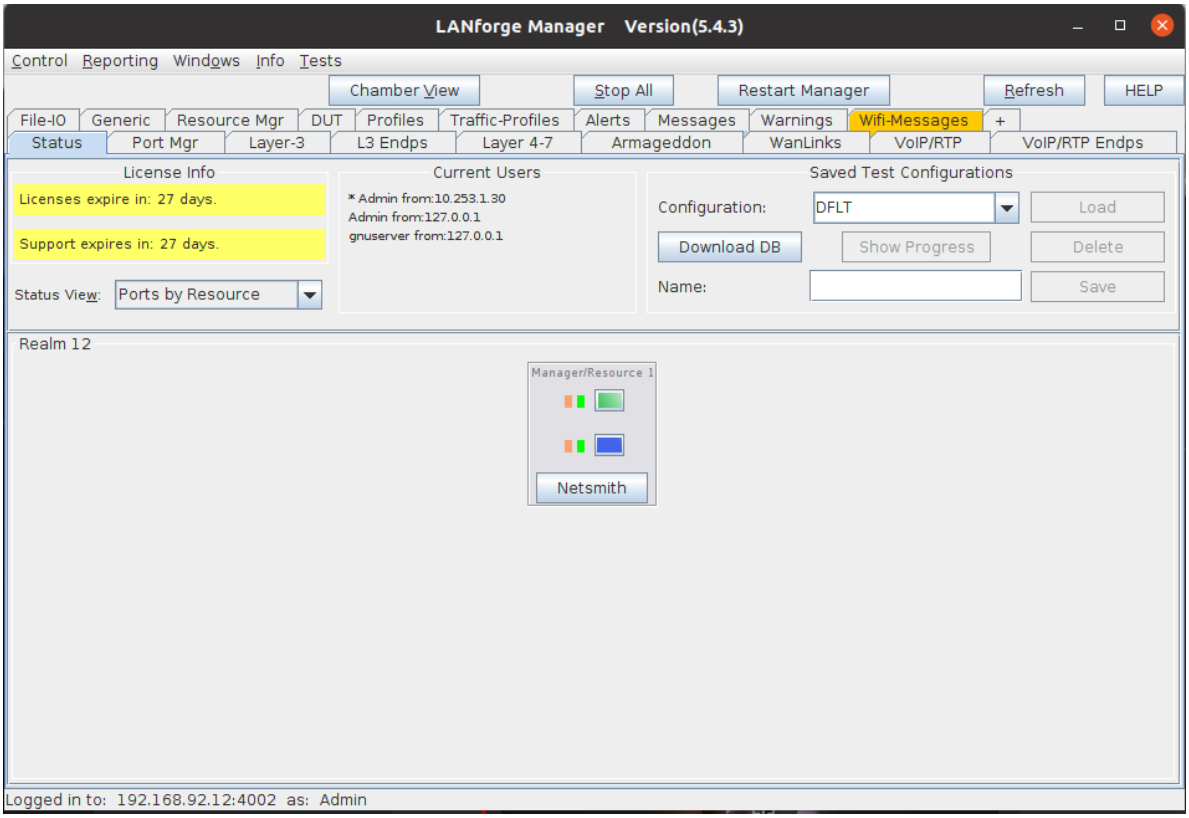
D. Tip: hot-keys are enabled throughout the entirety of the GUI. In some places in the GUI, there are lines underneath some letters in buttons. To use the keyboard shortcut for that button, press Alt + that letter underlined in the word to press the button. This also works for drop-down menus when the shortcut is enabled via an underlined letter in a word. **Note:** MAC users need to use key combo ctl+alt + letter to do shortcuts. Circled below are some examples of hotkeys enabled.



3. **LANforge GUI Tab Introduction**

A. **Status** tab:

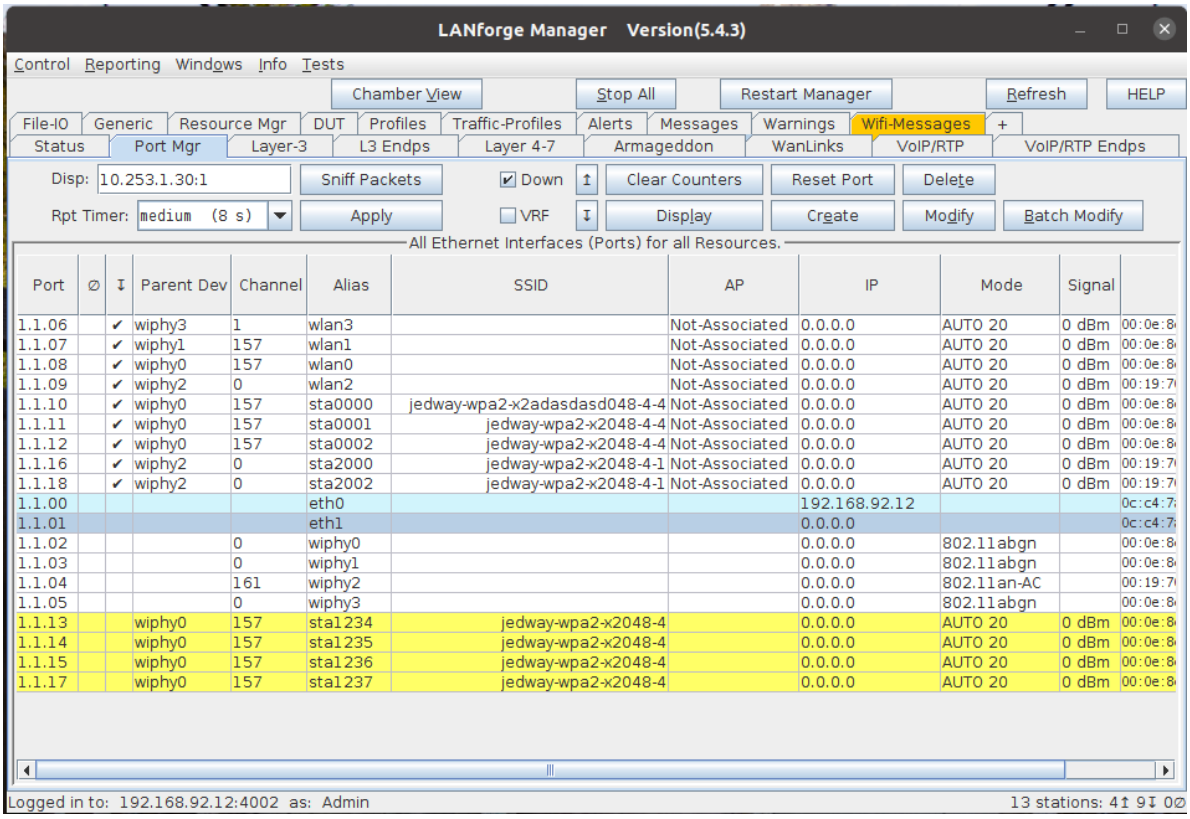
Please read the see also below (LANforge Manager) to read about the LANforge Status tab. This is where information about the server is typically stored, configurations of the GUI are able to be saved, and where the *Netsmith* is.



