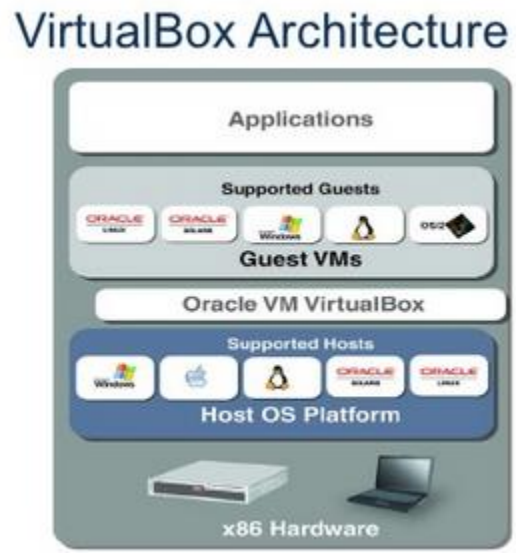
Lab – Installing a Wireless Adapter in Kali Using VirtualBox

Overview

In this short lab, you will learn how to add a wireless adapter to a virtual installation Kali Linux using VirtualBox. Virtualization happens at the hardware layer of the host machine. For the most part, VirtualBox does a great job of emulating everything a virtual install of Kali Linux needs, but there are exceptions. One of those exceptions is the emulation of wireless network adapters.



Kali Linux comes configured with a limited number of drivers for different wireless adapter chipset. Still, when it comes to Wi-Fi hacking, you cannot use just any wireless USB adapter. Your USB wireless adapter needs to supports packet injection and monitor mode.

Packet Injection

Packet injection allows you to craft, inject, or send data to wireless devices/networks nearby. Without it, you cannot intercept or manipulate any activity from within a network.

Monitor Mode

Monitor mode allows you to capture data sent and received by wireless devices/networks nearby. Without it, you cannot see which devices are active and what is happening on the network.

Every manufacturer uses a particular chipset for their network adapter, but only the following chipsets are known to be capable of injecting packets. Chipsets that are equipped with packet injection can also go into monitor mode.

This list is not all-inclusive. There are other chipsets, but my research and feedback from Kali users make these chipsets the best choice for hacking wireless networks.

These chipsets are known to support packet injection and monitor mode in Kali:

- Atheros AR9271
- Ralink RT3070
- Ralink RT3572
- Ralink RT5370N
- Realtek RTL8812AU

When you match these chipsets with the best in class for wireless adapters that can perform packet injection using Kali Linux, you have a much higher probability of hacking into a wireless network. But this list is not all-inclusive either.

Rank	Adapter	Chipset	Packet Injection
#1	ALFA AWUS036NHA	Atheros AR9271	✓
#2	ALFA AWUS036NH	Ralink RT3070	✓
#3	TP-LINK TL-WN722N (v1)	Atheros AR9271	✓
#4	ALFA AWUS036NEH (not tested)	Ralink RT3070	✓
#5	ALFA AWUS036ACH (not tested)	Realtek RTL8812AU	✓

I purchased a $14.00 wireless adapter from Amazon after my research showed the Panda PAU05 USB wireless adapter was an excellent choice for auditing wireless networks and remaining stealthy while doing so. After some additional research, I also tested the Alfa AWUSO36NH High Gain USB Wireless G / N Long-Rang WiFi Network Adapter, which did perform and install easier, but they both used the same driver

Mediatek RT2870 Wireless LAN Card

The difference in price was roughly $5.00 more for the ALFA.

Installing a USB wireless adapter for Kali Linux

Important!

Make sure your installation of Kali Linux is the latest version and that you have downloaded and installed the correct VirtualBox Extension Pack.

Important!

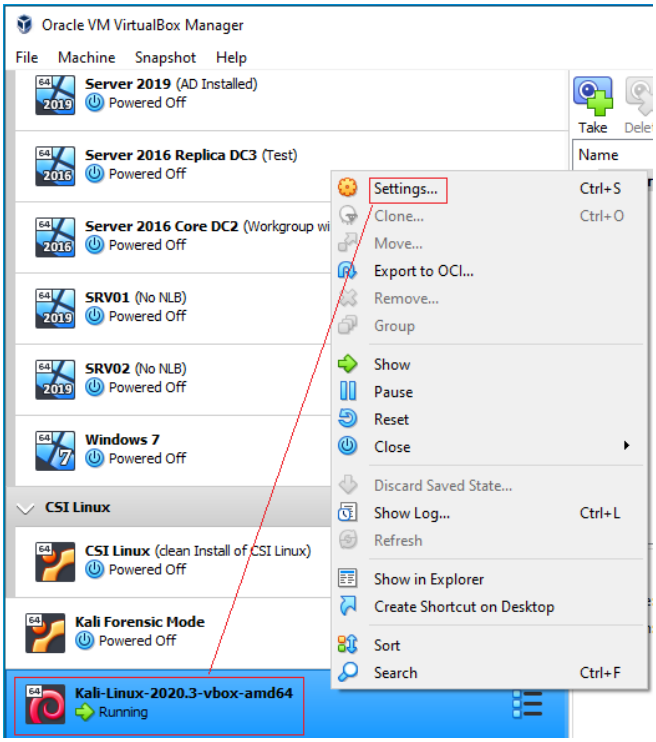
From your PC or laptop, ensure your wireless USB adapter has been installed and is working within your host operating system. In this example, I have installed my Panda PAU05 USB wireless adapter to an available USB 3.0 port on my desktop computer

