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Module 07

NETWORK SECURITY CONTROLS - TECHNICAL CONTROLS

CERTIFIED CYBERSECURITY TECHNICIAN

INDEX

Module 07:
Network Security Controls - Technical Controls

LAB SCENARIO

The most important aspect of security controls is the protection of organizational assets such as people, property, and data. By establishing security controls, an organization can either reduce or completely mitigate risks to their assets.

The labs in this module will provide you with a real-time experience in using various methods and techniques used to implement technical controls in the network, thereby, preventing the network from unauthorized access to critical assets and resources.

LAB OBJECTIVE

The objective of this lab is to provide expert knowledge in implementing technical controls. This knowledge is gained through the following tasks:

- Implementation of Host-based firewall protection and Host-based firewall functionality
- Blocking access to unwanted website and insecure ports using pfSense firewall
- Implementation of Host-based IDS functionality and Network-based IDS functionality
- Detecting malicious traffic in the network using HoneyBOT
- Configuring VPN connection using tools such as SoftEther VPN
- Scanning the System for Viruses using Kaspersky Internet Security

OVERVIEW OF TECHNICAL CONTROL

Technical control is referred to as logical controls. It makes use of technology to control access to the physical assets or the facility of the organization. It is generally incorporated in the computer hardware, software, operations, or applications to control access to sensitive areas.

LAB TASKS

A cyber security professional or a security professional use numerous tools and techniques to implement technical controls in the network. Recommended labs that will assist you in learning various aspects of technical controls include the following:

01 Implement Host-based Firewall Protection with iptables

02 Implement Host-based Firewall Functionality using Windows Firewall

03 Implement Network-Based Firewall Functionality: Block Unwanted Website Access using pfSense Firewall

04 Implement Network-Based Firewall Functionality: Block Insecure Ports using pfSense Firewall

05 Implement Host-based IDS Functionality using Wazuh HIDS

06 Implement Network-based IDS Functionality using Suricata IDS

07 Detect Malicious Network Traffic using HoneyBOT

08 Establish Virtual Private Network Connection using SoftEther VPN

09 Scan System for Viruses using Kaspersky Internet Security

Note: Turn on **PfSense Firewall** virtual machine and keep it running throughout the lab exercises.

EXERCISE 1: IMPLEMENT HOST-BASED FIREWALL PROTECTION WITH IPTABLES

iptables is a command-line firewall utility that uses policy chains to allow or block traffic.

LAB SCENARIO

A security professional must know how to configure an iptables host-based firewall to allow or block traffic to or from a Linux system. iptables allows us to enter firewall rules into the existing tables using the command line.

LAB OBJECTIVE

This lab will demonstrate how to configure an iptables host-based firewall in an Ubuntu machine.

OVERVIEW OF IPTABLES

iptables is a standard firewall included in most Linux distributions. With the default chain policies configured, you can start adding rules to iptables, so that it knows what to do when it encounters a connection from or to a particular IP address or port.

LAB TASKS

Note: Ensure that **PfSense Firewall** virtual machine is running.

1. Turn on the **Attacker Machine-1** virtual machine.

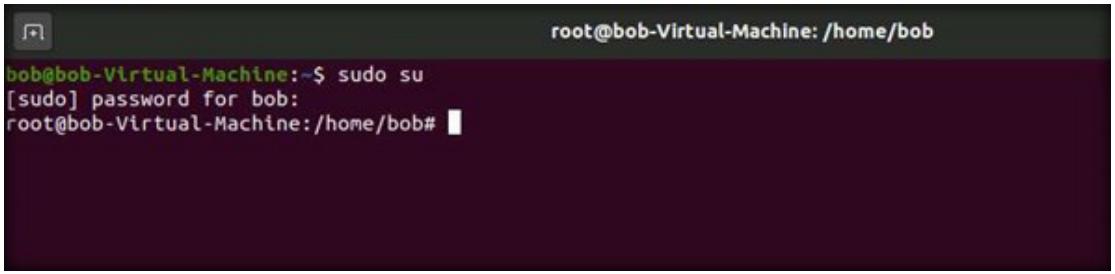
2. Select User **Bob** and type password **user@123** press the **Enter** button.

3. Open the **Firefox** web browser, type **www.google.com** in the URL, and press **Enter**.
   Note: If a notification appears at the top section of a browser window, click **Okay, Got it** and in **Before you continue to Google Search** wizard, click **I agree** button.
   Note: If a **Software Updater** pop-up appears, click on **Remind Me Later**.

4. Bob is able to access the website, which implies that Bob has internet access. A security professional can block internet access on the user machine using iptables.

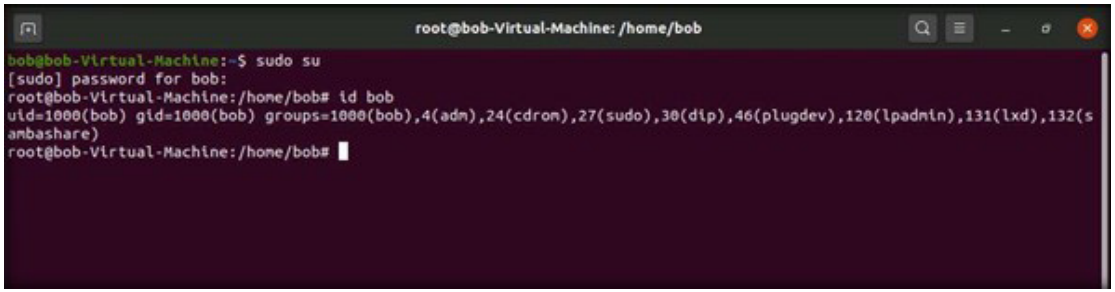
5. Press **ALT + CTL + T** to open the terminal, type the **sudo su** command for the root user, and press Enter.

6. When prompted for the password, type the password for the **root** user (here the root user password is **user@123**), and press **Enter**.
   Note: The password that you type will not be visible.



EXERCISE 1:
IMPLEMENT HOST-BASED
FIREWALL PROTECTION
WITH IPTABLES

7. Next, to identify the user ID for **Bob**, type **id bob** in the terminal and press the **Enter** button. The user id displays as shown in the screenshot

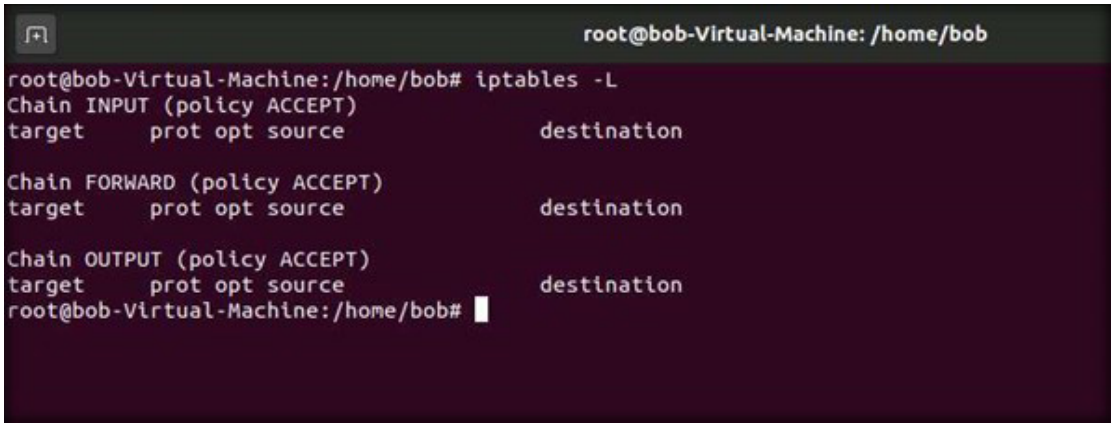


EXERCISE 1:
IMPLEMENT HOST-BASED FIREWALL PROTECTION WITH IPTABLES

8. Note down the user id (uid) for Bob (here 1000).

9. Further, we use the **iptables** command for network management activity.

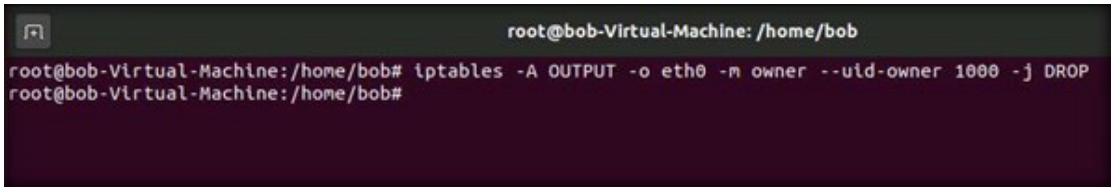
10. Type **iptables -L** and press **Enter** to check the existing rules for users.



EXERCISE 1:
IMPLEMENT HOST-BASED FIREWALL PROTECTION WITH IPTABLES

11. No rules exist currently. Next, we will create a new rule with the following command for the user **Bob**.

12. Type **iptables -A OUTPUT – o eth0 -m owner --uid-owner 1000 -j DROP** as shown in the screenshot below, and press **Enter**.



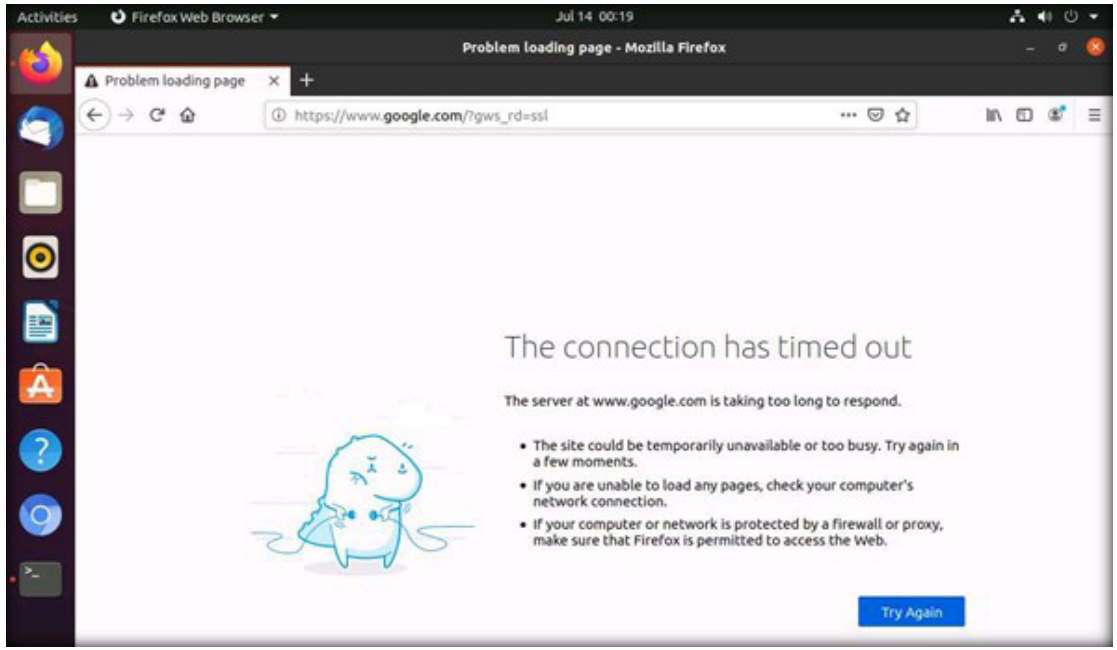
EXERCISE 1:
IMPLEMENT HOST-BASED FIREWALL PROTECTION WITH IPTABLES

13. The rule will be applicable only for the user Bob who has 1000 as the UID, as we have already noted.

14. Test the Internet connection to check whether or not the iptables rule is applied.

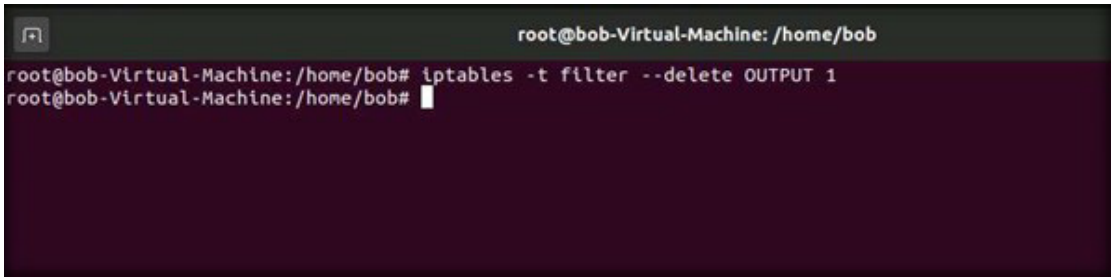
15. Open the browser, type **www.google.com**, and press the **Enter** button.

16. As the screenshot below shows, the website is not accessible to the user.



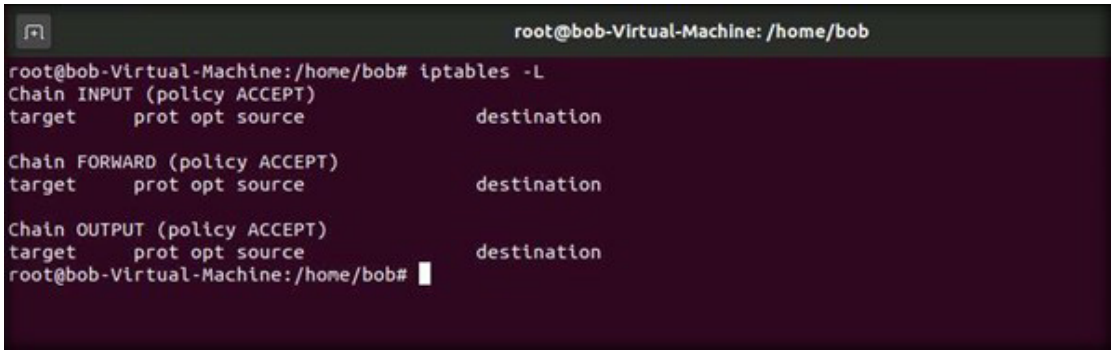
EXERCISE 1:
IMPLEMENT HOST-BASED FIREWALL PROTECTION WITH IPTABLES

17. Now switch back to the terminal window, type **iptables -t filter --delete OUTPUT 1** in the terminal window and press **Enter**.