For more information see Step 2: LANforge Manager

B. **Port Mgr** tab:

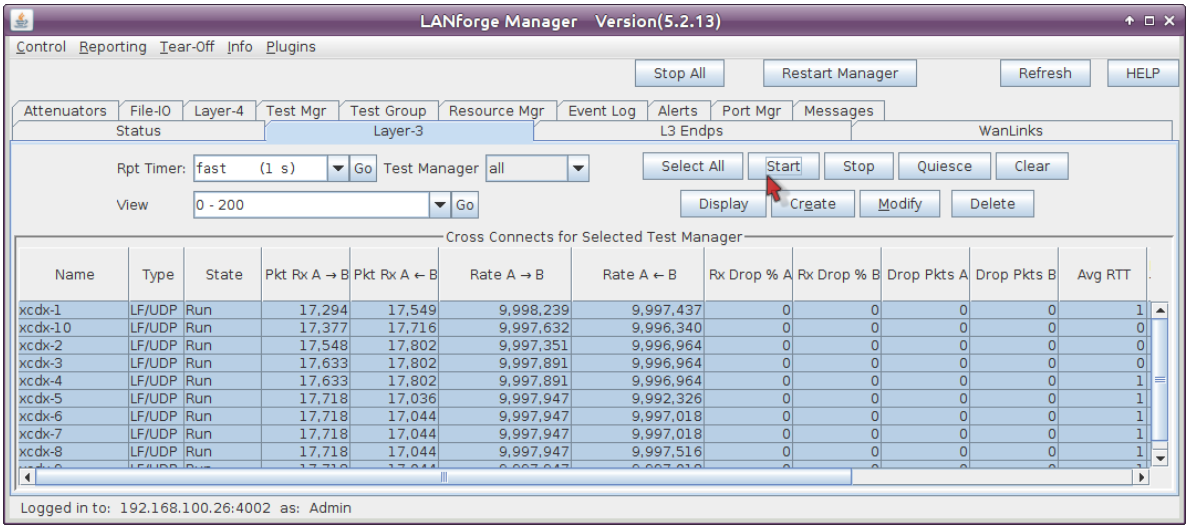
The *Port Mgr* tab is where all the ports and representations of the radios, wifi objects, and ethernet connections are located. The *Port Mgr* (or *Port Manager*) includes the location/appearance of all further MAC-VLANs, 802.1Q-VLANs, Redirects, Bridges, Bonds, GRE Tunnels, WiFi Stations, WiFi VAPs, 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:

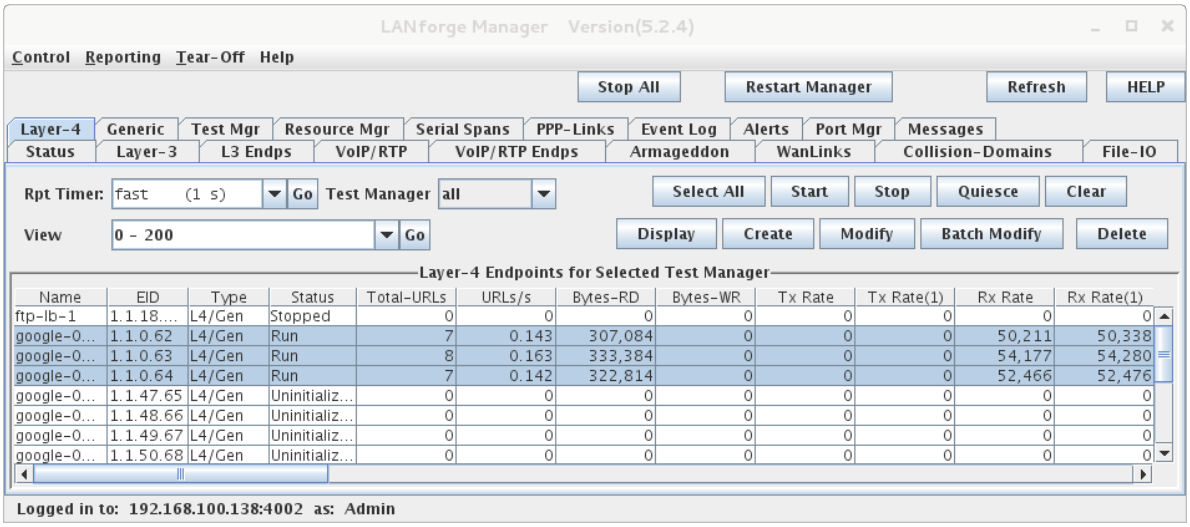
The *Layer-3* tab are where Layer-3 WiFIRE traffic connections are made, started, stopped, modified, and displayed. Each cross-connects have 2 endpoints each. These endpoints and the traffic/data associated with them are found and elaborated under the *L3 Endps* tab in the GUI. Please visit the introduction 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:

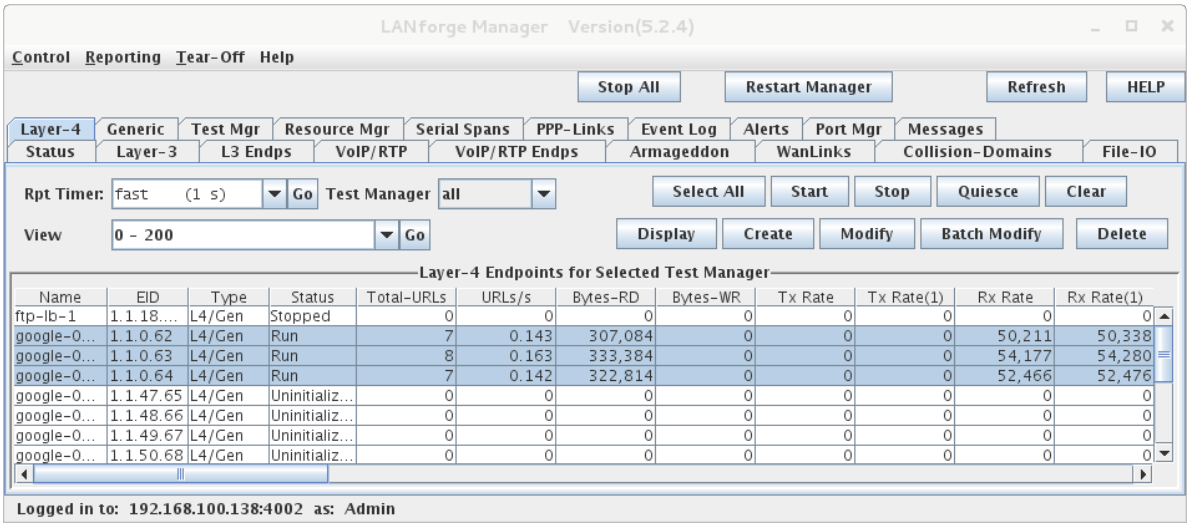
The 'Layer 4-7' tab is currently where *Layer-4* HTTP, HTTPS, FTP, FTPS, TFTP, SCP and SFTP endpoints are made. These are stateful protocols that will communicate properly with third-party servers. FTP, FTPS, TFTP, SCP and SFTP can upload and download, and the other protocols are only for downloading.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



For more information see Layer 4-7

E. **Resource Mgr** tab:

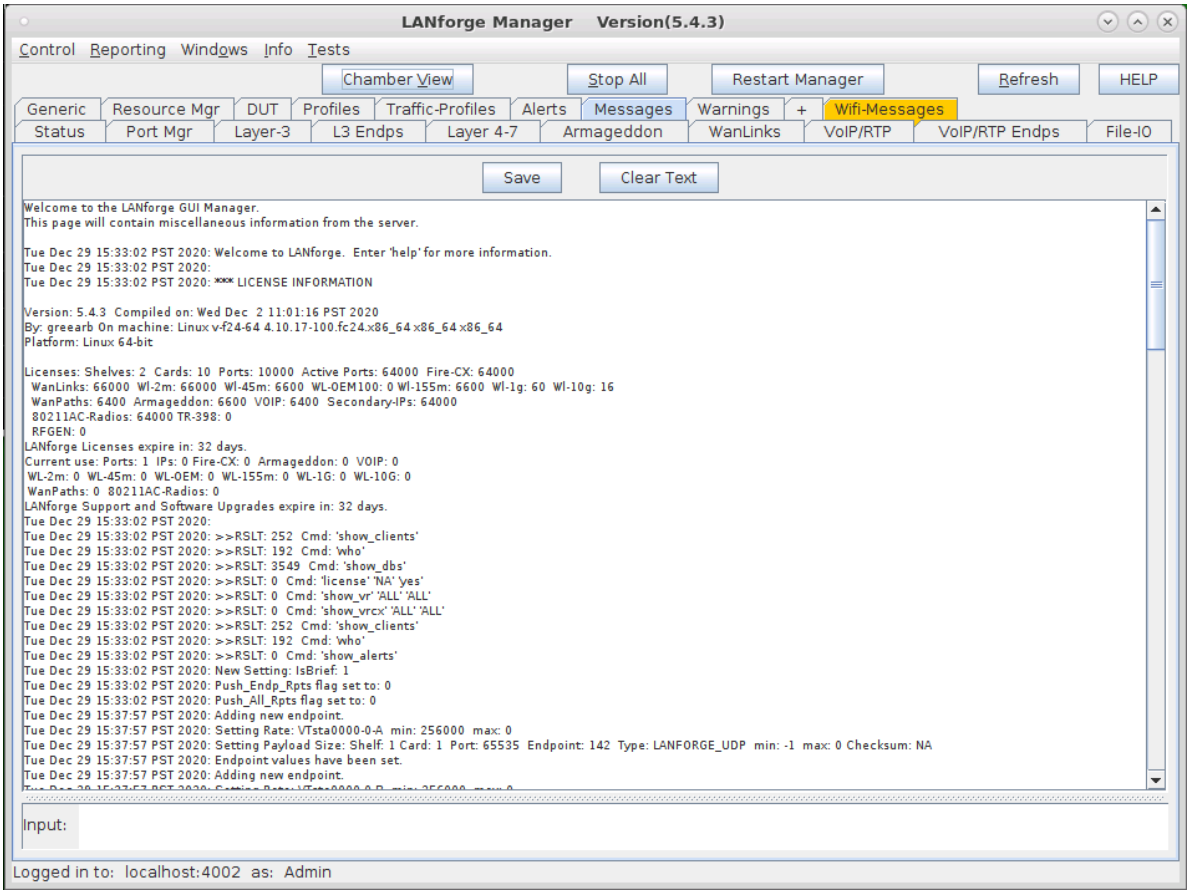
The *Resource Mgr* tab displays information on all Resources discovered by the LANforge server and provides the ability to perform system functions on selected machines (one or more). The definition of a resource is a LANforge machine that belongs to a numbered realm. The realm 255 is always a stand-alone 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*



For more information see Resources (Data Generator Machines)

