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Automated scanning of SSID, BSSID, and Signal of available wireless APs

Goal: Create a station and scan for SSID, BSSID, and Signal of available wireless APs

We will learn how to use a script to create a station and scan for available APs. We will then look at the /scanresults/ URI and the info we can get from a scan through JSON. Please refer to sta_scan_test.py as an example script.

1. Using the Script

A. Command Line Options

```
--sta_name nameOfStation
```

Specifies the name of the station to be created, if this option is used, the name will default to **sta0000**.

```
--ssid nameOfNetwork
```

Specifies the name of the network to connect to.
This value must be used, however, the SSID does not have to exist and a fake name can be used.

```
--security {WEP, WPA, WPA2, WPA3, Open}
```

Specifies the security type of the network to connect to.
This value must be used, however, if a fake SSID is used the type should be open.

B. Running the script

A. As an example, we can run the script using:

```
./sta_scan_test.py --sta_name sta0000 --ssid fake_ssid --security open --radio
```

B. This will produce output that looks like this:

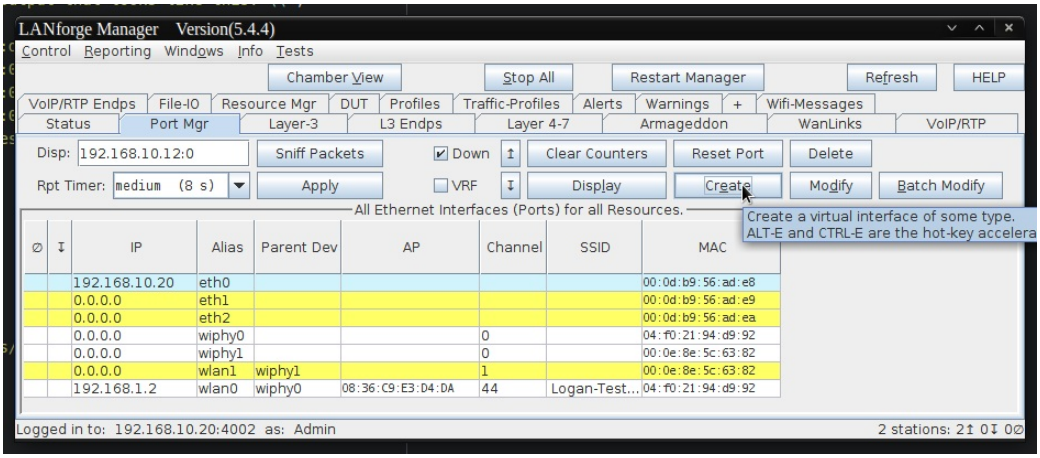
```
BSS                 Signal  SSID
08:36:c9:e3:d4:da   -32.0   Logan-Test-Net
10:56:11:0c:04:02   -80.0   :)
22:56:11:0c:04:02   -79.0   xfinitywifi
32:56:11:0c:04:02   -80.0   NA
```

This script produces limited output, for more detail we can look at the webpage hosted by LANforge.