Once I have the wireless adapter installed, and it is operational, I open my VirtualBox Manager, find my virtual machine for Kali Linux, right-click, and from the context menu, select Settings.

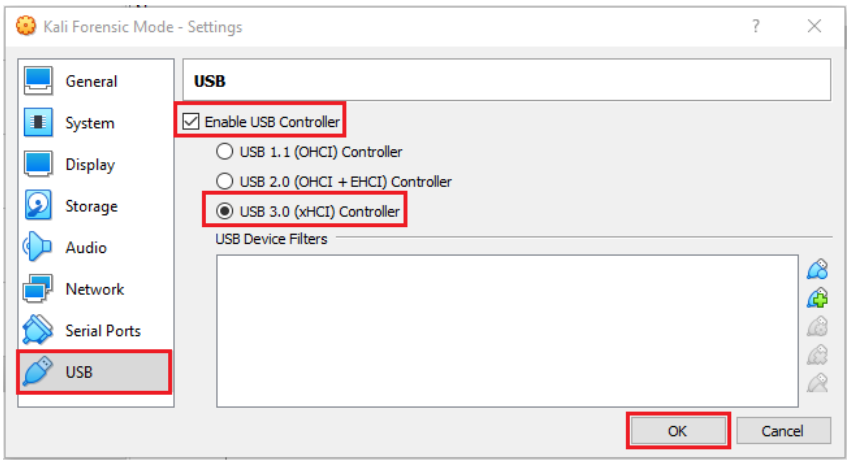
Important!

Enable USB 3.0 Support

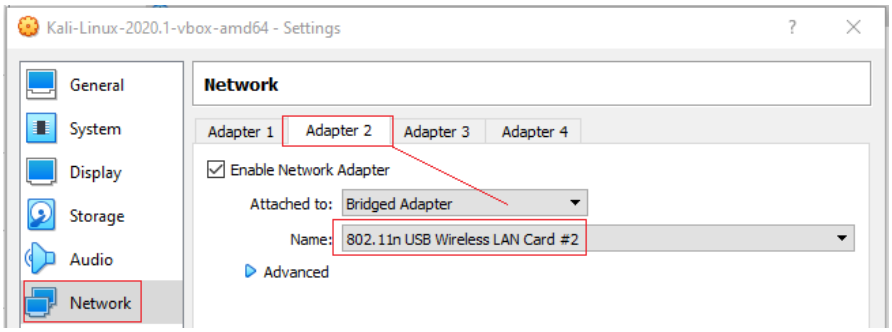
From the left windowpane of your VirtualBox Manager, right-click on the installation of Kali Linux and go to settings.



In the next window, scroll down in the left windowpane and select USB. Ensure Enable USB Controller is selected and then ensure the radio button for USB 3.0 (xHCI) Controller is set.

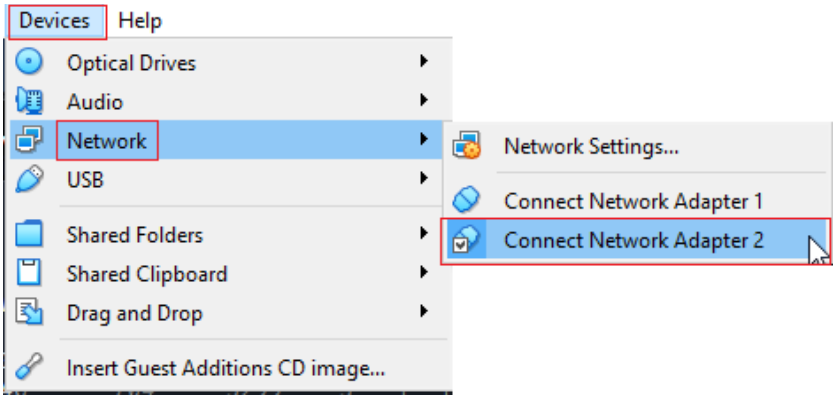


From Settings, scroll down the left-hand windowpane until you come to network. We need to add the WiFi adapter as a second connection to Kali Linux. Select the tab for Adapter 2, 3, or 4. Check the box for Enable Network Adapter. Under Attached to, pull down the window and select Bridged networking. For the name of the adapter, pull down the windows and choose your wireless adapter. Click OK.