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

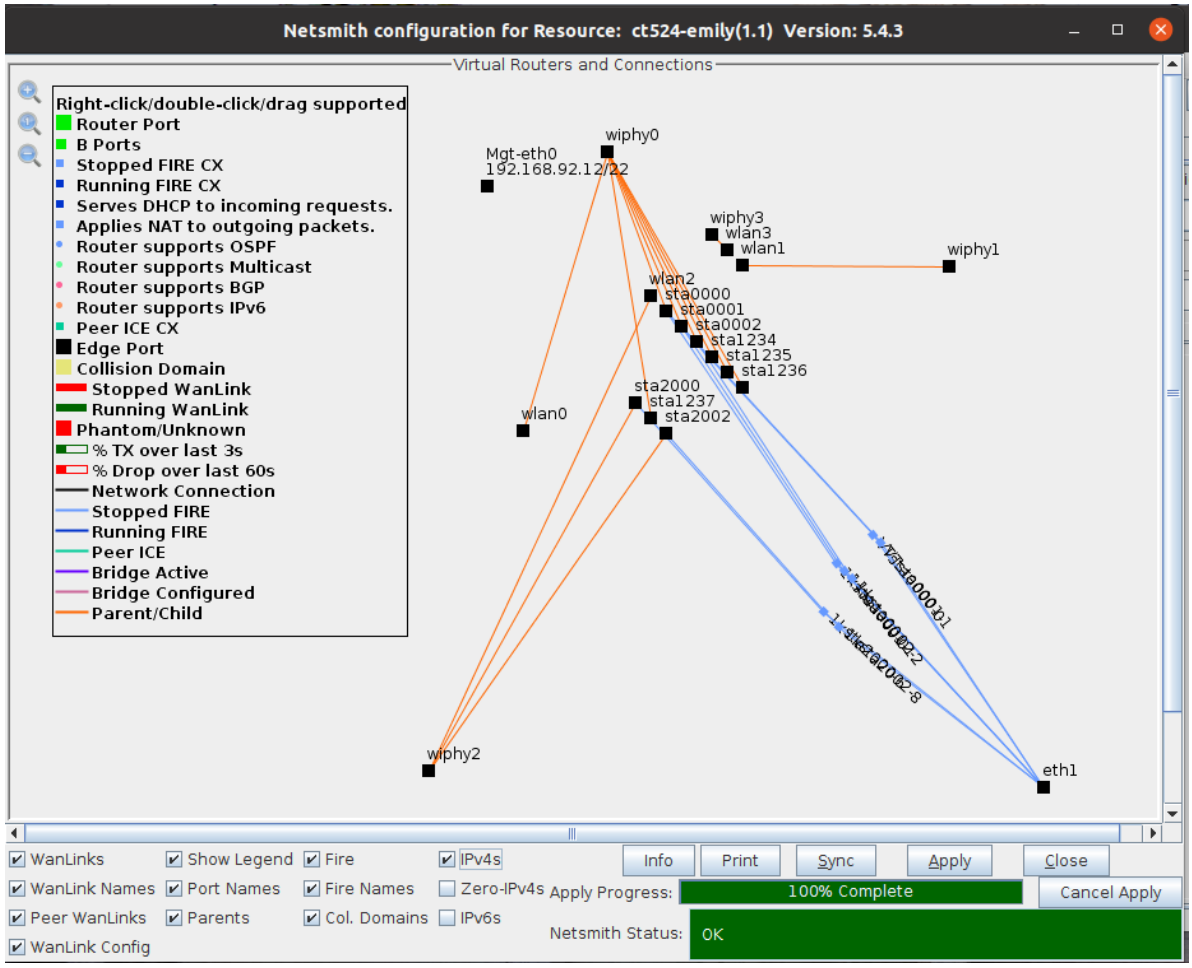
The *Messages*, *Warnings* and *Wifi-Messages* tab are all tabs that should be open at all times. All these tabs contain important information about the LANforge GUI Interface. The *Messages* tab displays detailed CLI command feedback from the LANforge Server. When scripting, command failures can be 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.



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:**

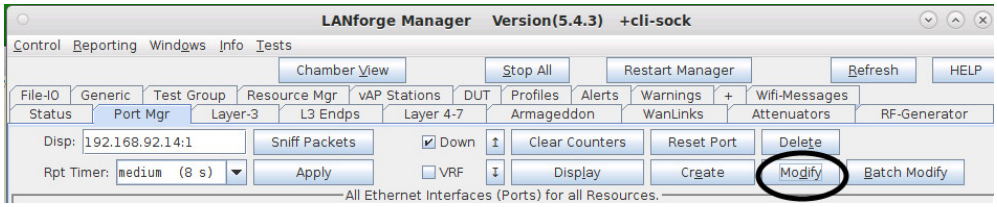
Please visit Step 1 of the following cookbook below to learn how to Create a Station in the LANforge-GUI. Please visit the link at the bottom of this section on how to script a station in the GUI.

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

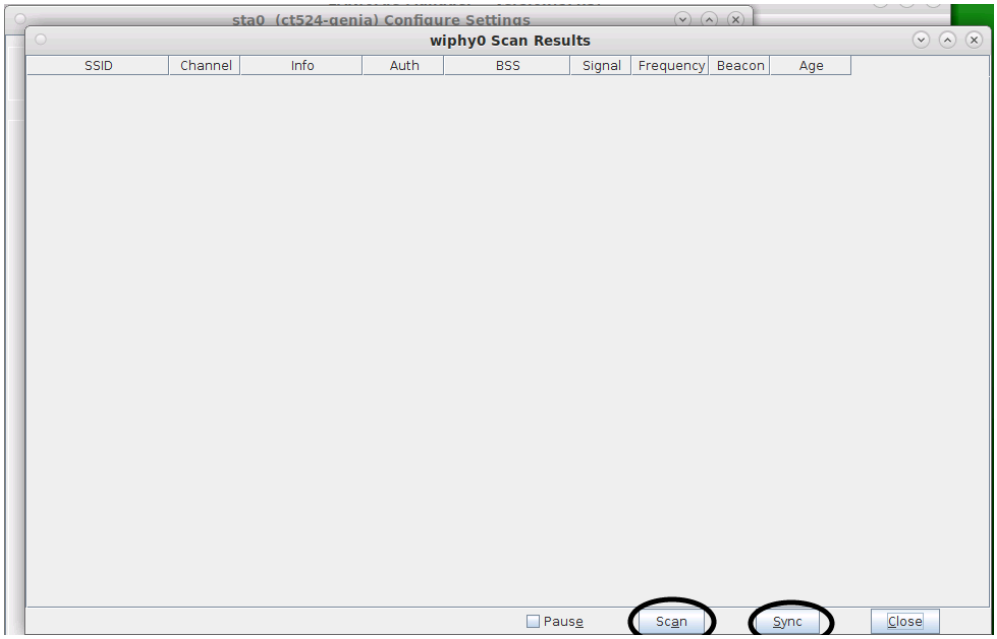
Often times, there may be an active network around, but the LANforge GUI does not have the network registered as "able to be connected to". To allow this network to be recognized, one must **scan** in the GUI object's settings to make sure that the object sees this network.