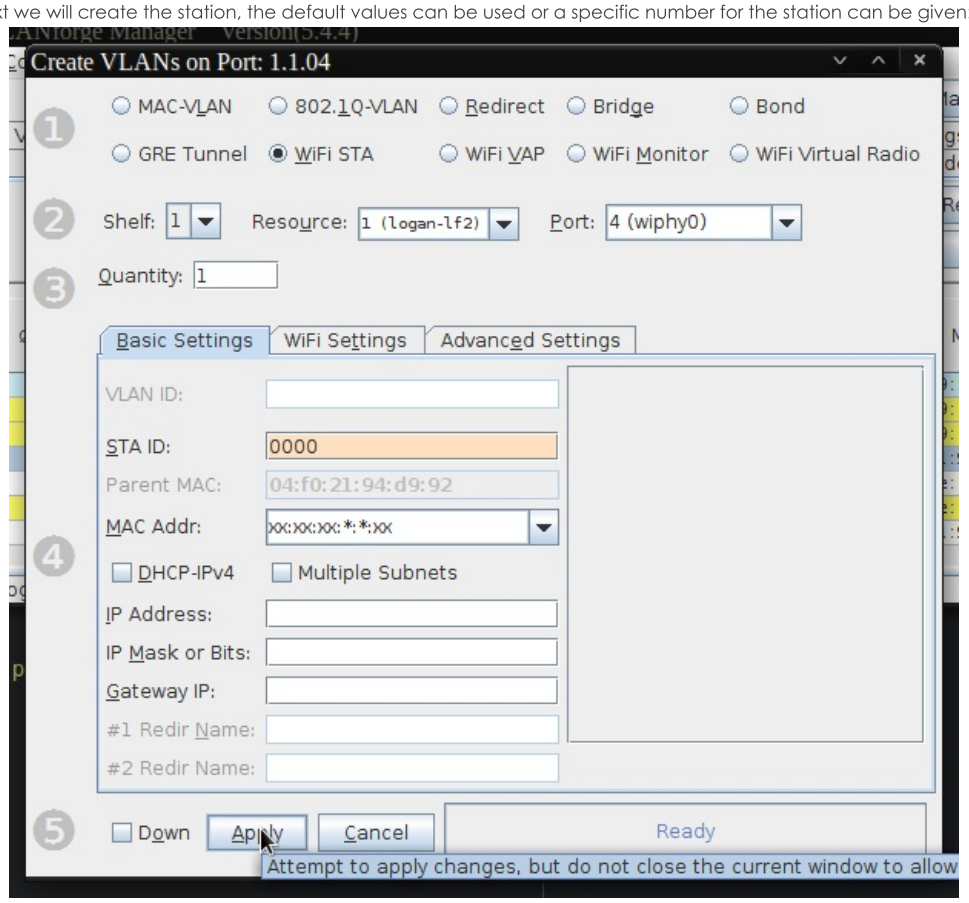
2. The /scanresults/ URI

A. In order to view this page we will need to create a station and start a scan.

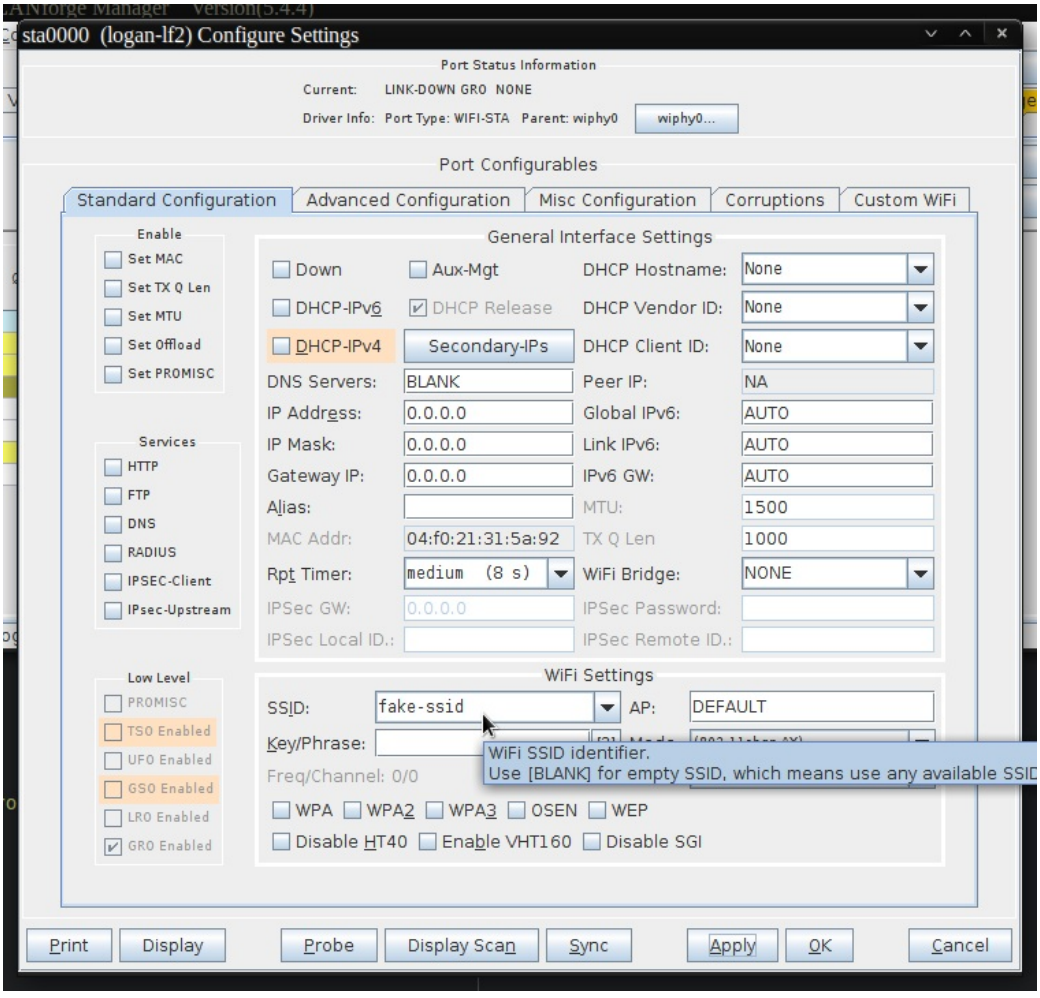
A. First we will create the station (Make sure to click on a radio in the Port Mgr tab first):