EXERCISE 1:
IMPLEMENT HOST-BASED
FIREWALL PROTECTION
WITH IPTABLES

18. This will delete the rule that was created in **step 12** and to enable Internet connection to user **Bob**, to check the rule type **iptables -L** and press **Enter**.

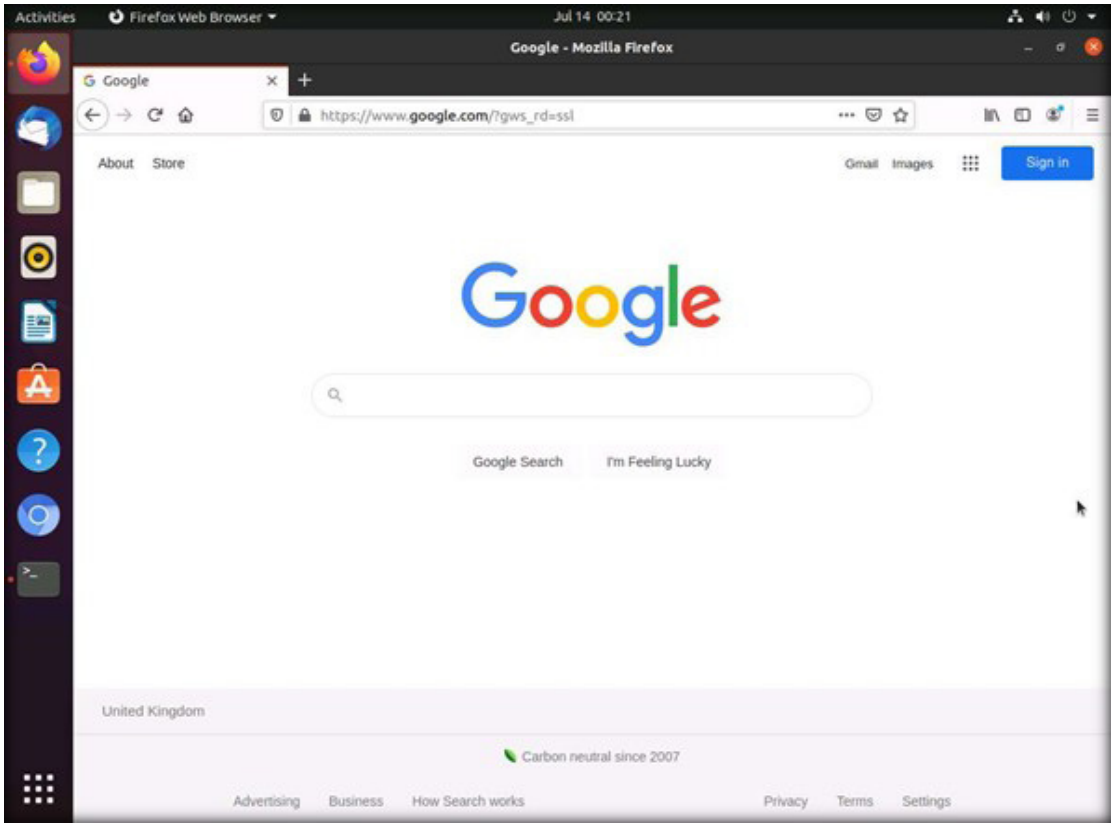


EXERCISE 1:
IMPLEMENT HOST-BASED FIREWALL PROTECTION WITH IPTABLES

19. No rules exist currently, we have successfully deleted the rule, now we will check for connectivity.

20. Open the browser, type **www.google.com**, and press the **Enter** button.

EXERCISE 1:
IMPLEMENT HOST-BASED FIREWALL PROTECTION WITH IPTABLES



EXERCISE 2: IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

A host-based firewall protects the system from various threats.

LAB SCENARIO

A security professional must have the required knowledge to implement various security layers in the organization; a single breach in security can allow the attacker to leave malicious code or transfer the malicious file over the network. Host-based firewall implementation is another security layer where the administrator can allow or restrict specific individual endpoints. In this lab, you will learn how to configure a host-based firewall to protect the individual system connected to the network.

LAB OBJECTIVE

This lab will demonstrate how to secure an individual endpoint within the network. In this lab, you will learn how to do the following:

- Hardening the host within the network
- Applying rules in a host-based firewall

OVERVIEW OF A HOST-BASED FIREWALL

A host-based firewall is a software that makes the system or device secure. Configuring a host-based firewall will help achieve real security implementation and defense in depth within an organization. The normal strategy of a host-based firewall is to provide defense-in-depth and use a combination of layers of protection within the organization.

An example is the Windows firewall, which is inbuilt in the Windows platform. The Windows firewall developed by Microsoft Windows is an application that filters the incoming and outgoing Internet traffic and blocks the malicious program communicating to the individual endpoint. The Windows firewall (host-based) protects the individual endpoint over the network from various threats, viruses, and malware.

LAB TASKS

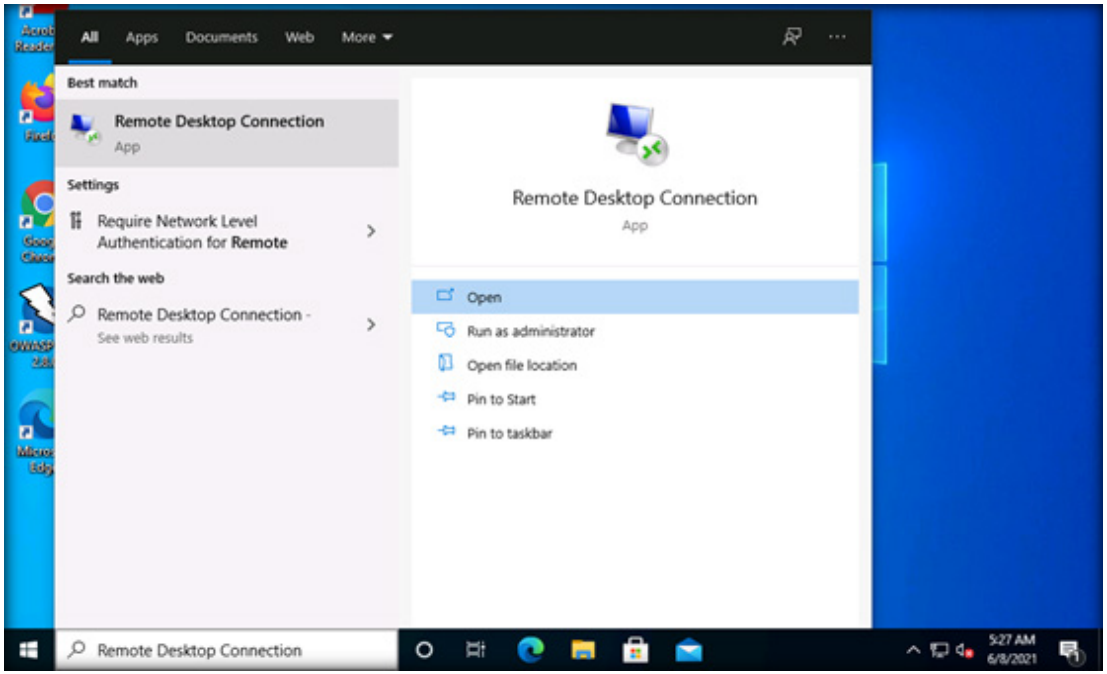
Note: Ensure that **PfSense Firewall** virtual machine is running.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

1. Turn on **Admin Machine-1** and **Web Server** virtual machines.

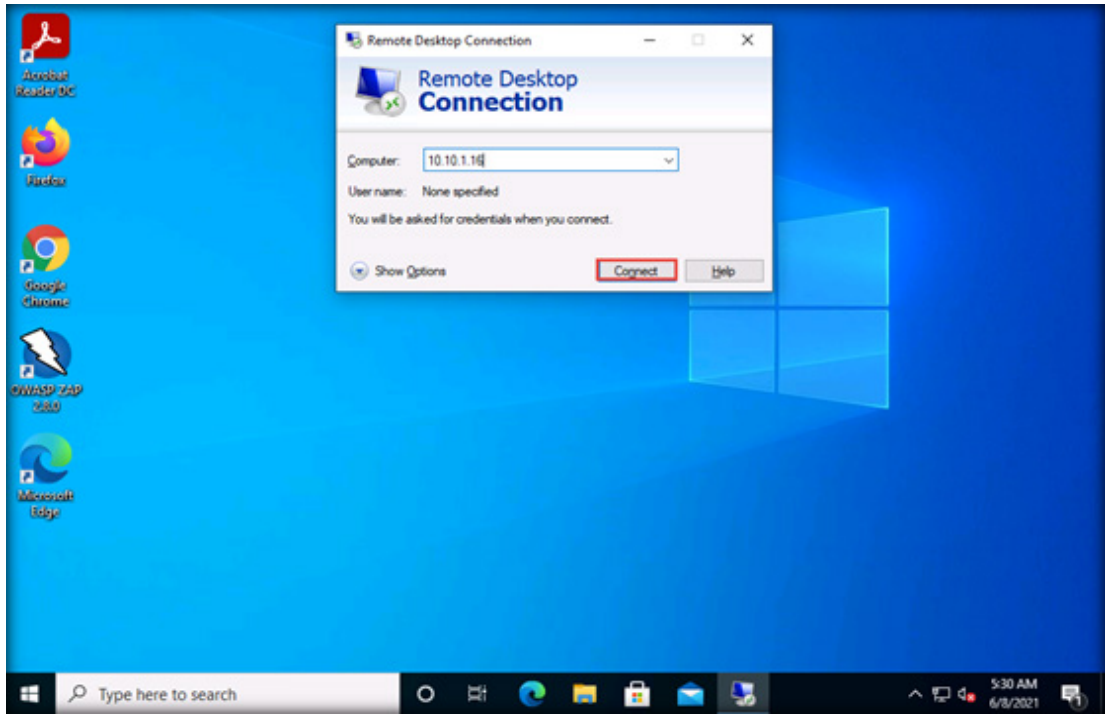
2. In the **Admin Machine-1** virtual machine, log in with the credentials **Admin** and **admin@123**.
   Note: If the network screen appears, click **Yes**.

3. Navigate to the **Windows Start** menu, type **Remote Desktop Connection**, and press **Enter**.



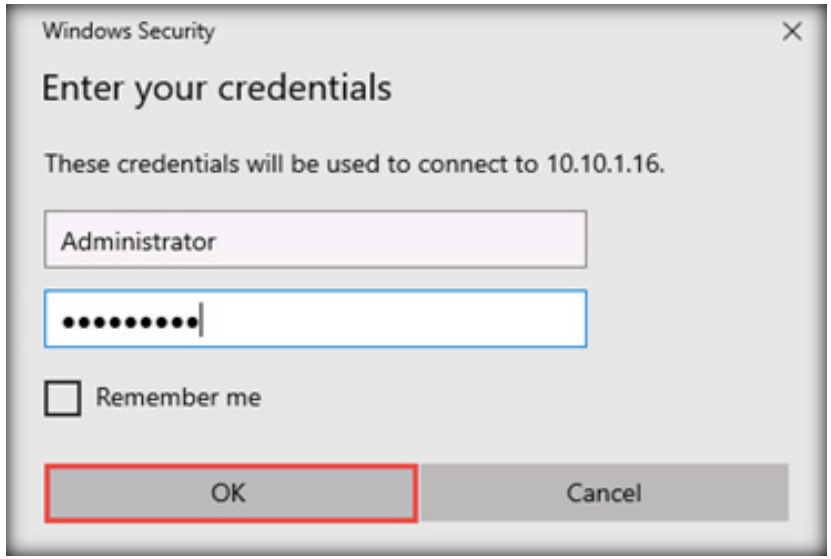
4. The **Remote Desktop Connection** window will appear as shown in the screenshot below. Type the 1**0.10.1.16** IP address of the **Web Server** machine and click **Connect**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



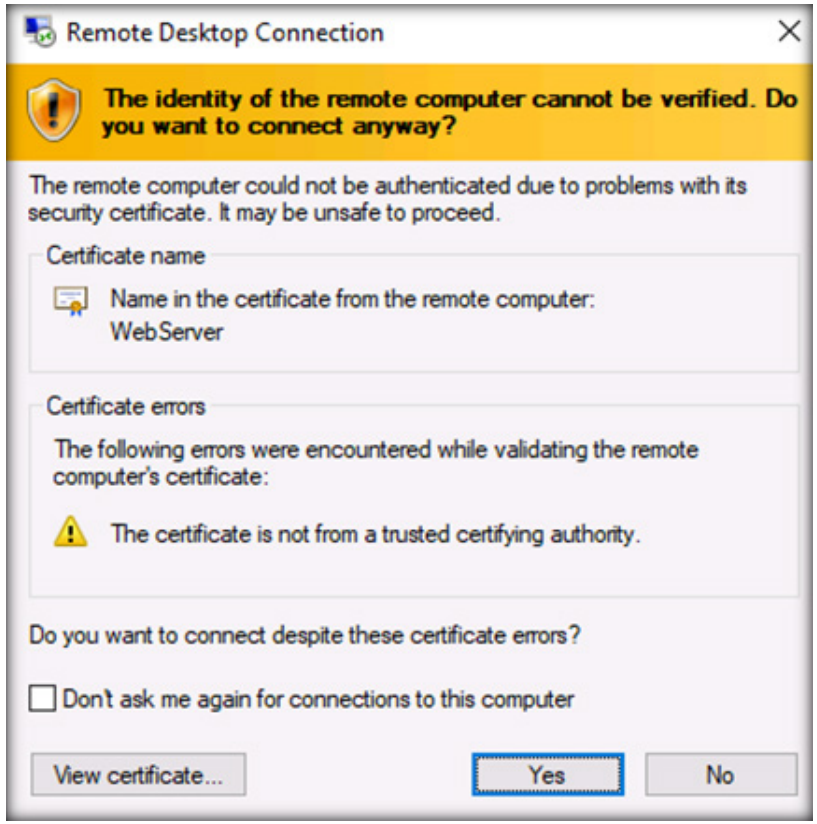
5. The **Windows Security** pop-up window will appear. Type the username **Administrator** and password **admin@123**, and click **OK**