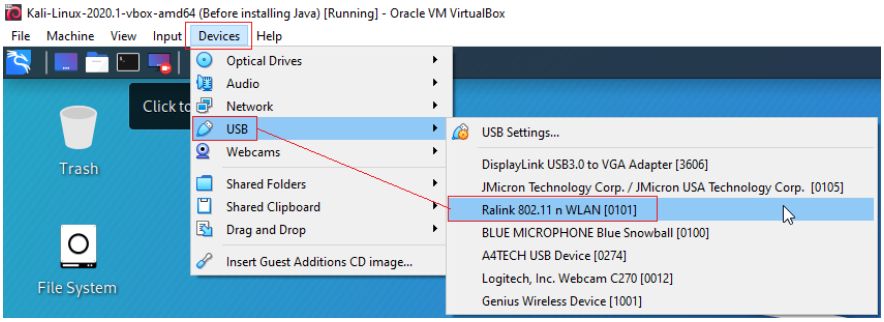


Important!

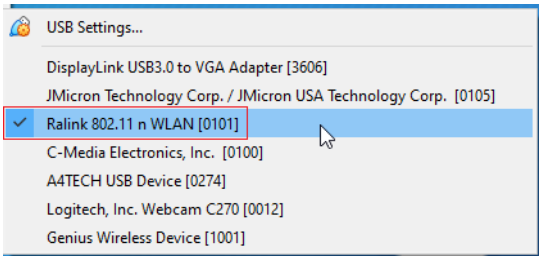
Start your virtual install of Kali Linux and log on as root. Once you have a desktop, go to your VirtualBox taskbar, click on Devices, and from the context menu, select network. You will see that you have two available connections. Uncheck Adapter 1 and ensure that Adapter 2 is check.



From the next context menu, select USB and find your wireless adapter and click it one time to enable and allow Kali to have access to it. The name of the adapter represents the driver for the chipset that Kali used to communicate with the wireless adapter.



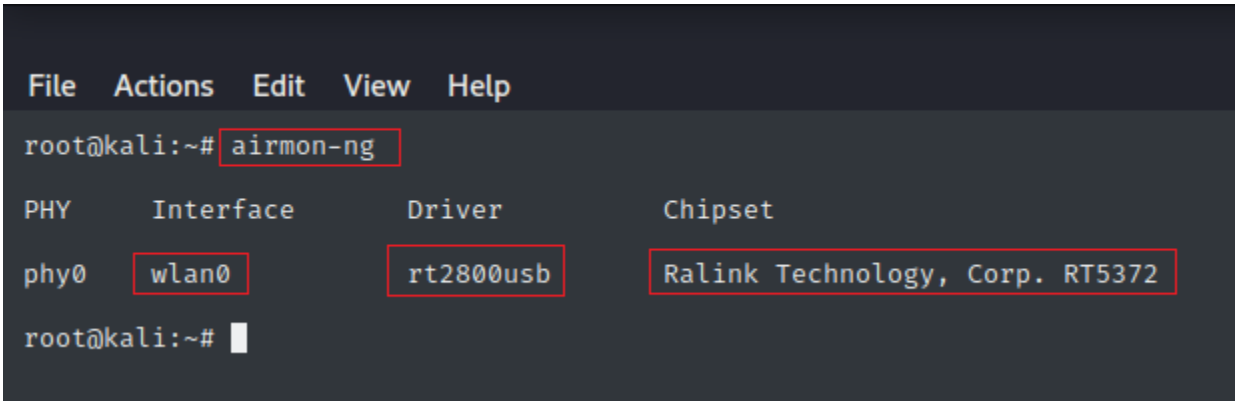
When you go back in check your adapter, you will notice the adapter has a checkmark next to it, making it available in Kali.



With the wireless adapter now available in Kali. We can open a terminal and check to see if the adapter is present and can be configured for packet injection and monitor mode.

At the terminal prompt, type `airmon-ng` and press enter.