See below for an example:

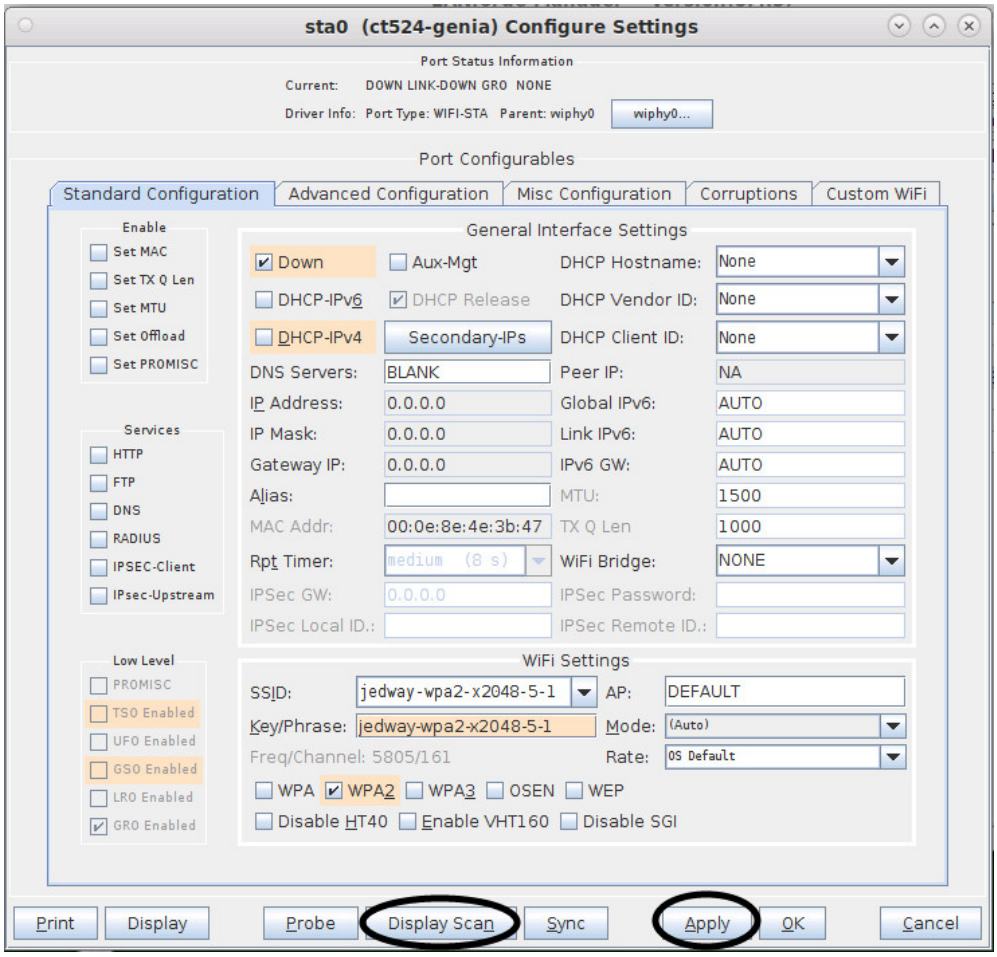
I. Double-click or select *Modify* on a station in the Port Mgr to pop up *Configure Settings* window.



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.

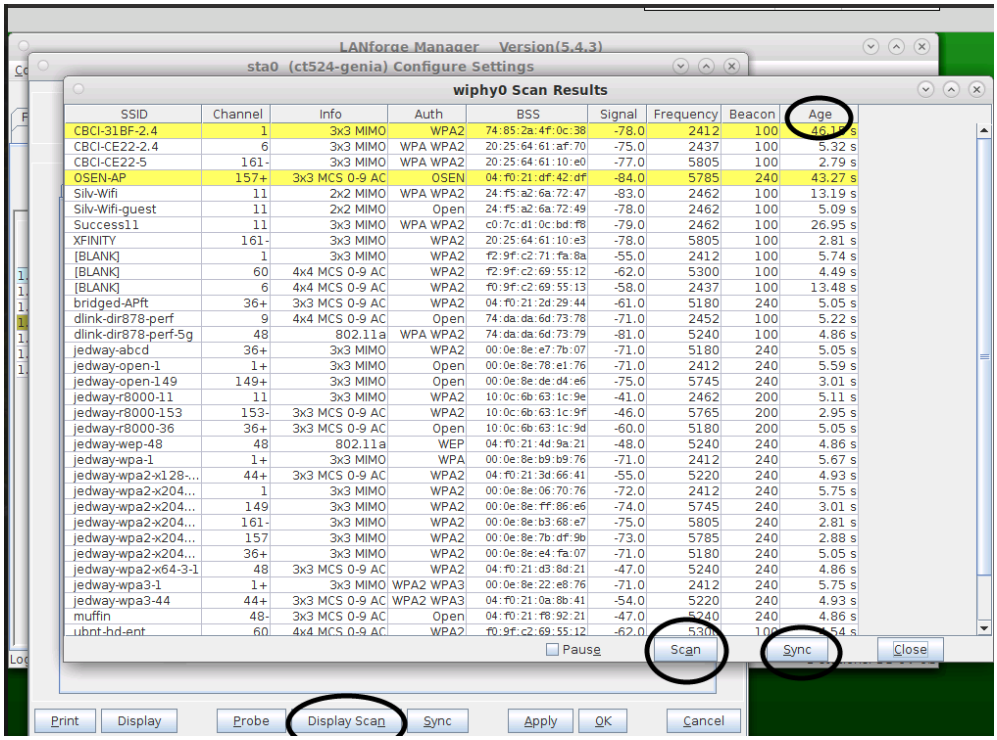


III. Type in the desired SSID, Key/Phrase, and select the appropriate Security to be used (WPA/WPA2/WPA3… etc) located within the *WiFi Settings* panel (shown below). Select *Apply*. *Apply* will trigger the LANforge GUI to start searching for currentlyactive SSIDs.