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



6. The **Security Certificate** pop-up will appear as shown in the screenshot below. Click **Yes**.

EXERCISE 2: IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

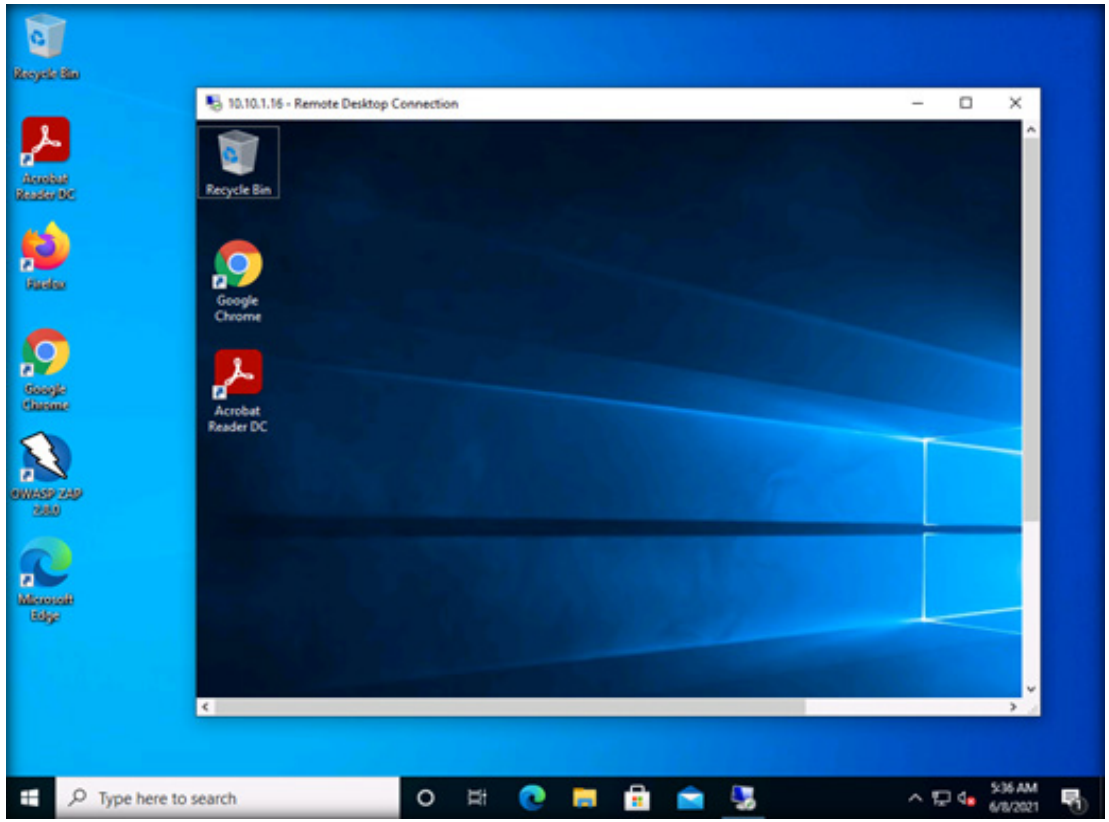


7. After clicking Yes, the **Web Server** virtual machine will appear as **10.10.1.16** – Remote Desktop Connection in the **Admin Machine-1**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

8. Click **Restore down** button of Remote Desktop window, to view connected desktop properly.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



9. In the previous task, we were able to access the Windows machine remotely because there was no restriction for the individual system; therefore, another machine can access this machine remotely. A security professional needs to apply a host-based firewall on an individual machine to prevent the machine from being accessed remotely.

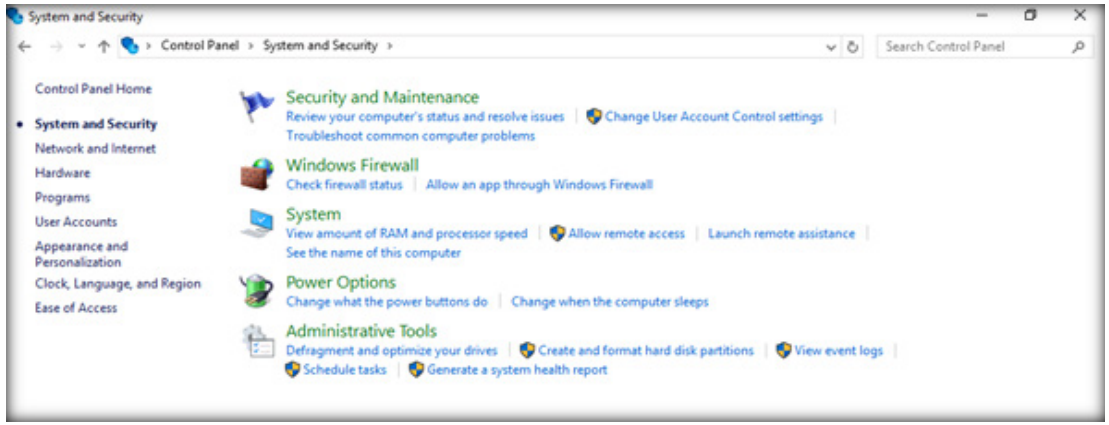
10. Switch to the **Web Server** virtual machine.

11. Login with the credentials **Administrator** and **admin@123**.

12. Open **Control Panel**.

13. Click the **System and Security** option.

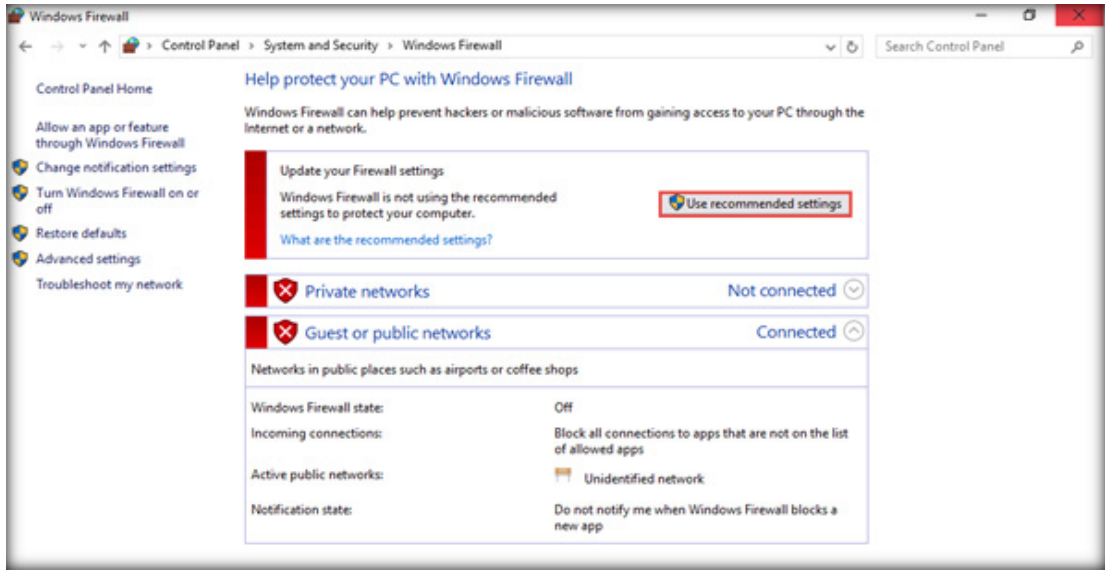
14. The **System and Security** windows will appear. Click **Windows Firewall**.



EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

15. The **Windows Firewall** window opens. Click **Use recommended settings**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

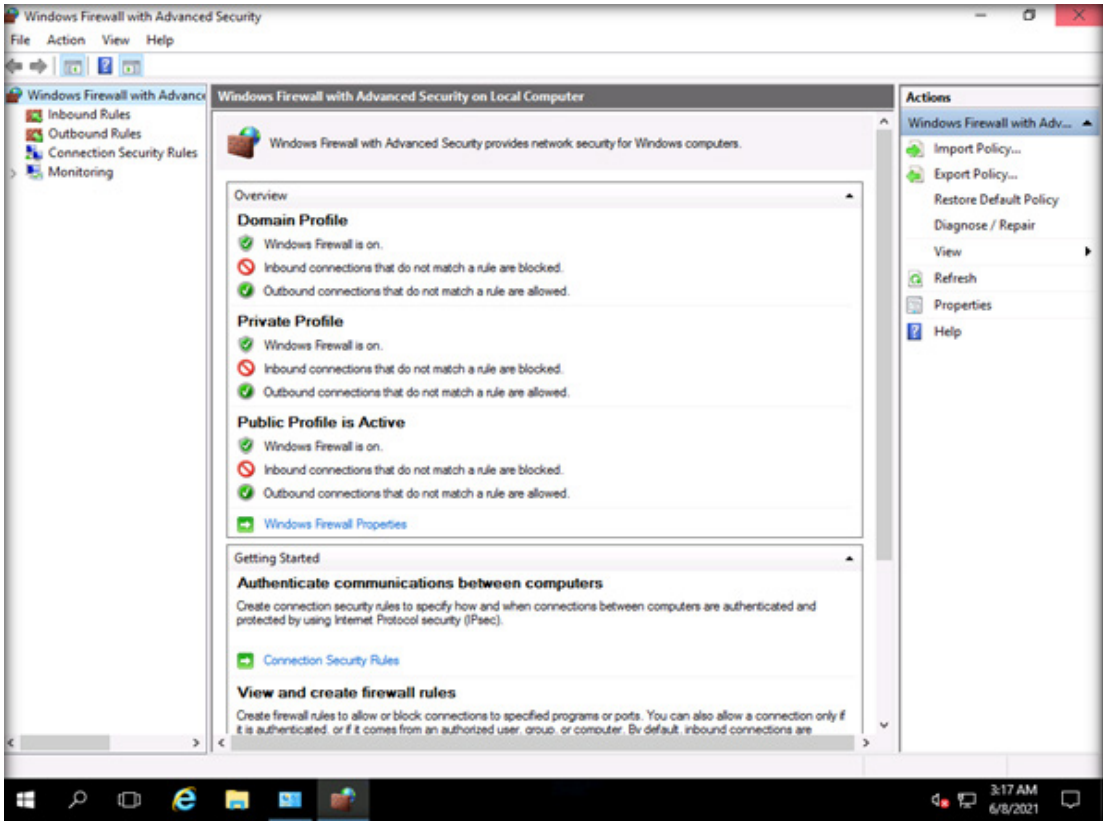


16. The **Windows Defender Firewall** is turned on for **Domain, Private,** and **Guest or Public** network settings as shown in the screenshot below.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

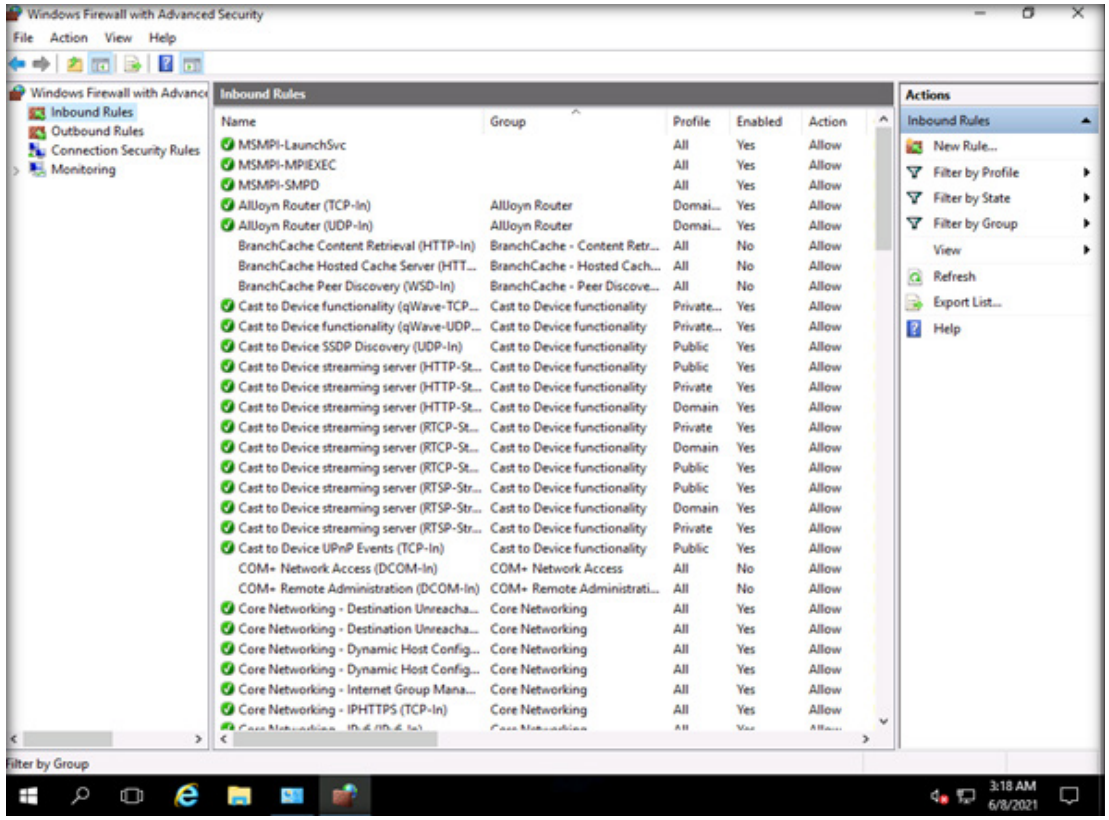
17. Click **Advanced Settings** in the left pane. The **Windows Firewall with Advanced Security** window opens.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



