Establishing a Stable WiFi Connection on the BeagleBone via Network Bridging

Preface

Connecting to the WiFi network on an SFU campus can prove to be a difficult task. Before writing this guide, we (the authors) managed to establish a connection between a WiFi dongle and SFU-SECURE, but the connection wasn’t stable. Disconnects and high latency issues were found. Setting up a connection through a router proved to be much more stable. This guide will show you how to setup an access point (via a router) using a laptop connected to SFU’s WiFi connection. This is process is known as Network Bridging.

Requirements

Hardware

- WiFi Dongle - Used the Edimax EW-7811Un Wifi Dongle in this guide.
- Router - Used the TP Link Archer C7 in this guide
- BeagleBone
- Laptop with an ethernet port that is connected to SFU WiFi - Used Lenovo Y50
- Ethernet Cable (Category 5)

Software

- Network manager on the BeagleBone: sudo apt-get install network-manager

Steps

Hardware Setup

1. Connect the laptop to the Internet port of your router with the ethernet cable.
2. Plug in the WiFi dongle to the BeagleBone

Software Setup

Laptop

1. Go to the adapter settings page on Windows

   a. Highlight the Wi-Fi and Ethernet adapters, right click and click “Bridge Connections”

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3. Connect to the Access Point identified by the bridged connection
BeagleBone

1. Make sure WiFi dongle is detected by the BeagleBone. Use `ifconfig` to check.
   - `ifconfig` revealed the dongle as wlan0
     - Optional: `ifconfig wlan0 up` to activate the connection
2. Install `nmcli`, view Requirements section above.
3. Check that network manager installed by using the command `nmcli` in a terminal
4. Scan networks with: `nmcli dev wifi`
5. Connect to a network using
   - `nmcli dev wifi con "SSID" password "password"
     - If a connection previous connection was already set up you use `nmcli con up "mySSID"` to switch to a different connection.
6. Connection should persist through reboots

Troubleshooting

- When bridging two adapters, the Network Bridge may be stuck on “Identifying...”. If this is the case, try rebooting the router and deleting the Network Bridge. Then, re-do the bridging process.