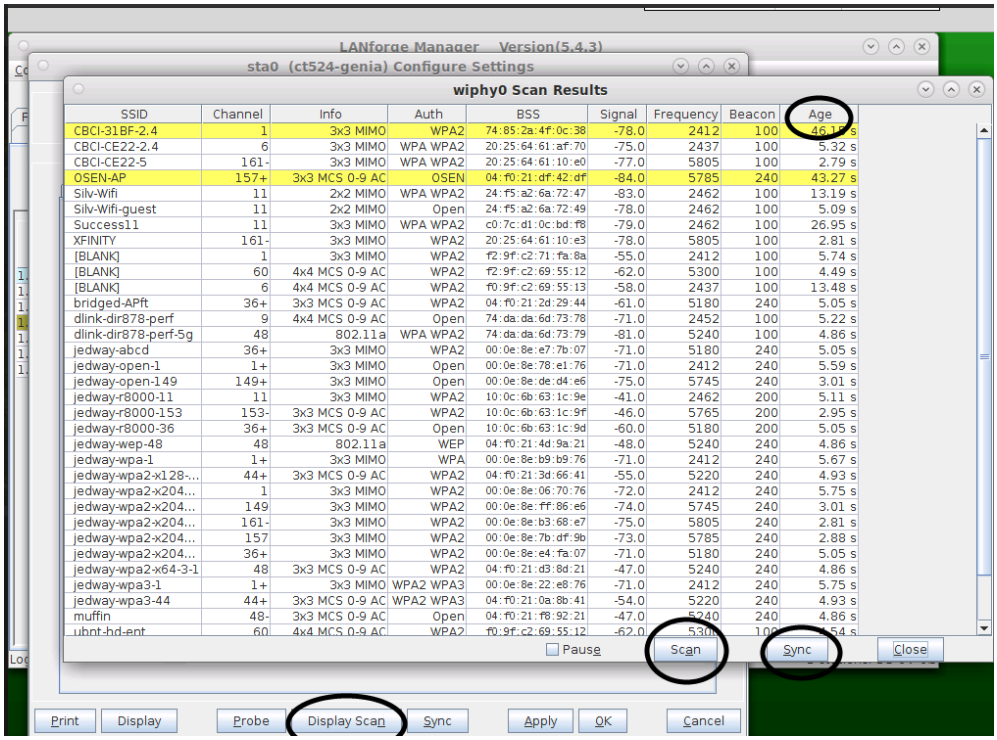


IV. Then, select *Display Scan* in the bottom bar, as highlighted in the picture above. Something similar to the Window in the picture below will pop up. Then click on *Scan* (circled below) and *Sync*. Now, the most recent active networks should be scanned and displayed in a similar window to below 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

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:**

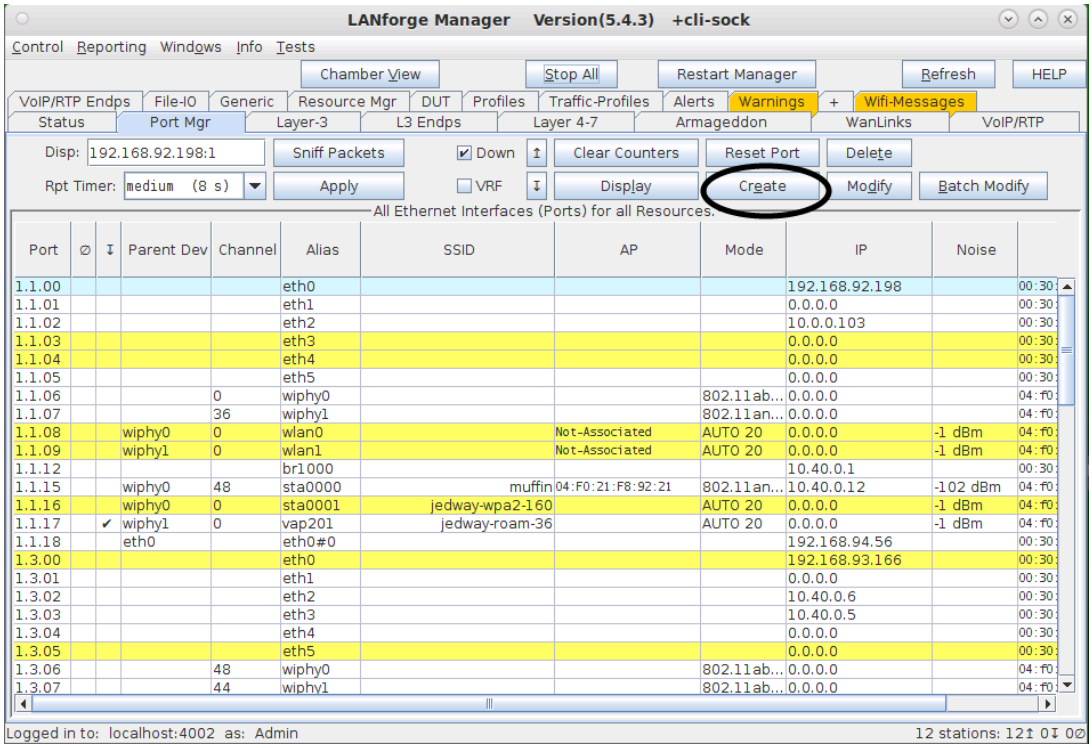
Creating a Bridge on the LANforge-GUI is done in the *Port Mgr.*