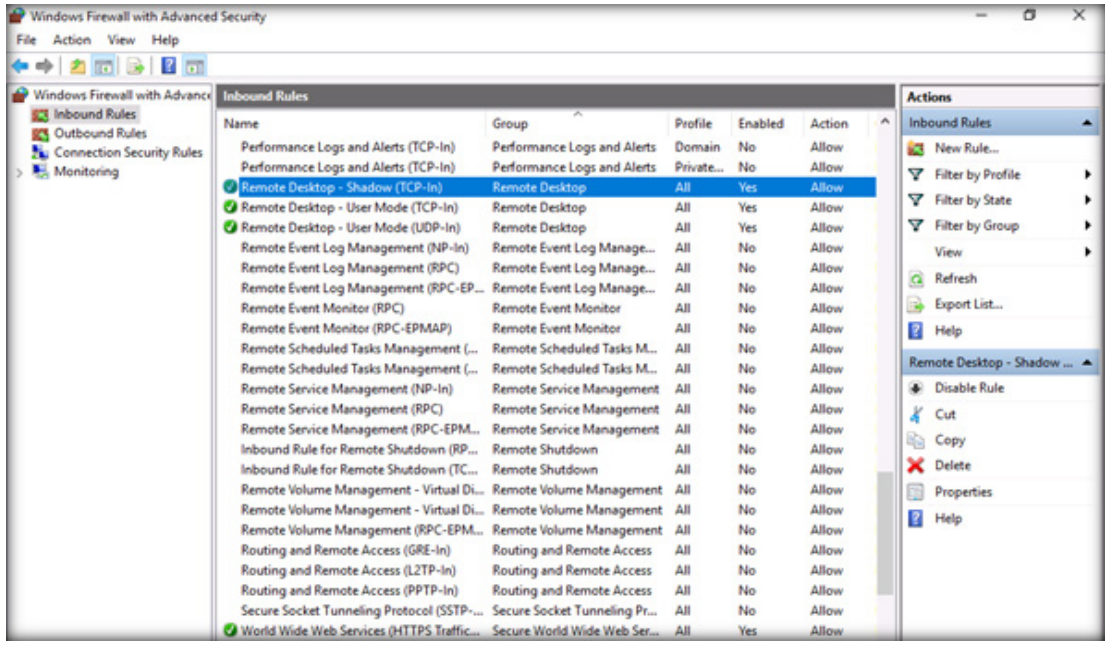
18. Click **Inbound Rules** option in the left side pane. The list of rules appears.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



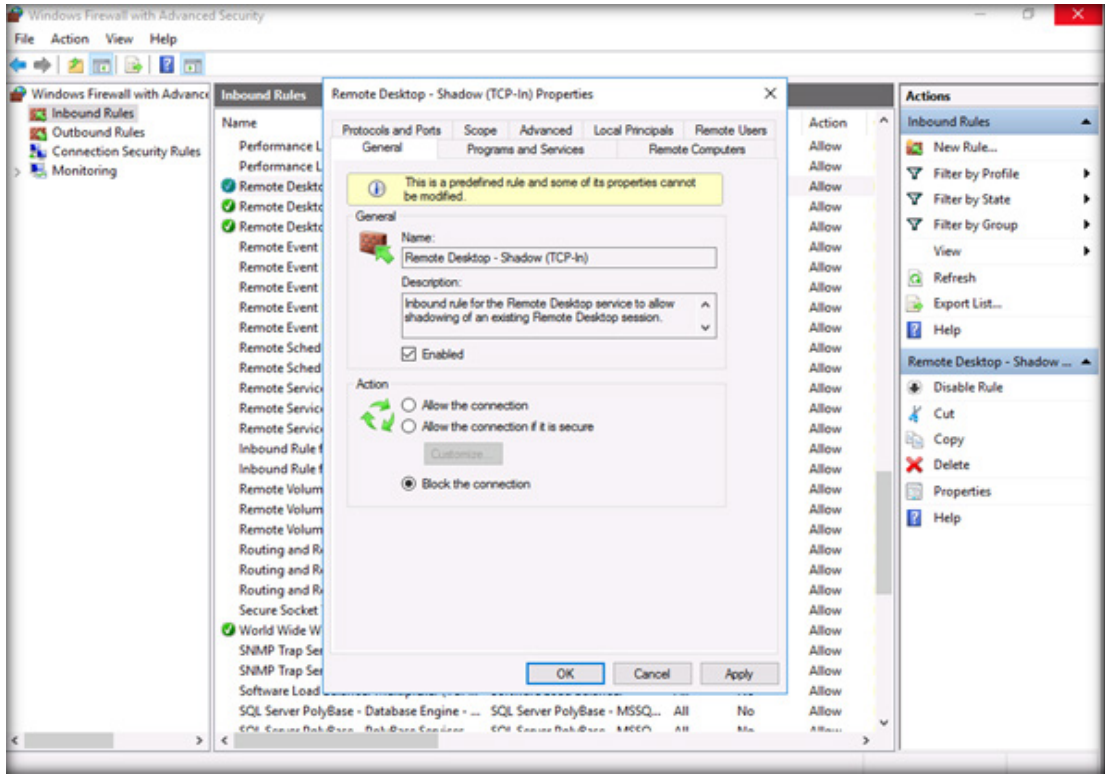
19. Search for **Remote Desktop- Shadow (TCP-In)** and double-click.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



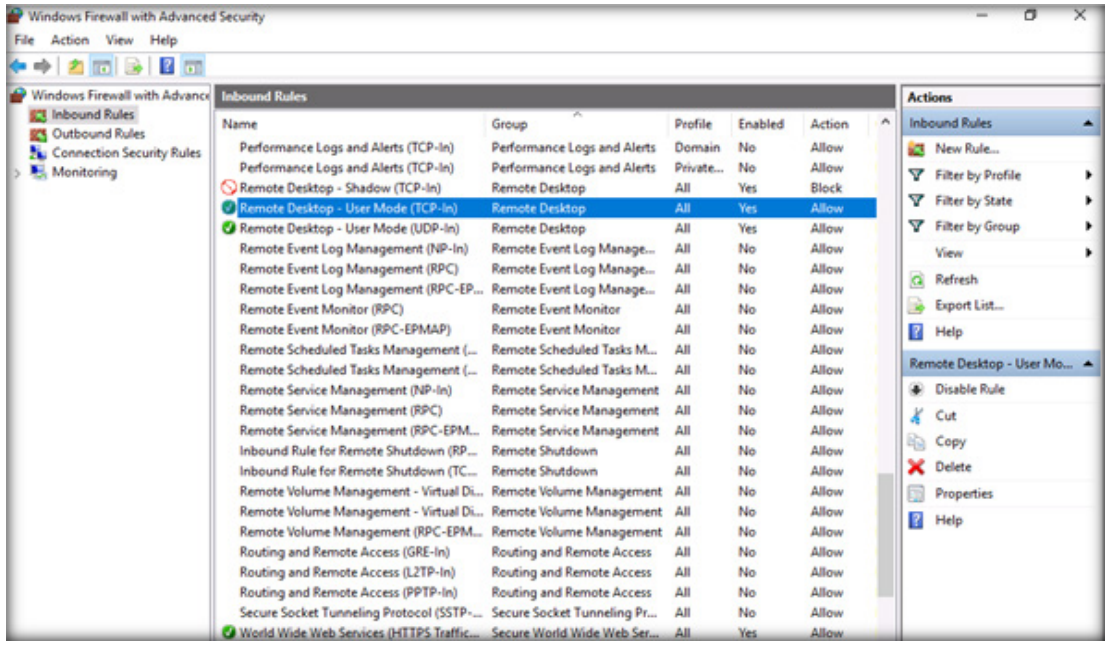
20. The **Remote Desktop- Shadow (TCP-in) Properties** window opens. Check radio button **Block the connection** and click **OK**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



21. Next, search for **Remote Desktop- User Mode (TCP-In)** and double-click.

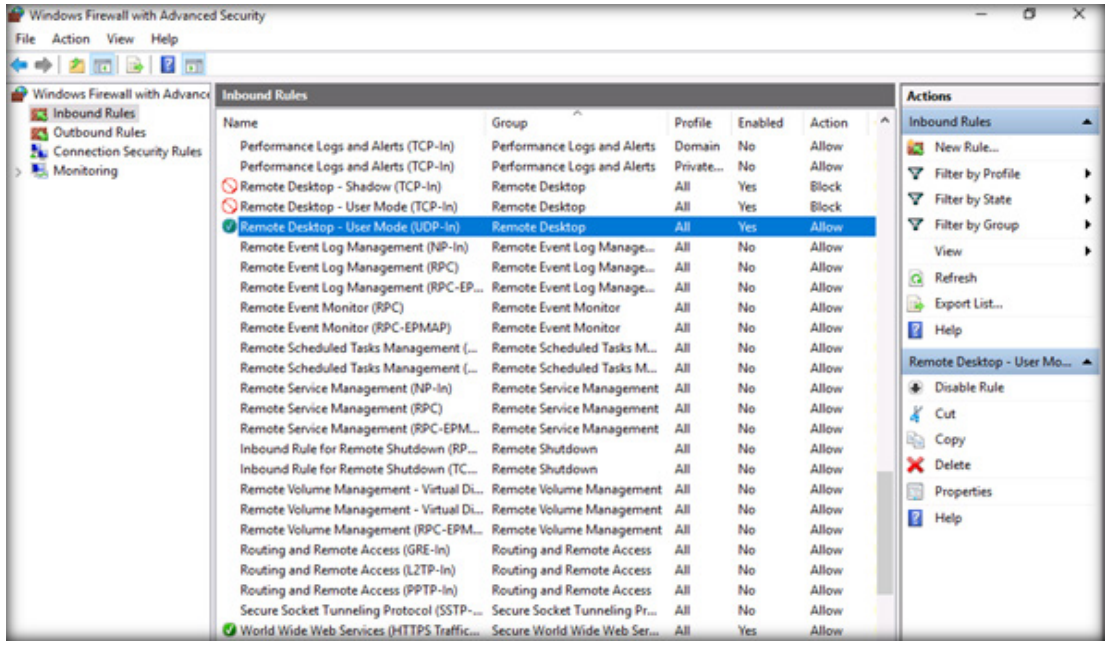
EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



22. The **Remote Desktop- User Mode (TCP-in) Properties** window opens. Check radio button **Block the connection** and click **OK**.

23. Next, search for **Remote Desktop- User Mode (UDP-In)** and double-click.

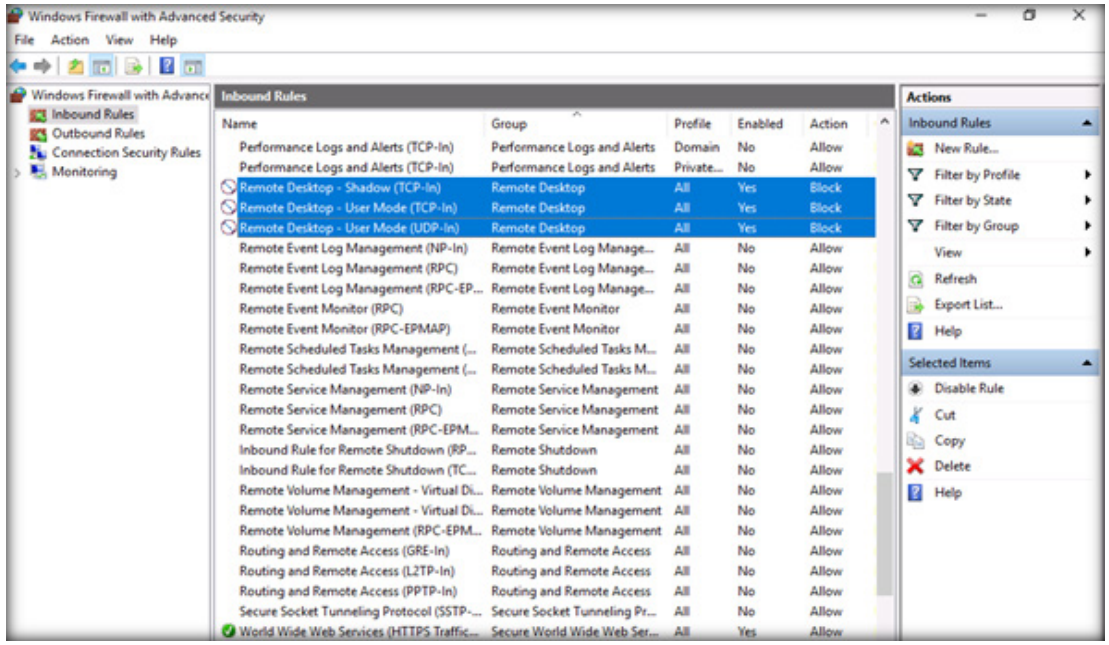
EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



24. The **Remote Desktop- User Mode (UDP-in) Properties** window opens. Check radio button **Block the connection** and click **OK**.