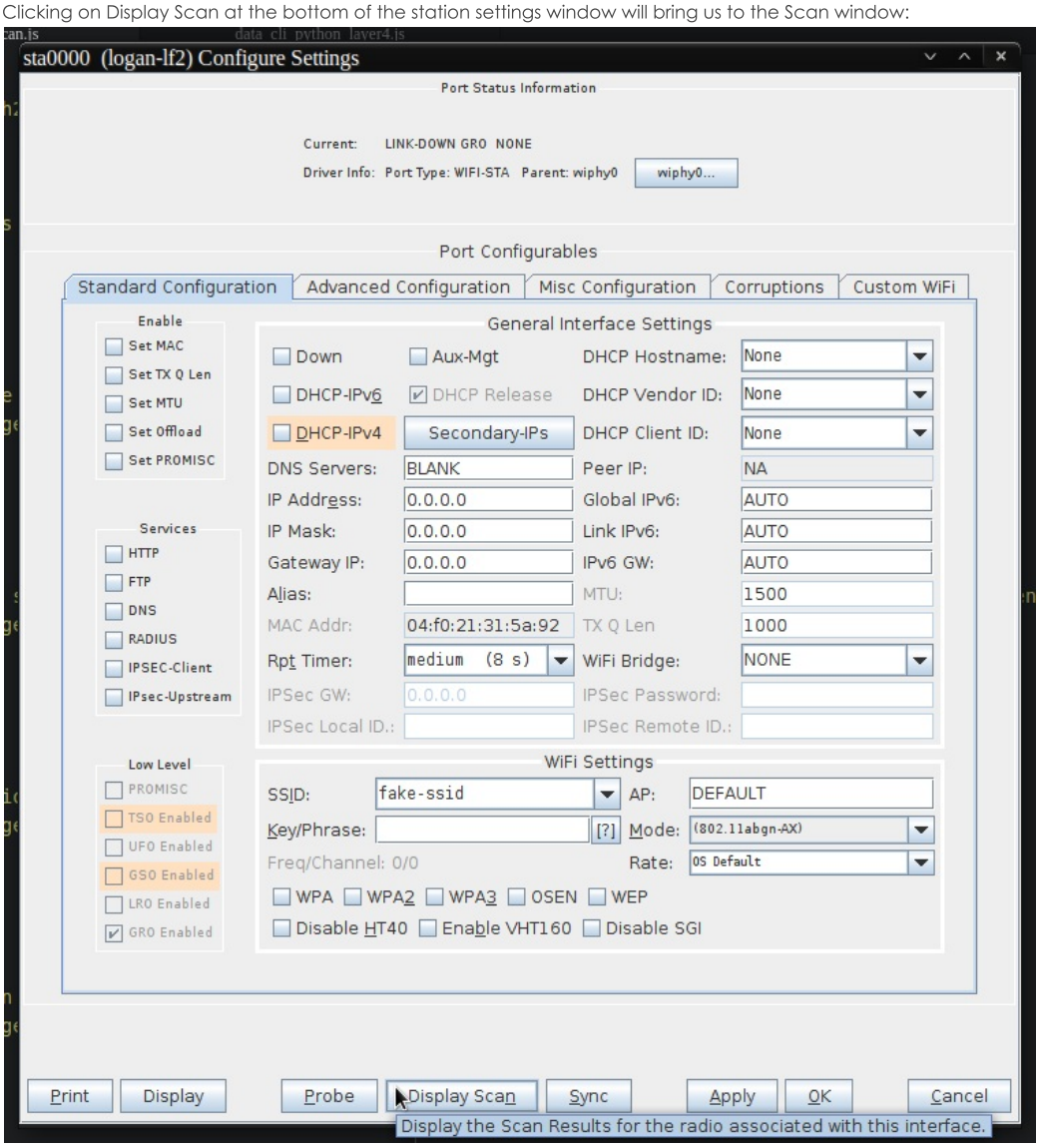
B. Next we will create the station, the default values can be used or a specific number for the station can be given:



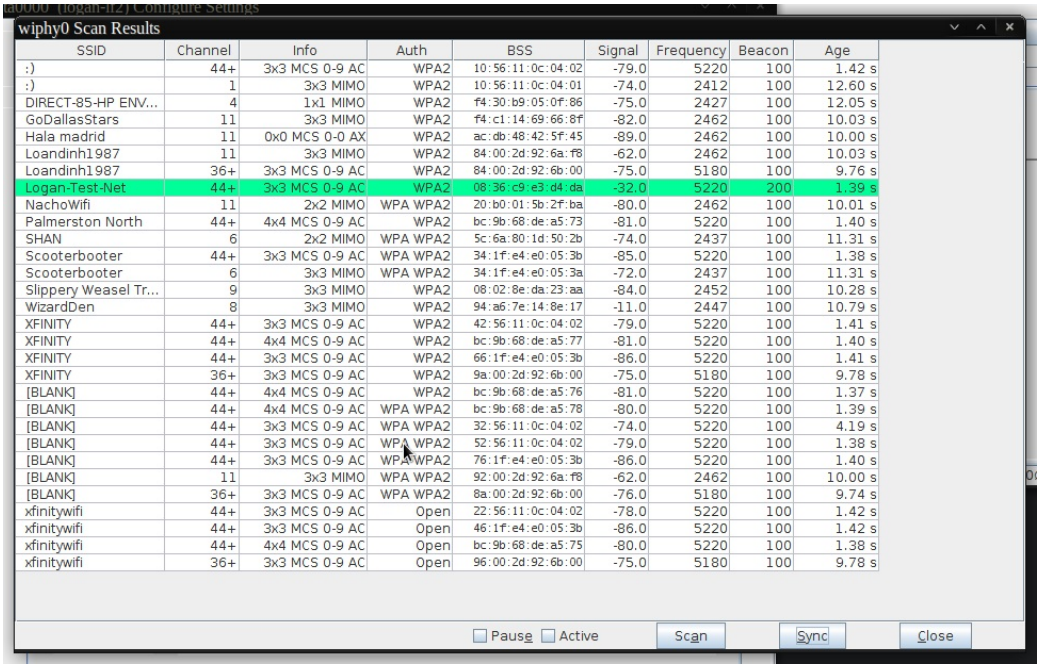
C. After creating the station, we will give the an SSID to connect to. (This doesn't have to be a real AP):



D. Clicking on Display Scan at the bottom of the station settings window will bring us to the Scan window:



E. Finally we'll be able to start the scan and see the results. Clicking on Scan and waiting a few seconds will show all of the APs availble to the station:



3. **JSON Response from /scanresults/**

A. Another way of viewing the same information is to use the /scanresults/ URI. This URL can be found at your LANforge ip using port 8080. Ex: 192.168.10.20:8080/scanresults. We will also need the shelf number, the resource number, and the station name. The final URL would look like this **192.168.10.20:8080/scanresults/1/1/sta0000**

B. The scan results can be viewed through JSON by using cURL on the same URL as before. The response will look like this:

```
{"handler":"candela.lanforge.HttpStationScan$FixedJsonResponder","uri":"
scanresults/:shelf_id/:resource_id/:port_id","candela.lanforge.HttpStationScan":
{"duration":"1"},"scan-results":[{"1.1.4.08:36:c9:e3:d4:da":{"age":"2238","auth":"WPA2
"beacon":"200","bss":"08:36:c9:e3:d4:da","channel":"44","entity id":"1.1.4",
"frequency":"5220","info":"3x3 MCS 0-9 AC","signal":"-32.0","ssid":"Logan-Test-Net"}}]
```

4. ## Accessing and Printing JSON Response with Python

A. We will use sta_scan_test.py as an example for a `start()` method

A. First, we'll need to send a JSON post using realm. Use this cookbook as reference for getting started with realm. Our JSON will look something like this:

```
data = {
"shelf": 1,
"resource": 1,
"port": self.sta_list
}
```

B. We can then use `json_post` to send the request. We'll need to wait about 15 seconds to give the scan time to happen

```
self.json_post("/cli-json/scan_wifi", data)
time.sleep(15)
```

C. Next, we'll create a variable with the results from the scan using

```
scan_results = self.json_get("scanresults/1/1/%s" % ','.join(self.sta_list))
```

D. Finally, we'll create a loop to iterate through the JSON response and print some nicely formatted output

```
print("{0:<23}".format("BSS"), "{0:<7}".format("Signal"), "{0:<5}".format("SSID
for result in scan_results['scan-results']:
    for name, info in result.items():
        print("%s\t%s\t%s" % (info['bss'], info['signal'], info['ssid']))
```

B. Final Results

A. Our final function will look like this:

```
def start(self):
    self.station_profile.admin_up()
    print(self.sta_list)
    print("Sleeping 15s while waiting for scan")
    data = {
        "shelf": 1,
        "resource": 1,
        "port": self.sta_list
    }
    self.json_post("/cli-json/scan_wifi", data)
    time.sleep(15)
    scan_results = self.json_get("scanresults/1/1/%s" % ','.join(self.sta_list)

    print("{0:<23}".format("BSS"), "{0:<7}".format("Signal"), "{0:<5}".format('
    for result in scan_results['scan-results']:
        for name, info in result.items():
            print("%s\t%s\t%s" % (info['bss'], info['signal'], info['ssid']))
```

B. Our formatted output should look like this:

```
BSS                     Signal  SSID
00:0e:8e:52:4e:82       -33.0   test-net
08:36:c9:e3:d4:db       -31.0   Logan-Test-Net
08:36:c9:e3:d4:dc       -27.0   Logan-Test-Net
```