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

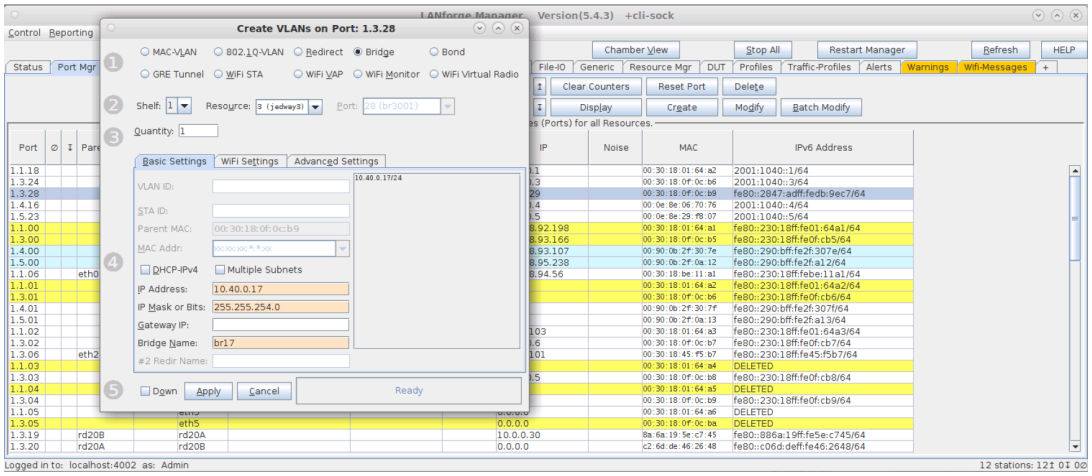
For more information see Creating a Bridge in *Netsmith* (Step 2)

A. Create a bridge in *Port Mgr*.

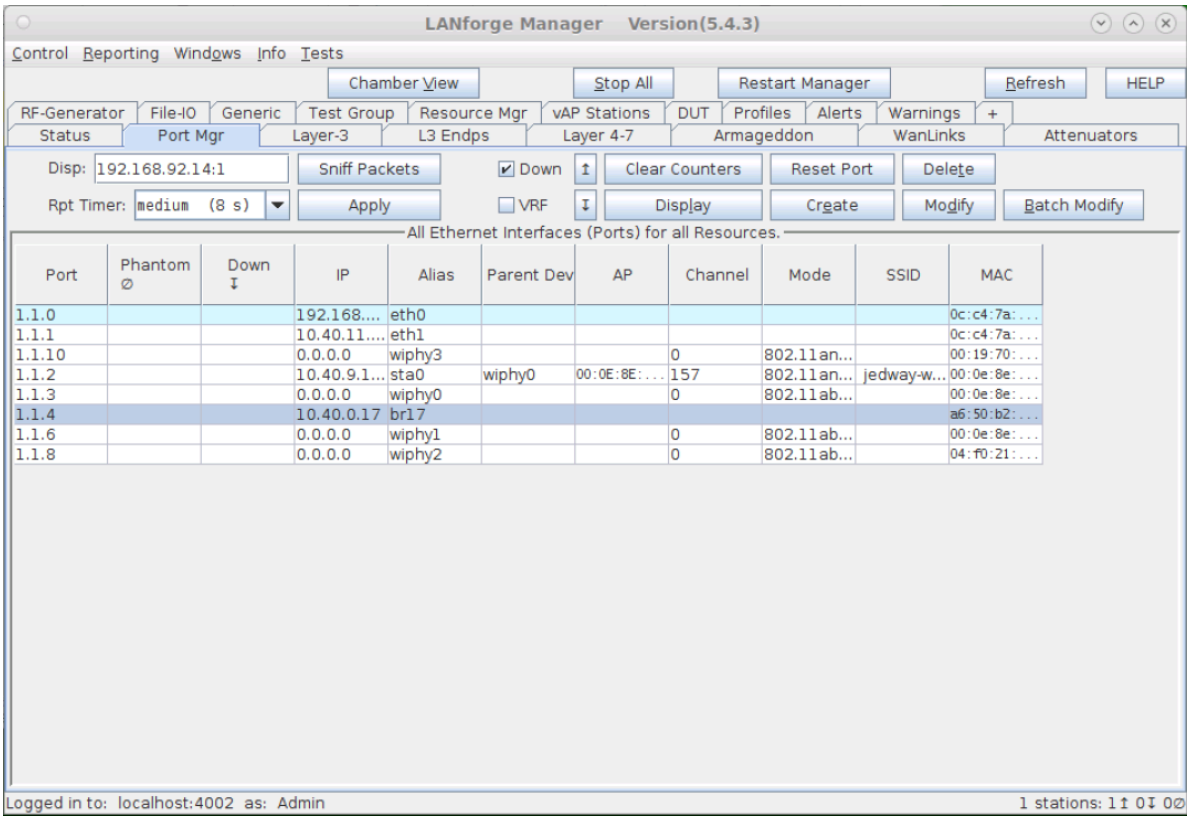
A. Click on the *Port Mgr* tab and Create in the top right corner.