25. Now, we have blocked Remote Desktop inbound connections. Let us verify this.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

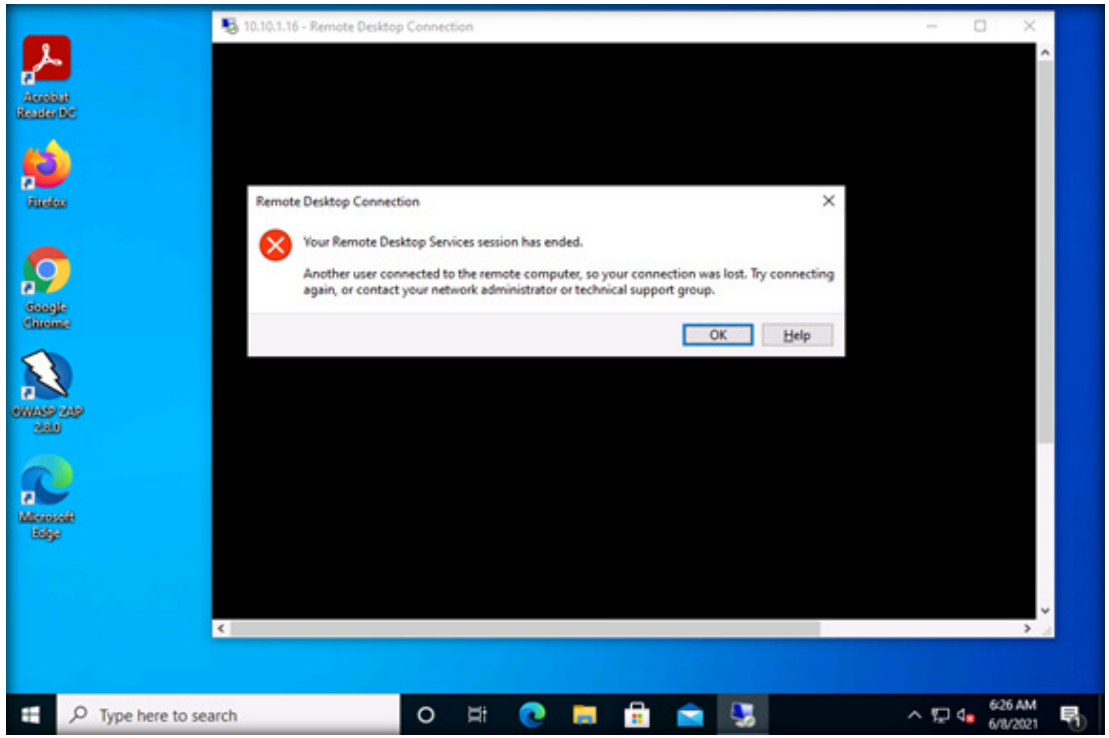


26. Close all open windows.

27. Switch back to the **Admin Machine-1** virtual machine.

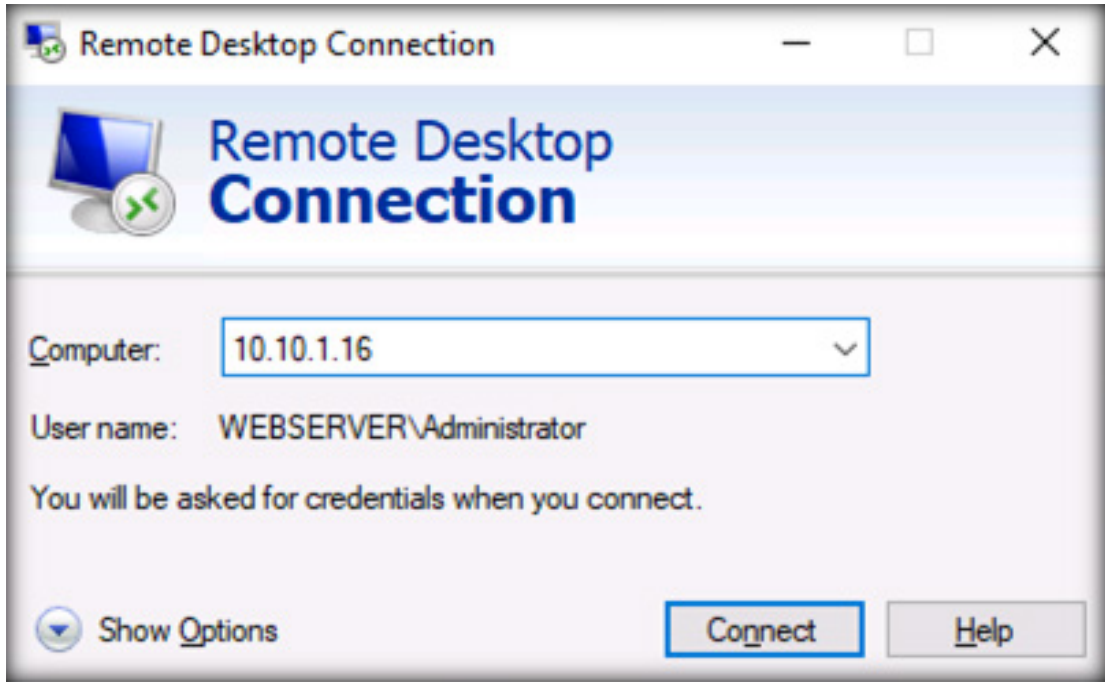
28. The previous session will end. Click **OK**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



29. Next, try to access **Web Server** machine remotely. Type the **10.10.1.16** IP address of the **Web Server** machine in opened Remote Desktop connection window and click **Connect**.

EXERCISE 2: IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

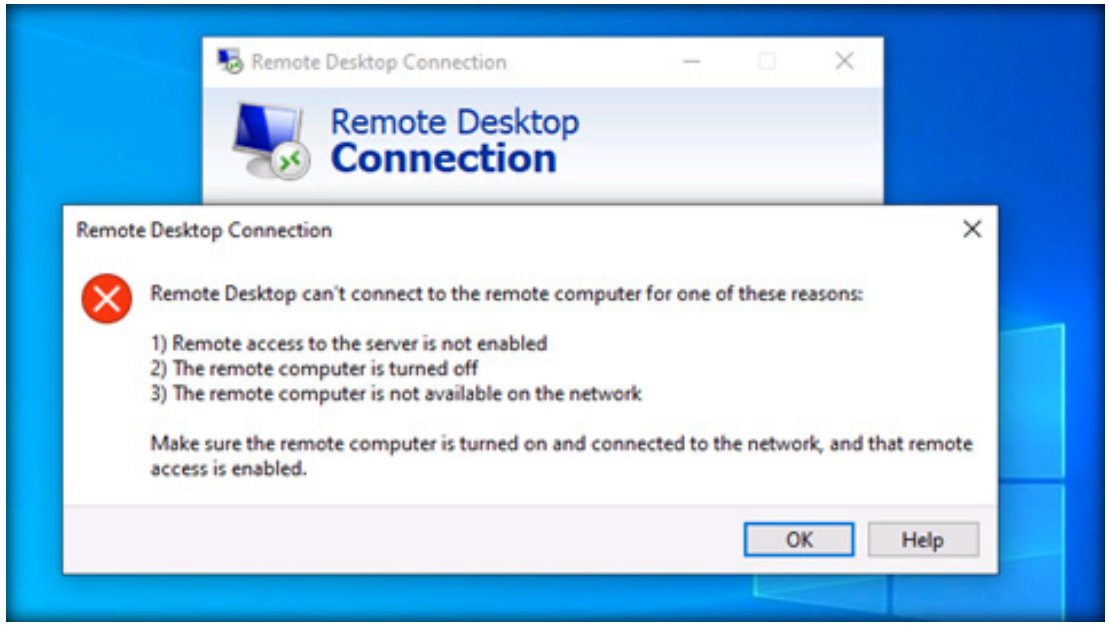


30. This time, you will not be able to connect the Remote Desktop for **10.10.1.16**.

31. The host-based Windows firewall on host **10.10.1.16** will not allow the other host (Admin Machine-1) to communicate with unchecked programs listed in the allowed app of the firewall in Web Server host **(10.10.1.16)**.

32. You will get the error message shown in the screenshot below.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



33. Close the **Remote Desktop Connection** window. Now we will try to connect to Web Server using FTP connection.

34. Switch to the **Web Server** virtual machine.

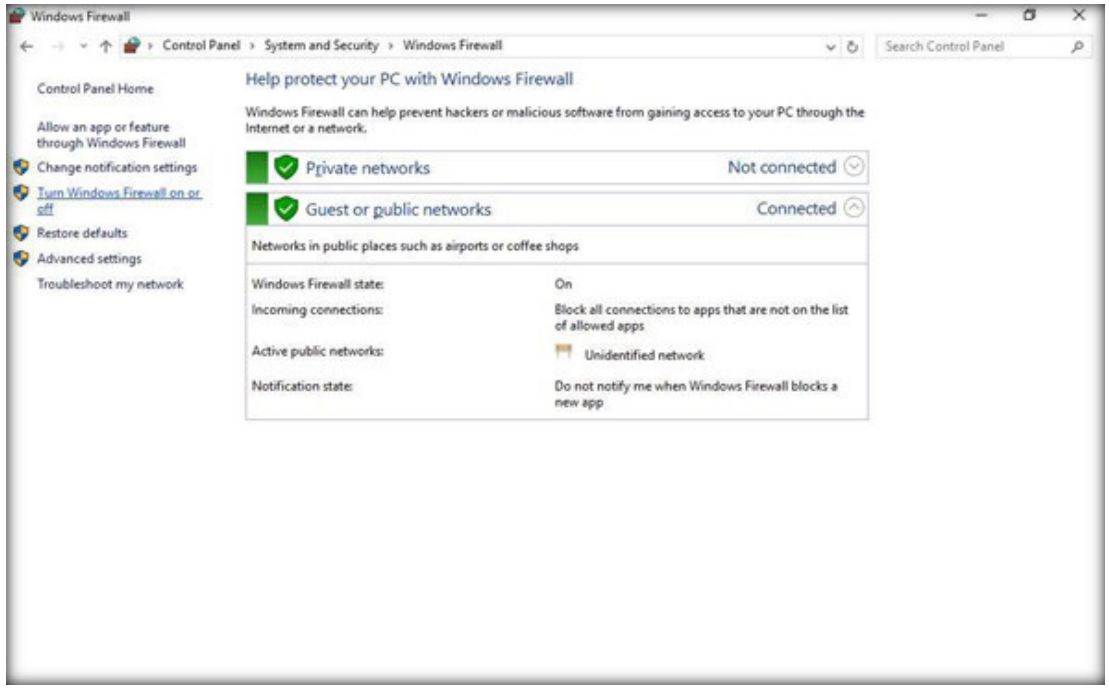
35. Open **Control Panel**.

36. Click the **System and Security** option.

37. The **System and Security** windows will appear. Click **Windows Firewall.**

38. The **Windows Firewall** window opens. Click **Turn Windows Firewall on or off**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



39. In the **Customize Settings** window select **Turn off Windows Firewall** under Private and Public networks and click **OK**.

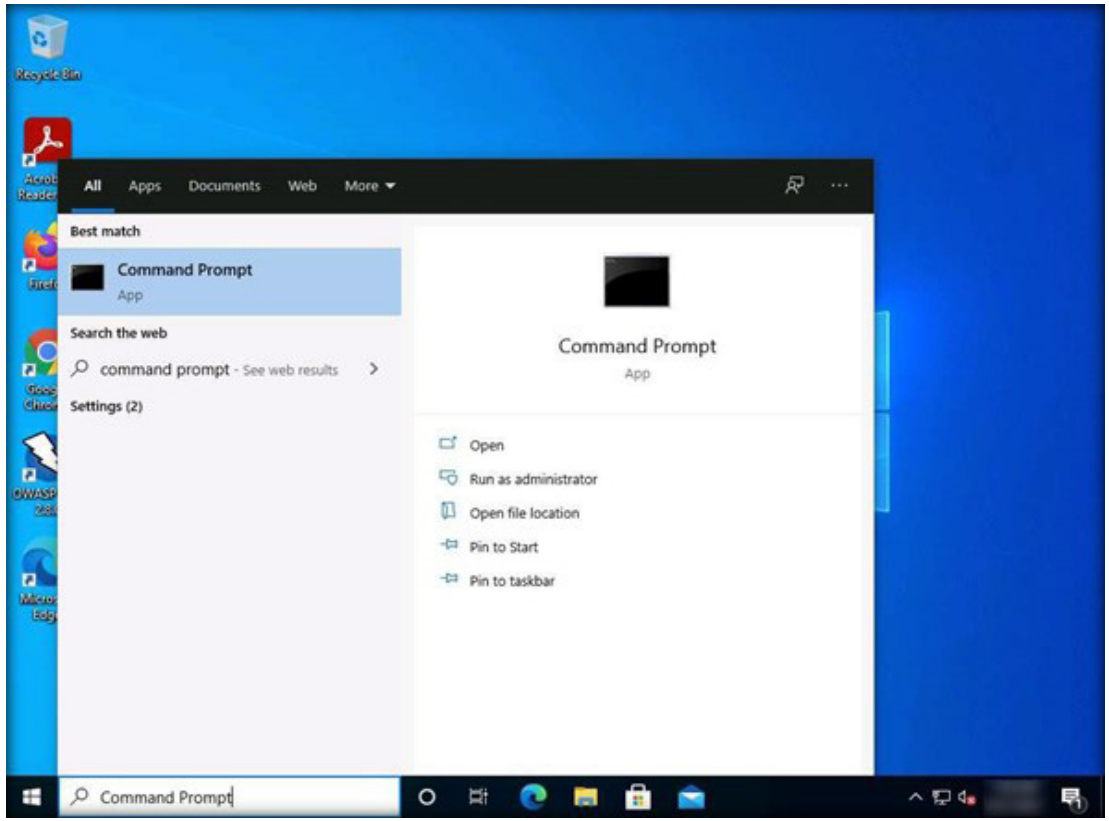
EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

40. Close all open windows.

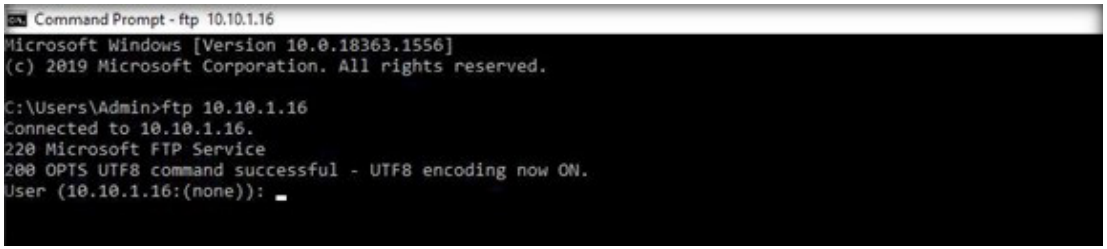
41. Switch to the **Admin Machine-1** virtual machine.

