LAB 03 – BEACON SCAVENGER HUNT

I encountered difficulties with the wireless card upon beginning Lab 03 at 1:23:31 PM on 02/01/2024. Initially, the wireless card was recognized by iwconfig; however, airodump-ng failed to return any results. Despite multiple system reboots, the issue persisted, and iwconfig ceased to detect the wireless card altogether.

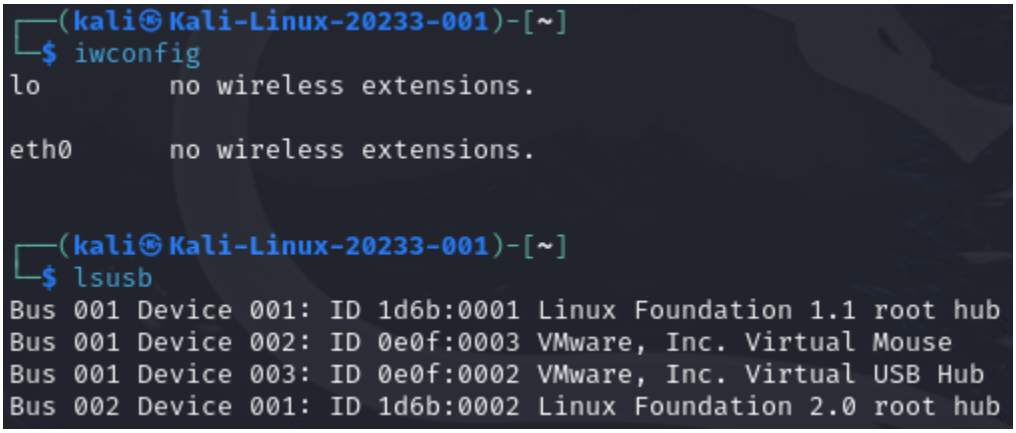
Upon encountering the issue, I promptly submitted a report through the provided form (https://forms.gle/1waNYx55Cro9kPR96) at approximately 2:30 PM on 02/01/2024.

Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 02:21:30 PM	02/01/2024, 02:21:30 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 02:21:30 PM	02/01/2024, 02:21:30 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 01:23:31 PM	02/01/2024, 01:23:31 PM	com.vmware.vcloud

Throughout the evening, I periodically logged in to assess the status of the wireless card.

Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 06:03:42 PM	02/01/2024, 06:03:42 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 05:58:08 PM	02/01/2024, 05:58:08 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 05:57:41 PM	02/01/2024, 05:57:41 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 05:56:45 PM	02/01/2024, 05:56:45 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 05:52:59 PM	02/01/2024, 05:52:59 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 05:52:58 PM	02/01/2024, 05:52:58 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 05:51:52 PM	02/01/2024, 05:51:52 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 05:29:03 PM	02/01/2024, 05:29:03 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/02/2024, 04:42:39 AM	02/02/2024, 04:42:39 AM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/02/2024, 04:23:37 AM	02/02/2024, 04:23:37 AM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/02/2024, 01:11:32 AM	02/02/2024, 01:11:32 AM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/02/2024, 01:05:27 AM	02/02/2024, 01:05:27 AM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/02/2024, 12:40:57 AM	02/02/2024, 12:40:57 AM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 08:48:41 PM	02/01/2024, 08:48:41 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 08:38:32 PM	02/01/2024, 08:38:32 PM	com.vmware.vcloud
Acquired Screen Ticket of Virtual Machine Kiera.Conway_Cronin_Kali	Succeeded	kiera.conway	02/01/2024, 06:03:42 PM	02/01/2024, 06:03:42 PM	com.vmware.vcloud

During this time I made several efforts to resolve the issue, including system reboots and updates. However, due to the absence of physical access to the machine and limited information about the specific adapter type, which is identified only as being from Ralink Technology Corp, I encountered challenges in identifying a suitable solution. However, despite my efforts, the wireless adapter remains unrecognized by the virtual machine as of 5:10 AM PST on 02/02/2024.



Regrettably, the inability to scan the wireless network prohibits me from completing questions 1-9 of the lab assignment. However, I am fully committed to completing the assignment promptly upon resolution of the adapter recognition issue, provided it is permissible within the course guidelines.

I appreciate your understanding of the challenges encountered during this lab session and assure you of my dedication to completing the assignment to the best of my ability.

Thank you,

Kiera Conway

Question 10) Researchy question! 802.11ax, marketed to the muggles as WiFi 6, is pretty neat. It's introduced a lot of new features, they're really only useful in dense environments. Advice: don't bother upgrading to AX in order to improve your home's wifi performance. To that end, one of the neat features that are introduced is the notion of "spatial reuse". We achieve this through coloring (basic service set coloring or more broadly as a network color code). No crayons needed. What is this?

Spatial reuse is a feature introduced in 802.11ax (WiFi 6) networks by Cisco. Its primary goal is to enhance efficiency and throughput in dense wireless environments, known as Basic Service Set (BSS), where large groups of wireless devices communicate through a centralized access point [1].

However, the radio frequency spectrum available for Wi-Fi communication is finite. Regulatory agencies such as the Federal Communications Commission (FCC) allocate specific frequency bands for Wi-Fi, and within these bands, there are only a limited number of channels available for wireless communication [2]. Therefore, in environments with many wireless networks or devices, it is common for "multiple BSSs [to] operate [within] the same channel" [3]. This overlapping operation known as Overlapping BSS (OBSS) can lead to signal interference, degraded communication quality, packet collisions, and reduced throughput.

To address this challenge, spatial reuse provides a mechanism that assigns colors to different BSSs within the same wireless network. By assigning distinct 'BSS color' values within the HE PHY headers of nearby BSSs, devices can distinguish between simultaneous packets from different BSSs and avoid interference [4]. This approach enables multiple BSSs to efficiently operate in dense environments by minimizing interference, degradation, and collisions.

Sources:

[1] https://www.geeksforgeeks.org/introduction-of-basic-service-set-bss/
[2] https://www.electronics-notes.com/articles/connectivity/wifi-ieee-802-11/channels-frequencies-bands-bandwidth.php
[3] https://www.mathworks.com/help/wlan/ug/spatial-reuse-with-bss-coloring-in-an-802.11ax-network-simulation.html#responsive_offcanvas
[4] https://www.cisco.com/c/en/us/td/docs/wireless/controller/9800/17-1/config-guide/b_wl_17_11_cg/b_wl_17_11_cg_chapter_010000101.html