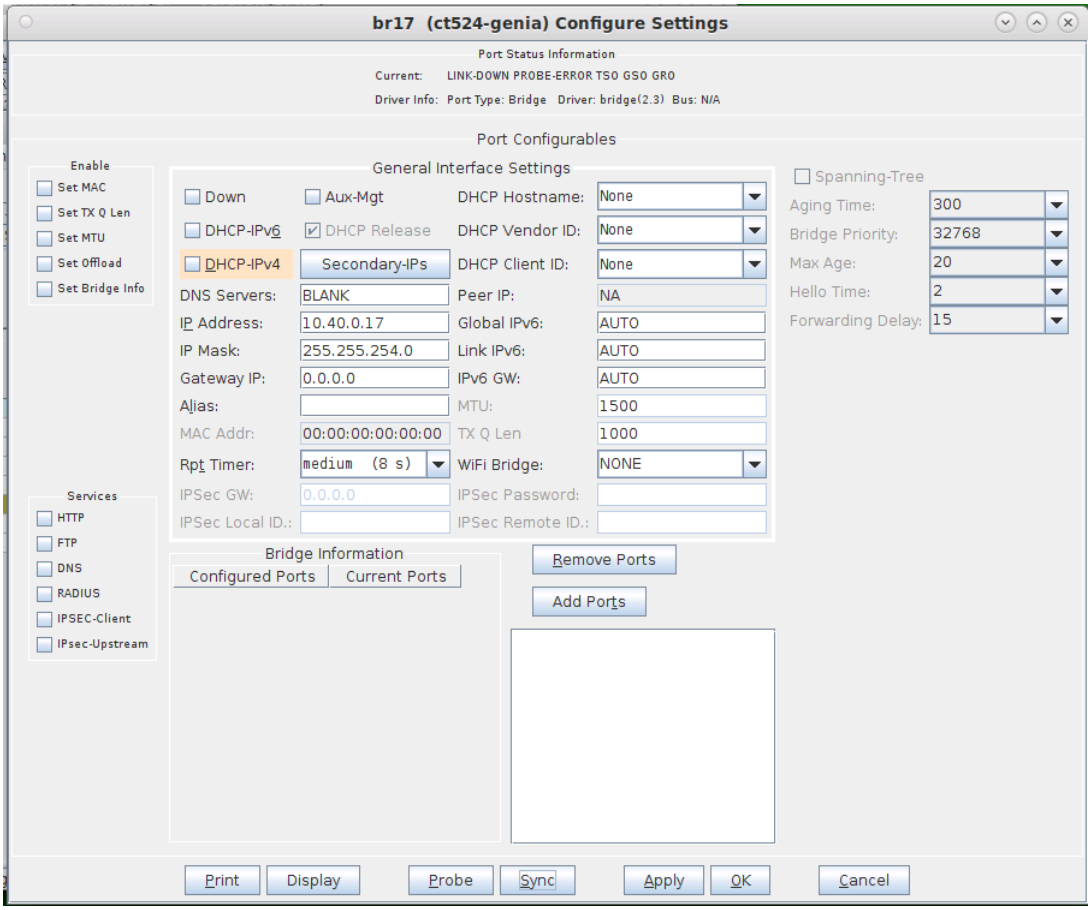
B. After a new window pops up, Select *Bridge* in Step 1 of the new window. In Step 2, select the *Shelf* and *Resource* the bridge should use (from the drop down menus in each slot). Step 3, select the *Quantity* of the bridges to be created. In Step 4, under the *Basic Settings* tab, check the box 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*.



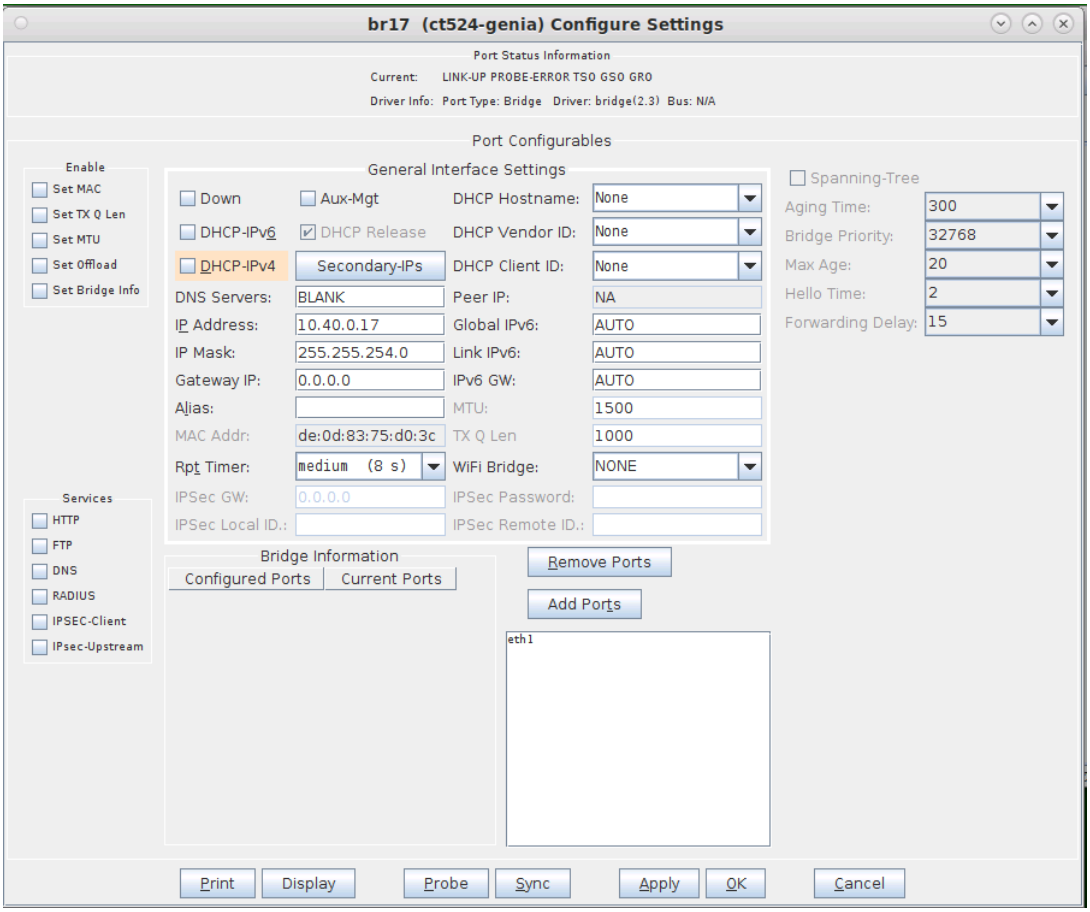
B. Adding a port to an existing bridge in *Port Mgr*.



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.



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

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 bridge

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

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