42. Navigate to the **Windows Start** menu, type **Command Prompt**, and press **Enter** to open a Command Prompt window.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



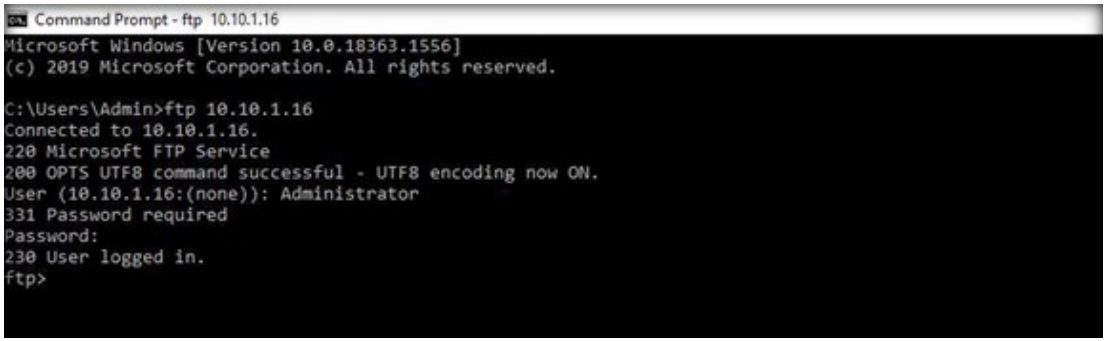
43. In the **Command Prompt** window type **ftp 10.10.1.16**. It will ask for Username and Password for Login.



EXERCISE 2: IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

44. Enter **Administrator** in the User field and **admin@123** in the Password field to login to ftp. You will be successfully logged in to ftp.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



45. Close the **Command Prompt** window.

46. Switch to the **Web Server** virtual machine.

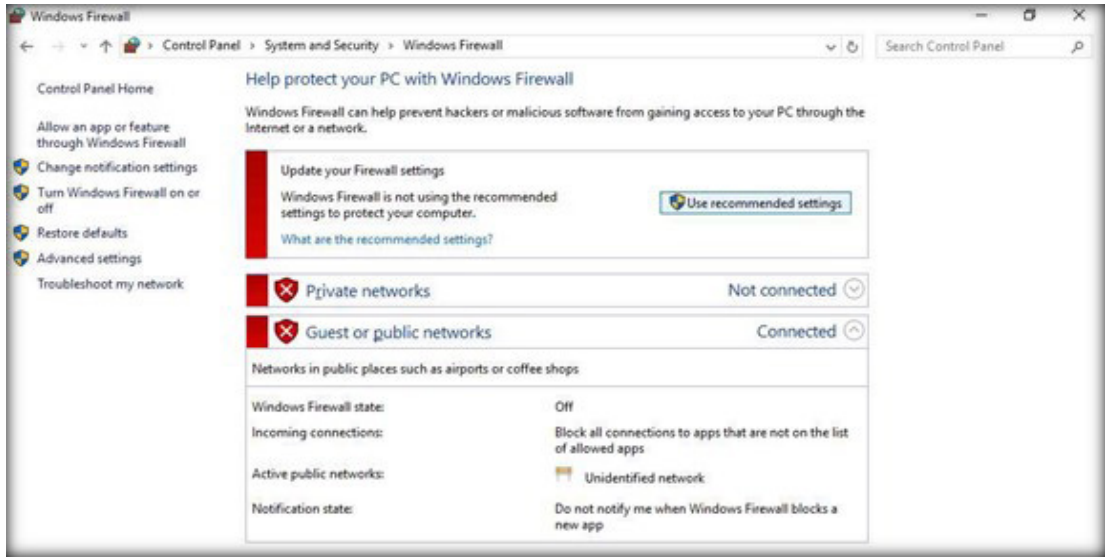
47. Open **Control Panel**.

48. Click the **System and Security** option.

49. The **System and Security** windows will appear. Click **Windows Firewall**.

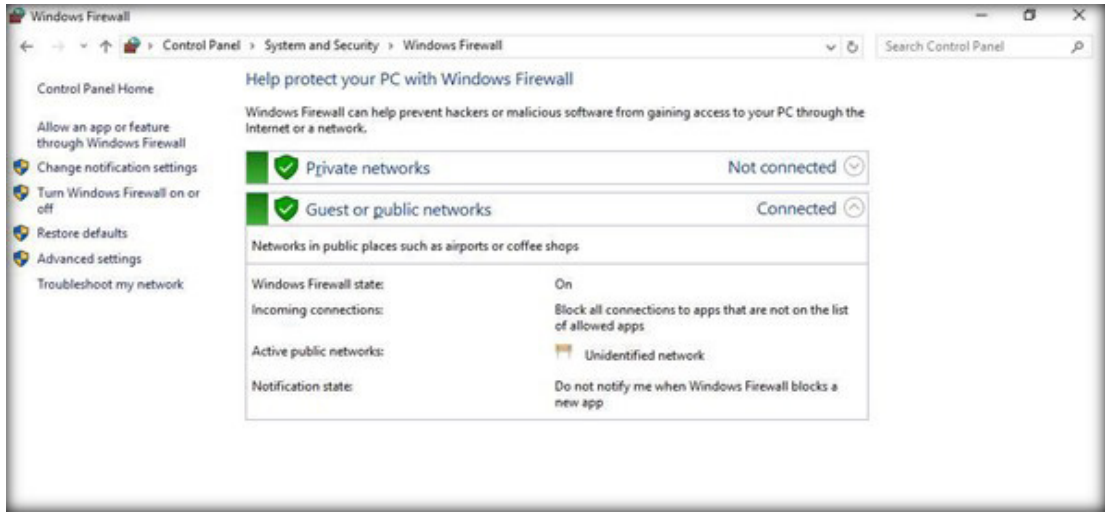
50. The **Windows Firewall** window opens. Click **Use recommended settings**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



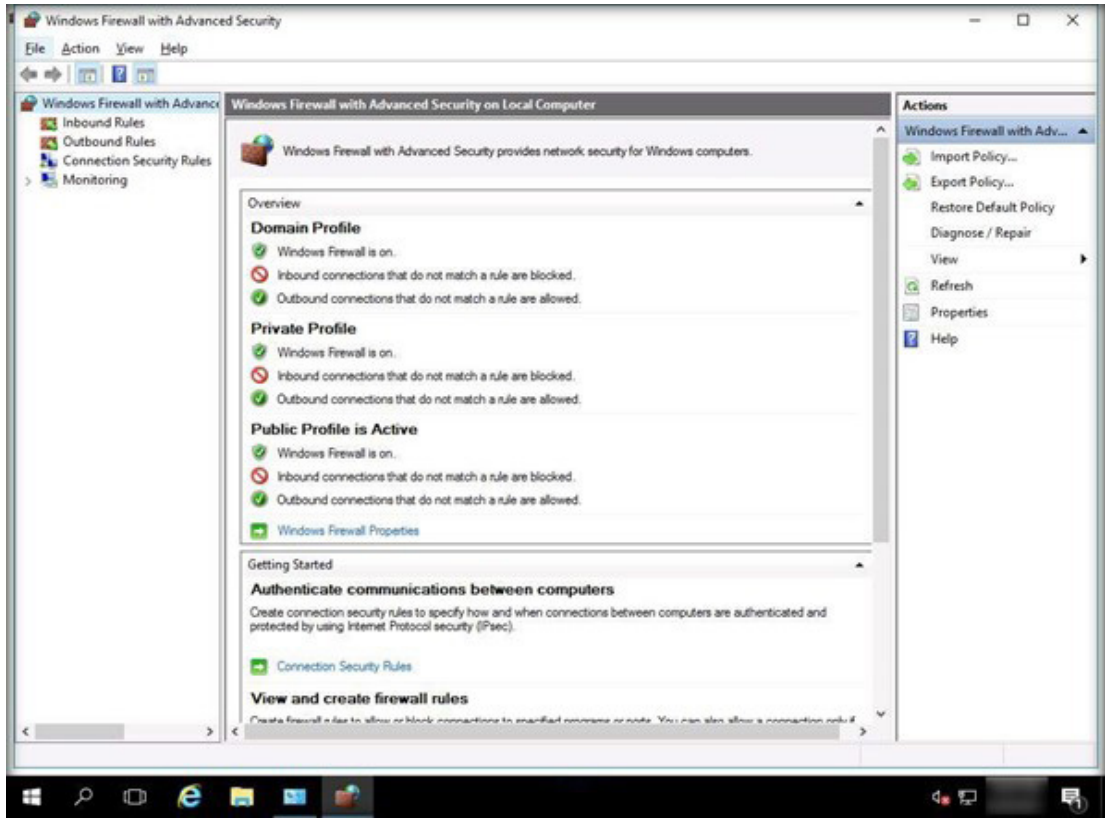
51. The **Windows Defender Firewall** is turned on for **Domain, Private**, and **Guest or Public** network settings as shown in the screenshot below.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



52. Click **Advanced Settings** in the left pane. The **Windows Firewall with Advanced Security** window opens.

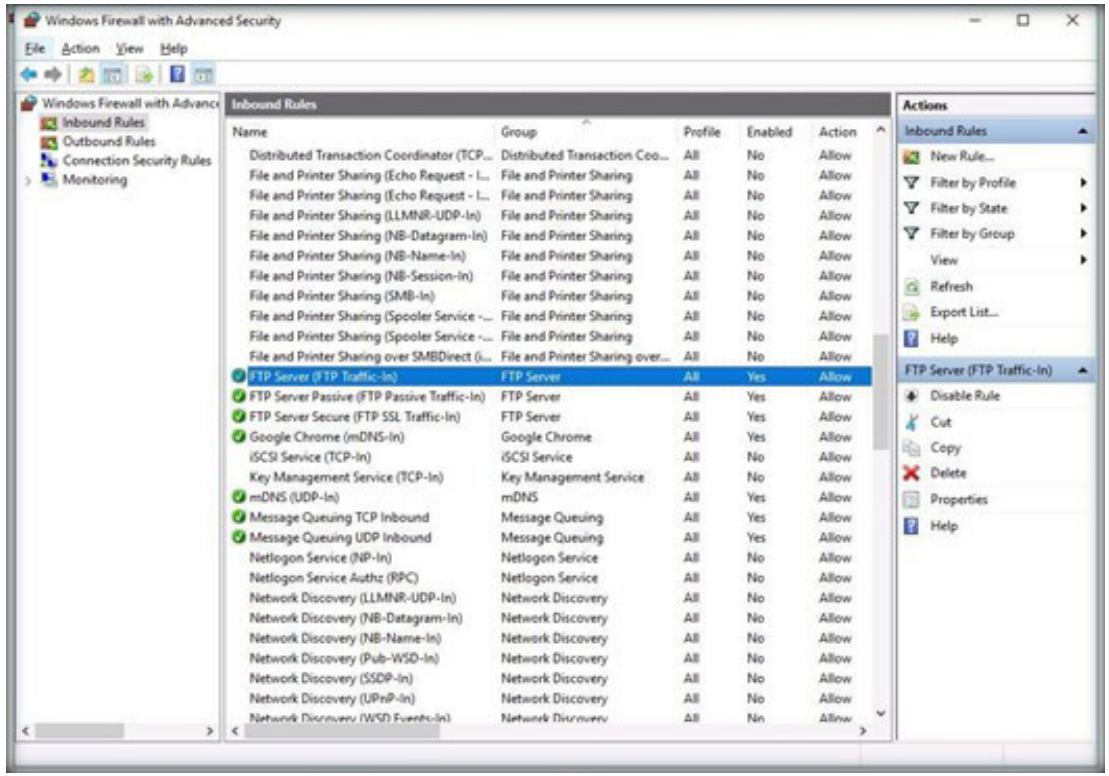
EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