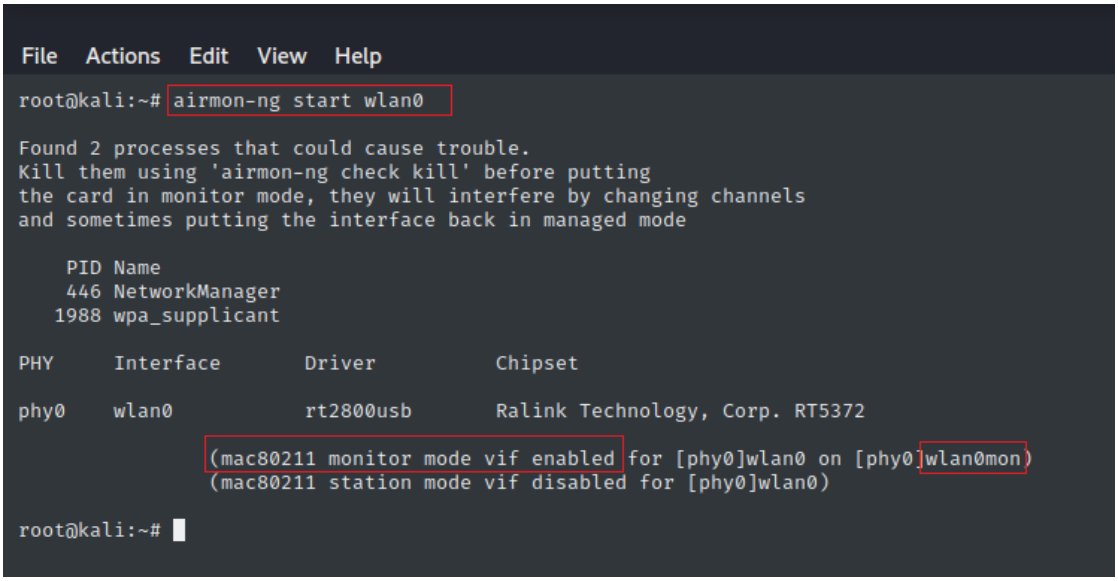
`airmon-ng`



Under Interface, we are given the name assigned to the wireless adapter. Next, we see the driver Kali is using to communicate with the adapter, and lastly, we are given the name of the chipset the adapter is using.

We next need to start the wlan0 adapter in monitor mode. For this, we use the **`airmon-ng start wlan0`** command.

`airmon-ng start wlan0`



This is where we will be told if our adapter support monitor mode, and once we put the adapter into monitor mode, the name of the adapter changes to **wlan0mon**.

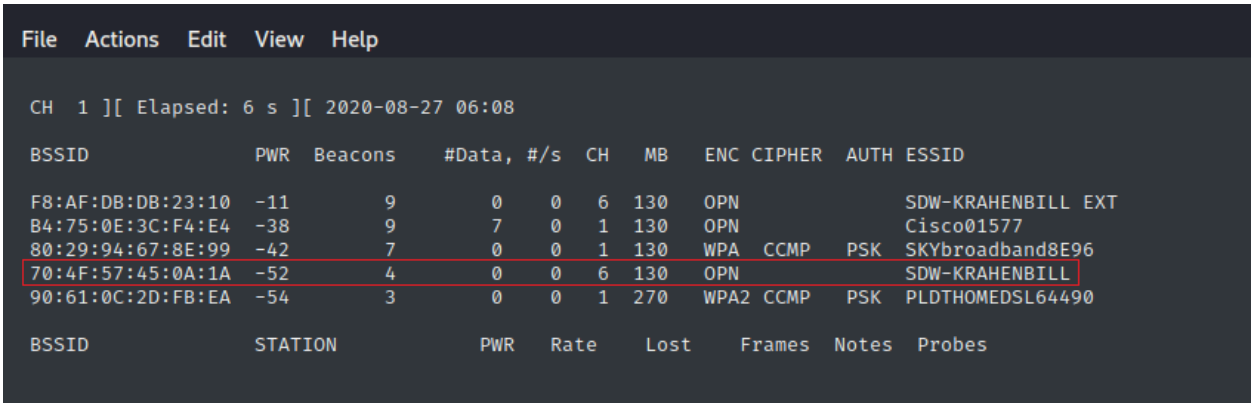
Audit for all available wireless networks

We are now ready to begin capturing any wireless signals within the range of our attack machine.

To do this, at the terminal type **`airodump-ng wlan0mon`**

`airodump-ng wlan0mon`

Here we see the available networks in my area. I have highlighted my wireless network. Your results will differ.



Summary –

If you choose a wireless adapter with a chipset Kali can use, VirtualBox with the right extension pack, and you have enabled USB 3.0 support, the process should be very straight forward. It is never a 100 % assured process. I troubleshoot not finding any wireless networks for two days, but my persistence paid off. YouTube and the web are full of advice on how to troubleshoot wireless adapter not working in Kali. Invariably, it just may come down to Kali not having a driver for the chipset. Therefore, it is essential to ensure that any adapter you purchase is compatible with Kali Linux.

I did find this video and download it on YouTube when Kali cannot find a driver for some chipsets.

Kali Linux Wireless Driver Install & Download || Not Detect Kali Linux WiFi Adapter

End of the lab!