53. Click **Inbound Rules** option in the left side pane. The list of rules appears.

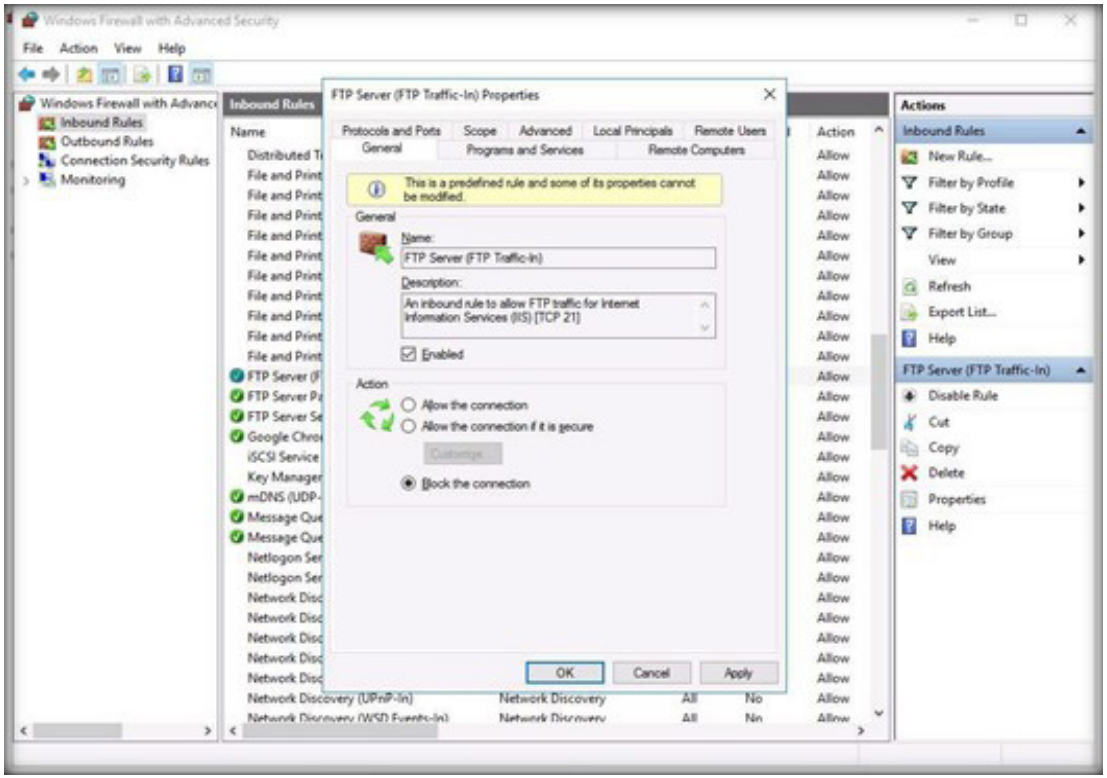
54. Search for **FTP Server (FTP Traffic-In)** and double-click.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



55. The **FTP Server (FTP Traffic-In) Properties** window opens. Check radio button **Block the connection** and click **OK**.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



56. Next, search for **FTP Server Passive (FTP Passive Traffic-In)** and double-click.

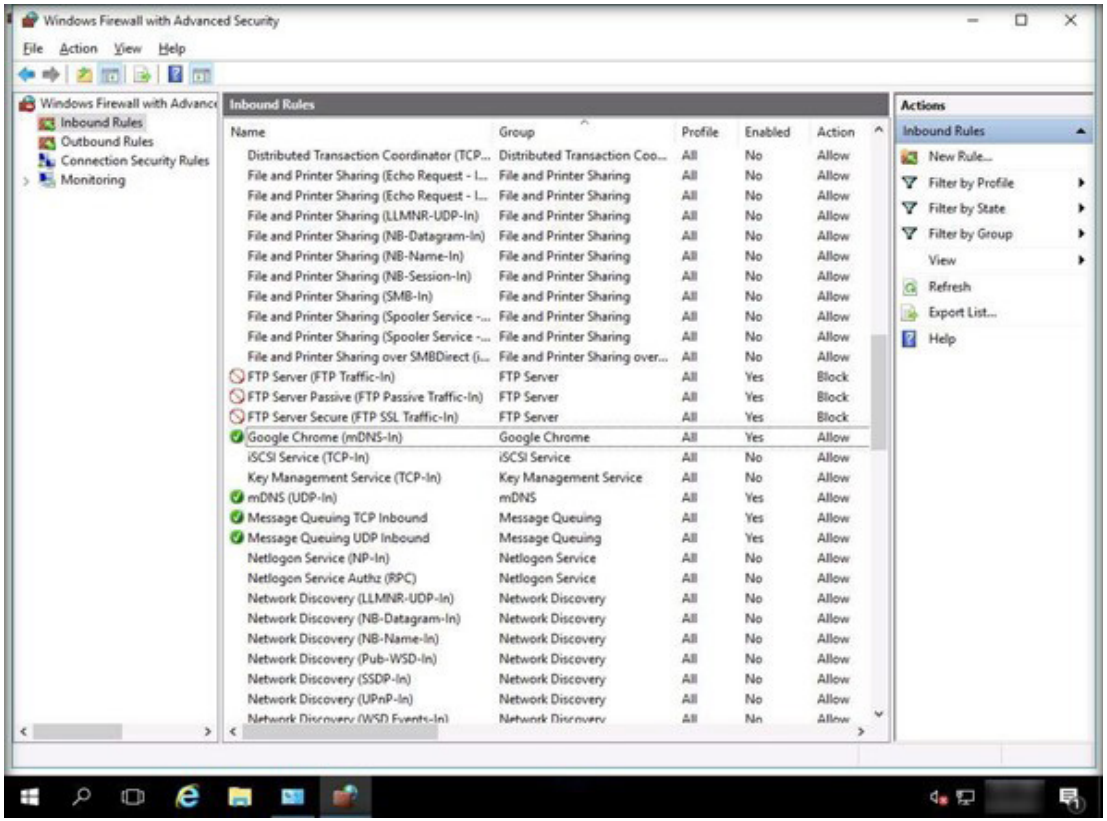
57. The **FTP Server Passive (FTP Passive Traffic-In) Properties** window opens. Check radio button **Block the connection** and click **OK**.

58. Next, search for **FTP Server Secure (FTP SSL Traffic-In)** and double-click.

59. The **FTP Server Secure (FTP SSL Traffic-In) Properties** window opens. Check radio button **Block the connection** and click **OK**.

60. Now, we have blocked FTP inbound connection. Let us verify this.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

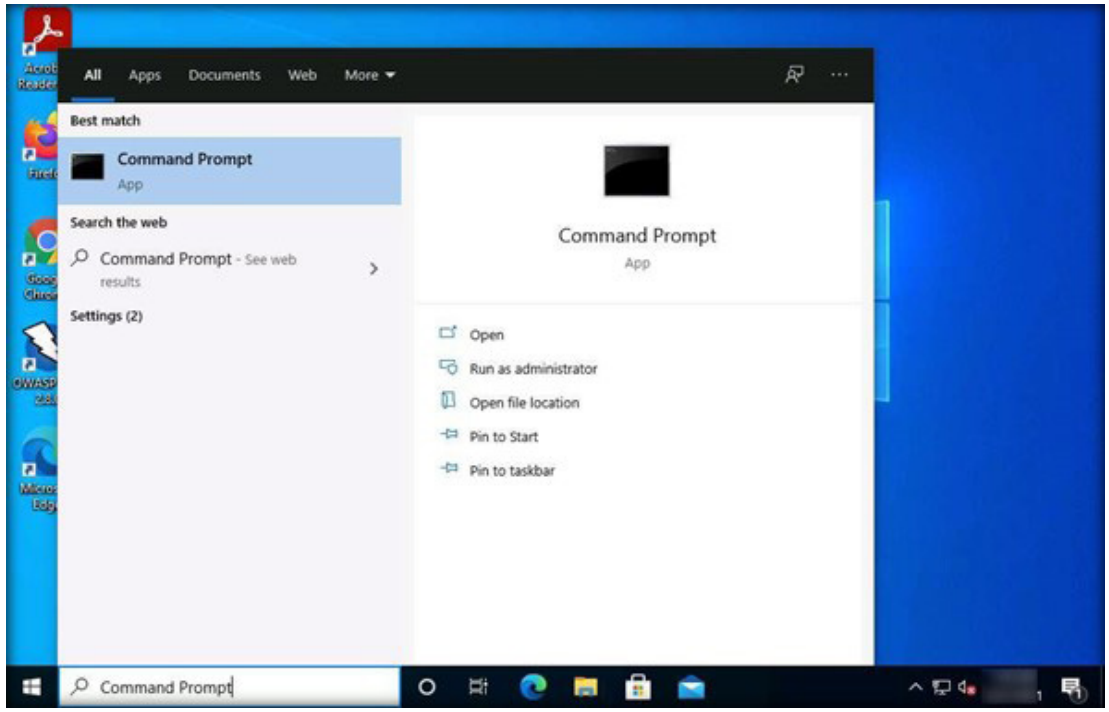


61. Close all open windows.

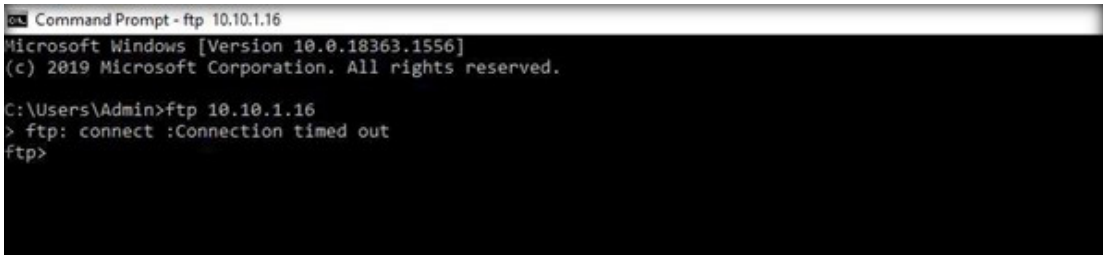
62. Switch to the **Admin Machine-1** virtual machine.

63. Navigate to the **Windows Start** menu, type **Command Prompt**, and press **Enter** to open a Command Prompt window.

EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL



64. In the **Command Prompt** window type **ftp 10.10.1.16**, We will get **Connection timed out** error message.
Note: It might take a while for the error message to appear.



EXERCISE 2:
IMPLEMENT HOST-BASED FIREWALL FUNCTIONALITY USING WINDOWS FIREWALL

65. We have successfully blocked the FTP connection to **Web Server**.

66. Switch to the Web Server virtual machine. Navigate to **Control Panel > System and Security > Windows Firewall** and follow **step 53** to **step 60** and click on **Allow the connection** in the **FTP Server (FTP Traffic-In) Properties, FTP Server Passive (FTP Passive Traffic-IN) Properties** and **FTP Server Secure (FTP SSL Traffic-In)** Properties windows.

67. Follow **steps 35** to **step 40** to turn off the firewall in **Web Server** virtual machine.

68. Close all open windows.

EXERCISE 3: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL

The pfSense firewall/router is the world's most trusted open-source network security solution software.

LAB SCENARIO

To prevent users from visiting malicious websites and to secure against phishing attacks, security professionals must block known malicious websites and protect the network from various viruses and malware. As a security measure organizations need to prevent employees from accessing unwanted websites for employees.

LAB OBJECTIVE

The lab will demonstrate how to use the pfSense firewall alias to block access to unwanted websites. If we implement one rule per host, the number of rules will be greater and more difficult to manage. Using an alias for multiple hosts requires the use of only one rule.

OVERVIEW OF PFSENSE FIREWALL

pfSense is a free, open-source Operating System that functions like a firewall, intrusion detection system, and router. Firewall features are integrated into pfSense, and it contains basic firewall rules and firewall logs. A security professional can use the pfSense firewall to manage network security easily.

Aliases act as placeholders for real hosts, networks, or ports and help in reducing the number of changes required when the host, network, or port changes. The name of an alias can be used instead of specifying the host, network, or port for defining firewall rules.

LAB TASKS

Note: Ensure that **Admin Machine-1, Web Server** and **PfSense Firewall** virtual machines are running.

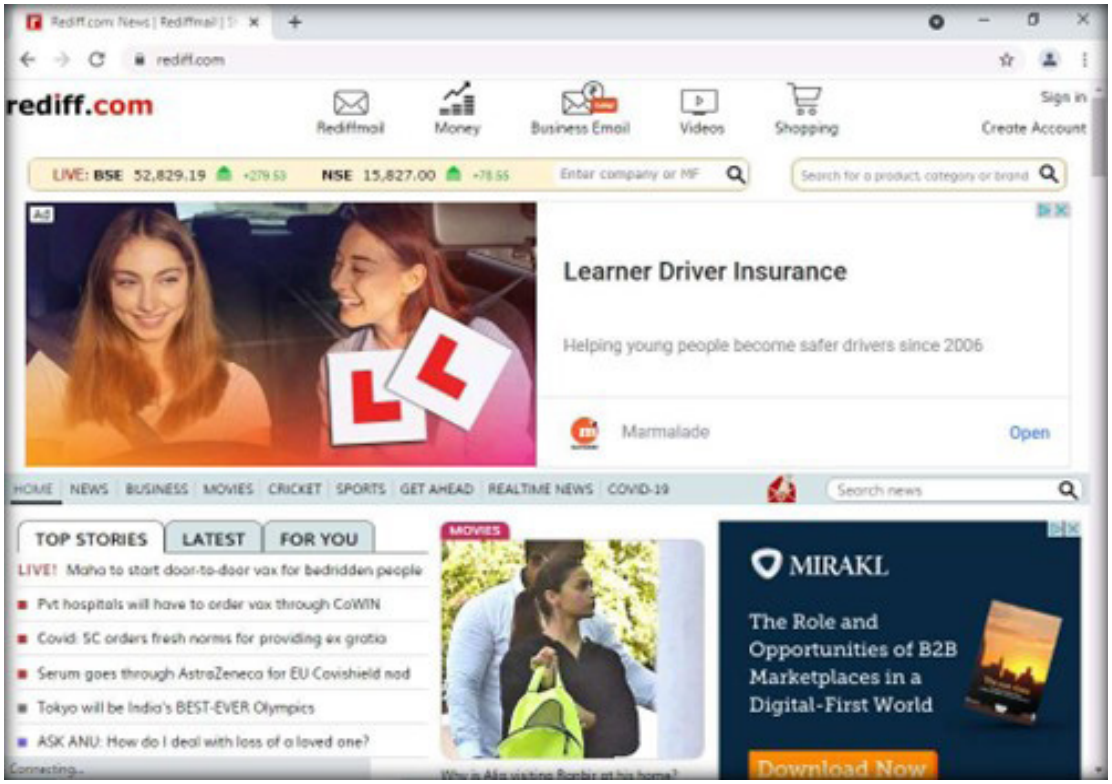
EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL

1. Turn on the **AD Domain Controller** virtual machine.

2. Login with the credentials **CCT\Administrator** and **admin@123**.
   Note: If the network screen appears, click **Yes**.

3. Switch to the **Admin Machine-1** virtual machine.

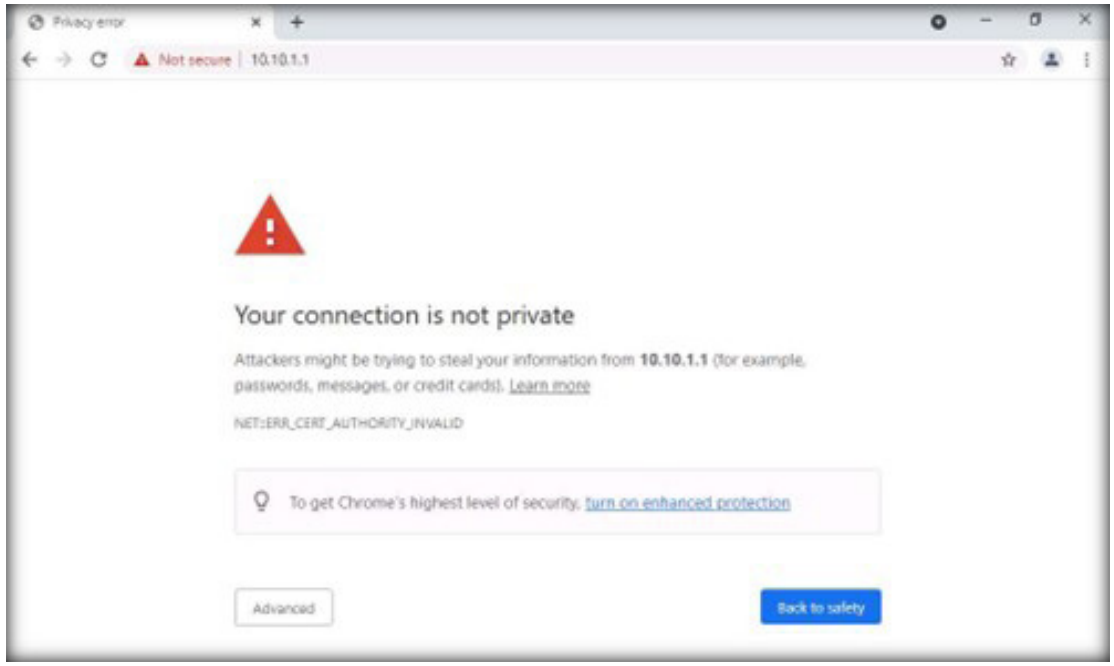
4. Open the **Google Chrome** browser, and type **www.rediff.com** and press **Enter**, the rediff.com website opens.



5. Close the browser. This infers that the www.rediff.com website is accessible to users. You can block access to this website using the pfsense firewall as follows.

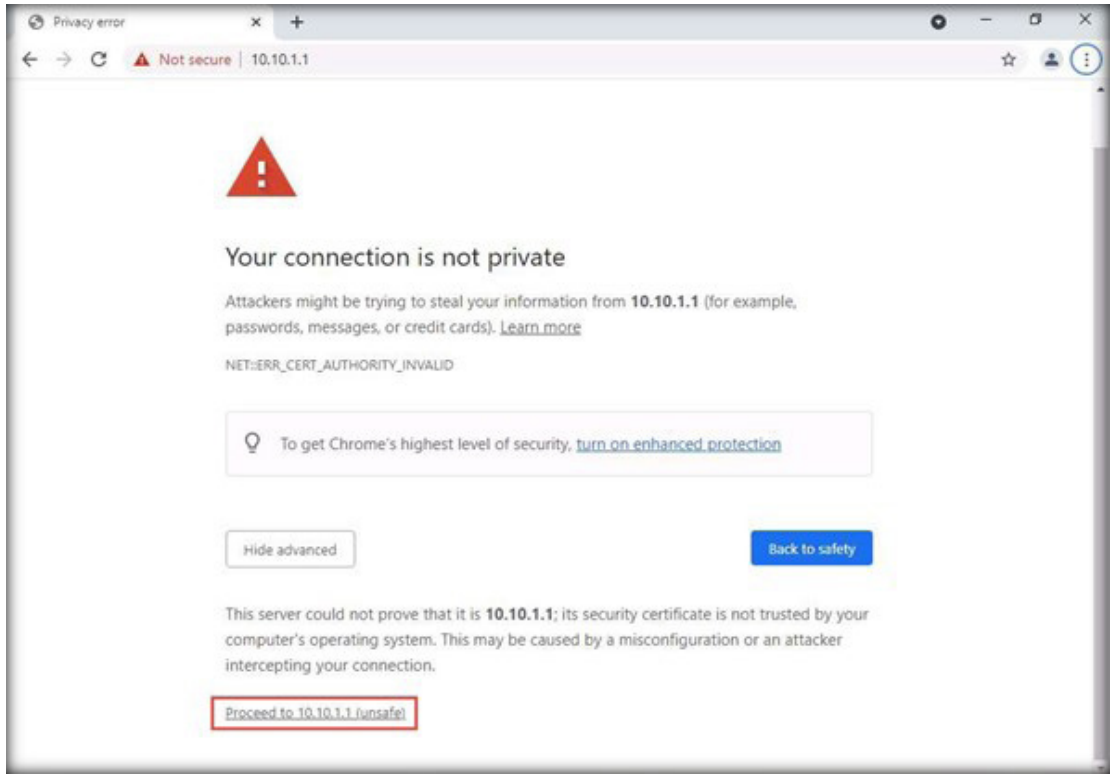
6. Open the **Google Chrome** browser, and type **https://10.10.1.1** and press **Enter** to access the web interface of pfSense.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



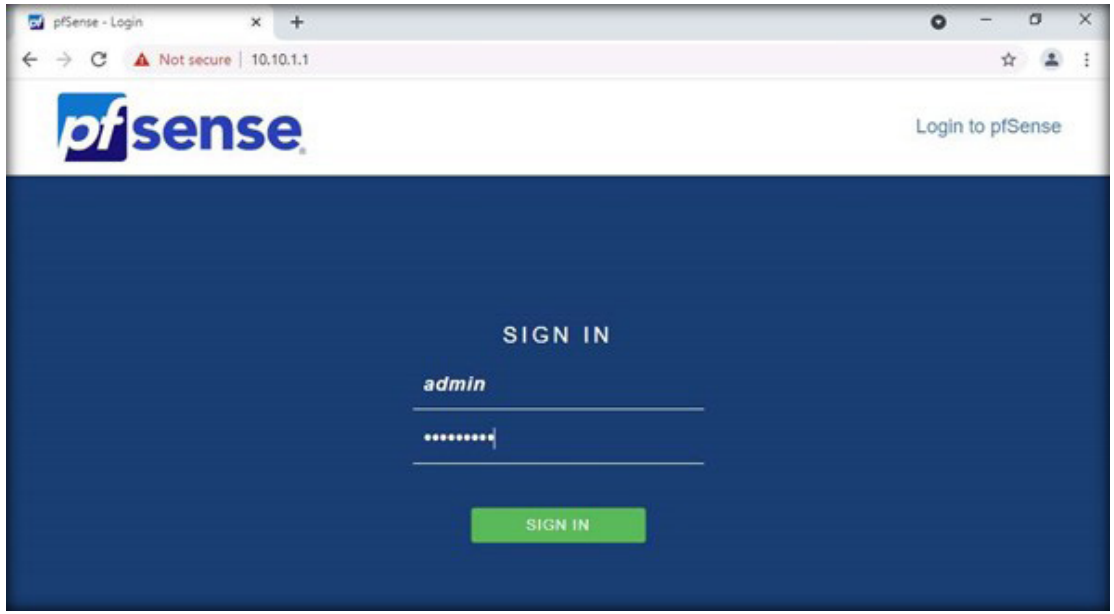
7. The privacy error shows. Click **Advanced** button and click on **Proceed to 10.10.1.1 (unsafe)** link.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



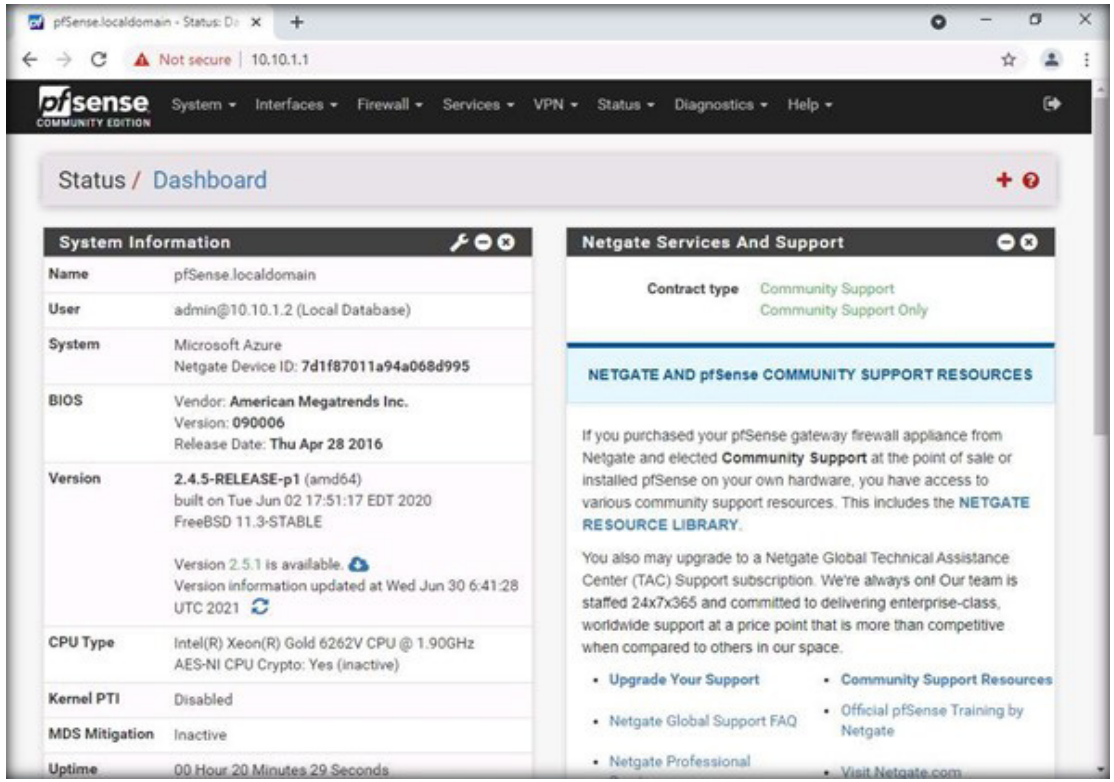
8. The login page appears, use the Username as **admin** and Password as **admin@123**. Click **SIGN IN**.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



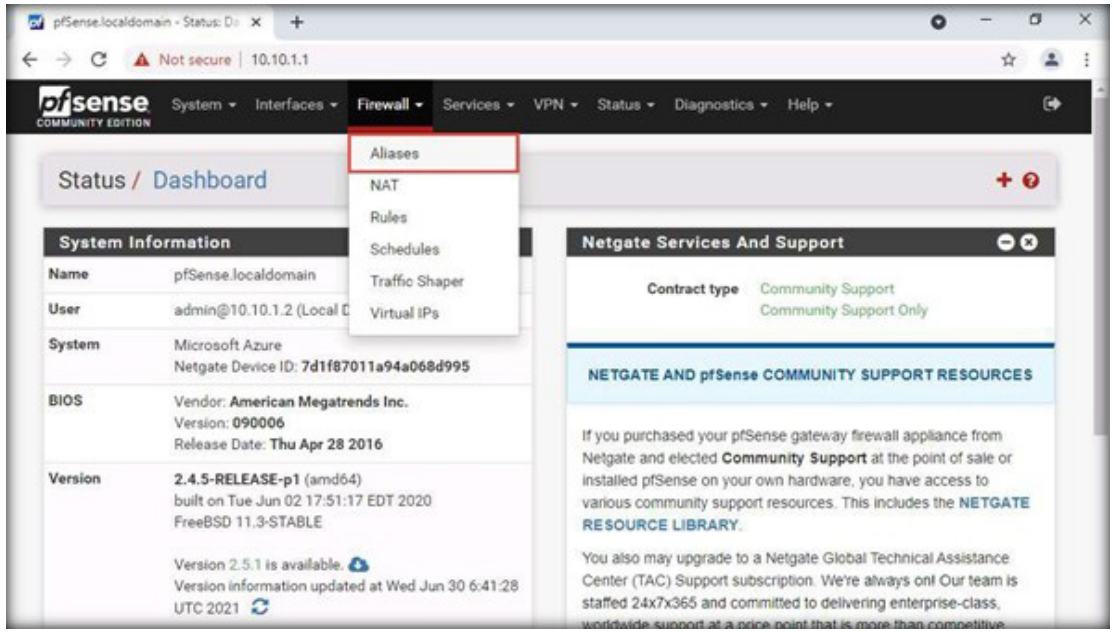
9. The pfSense home page will appear, as shown in the screenshot below.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



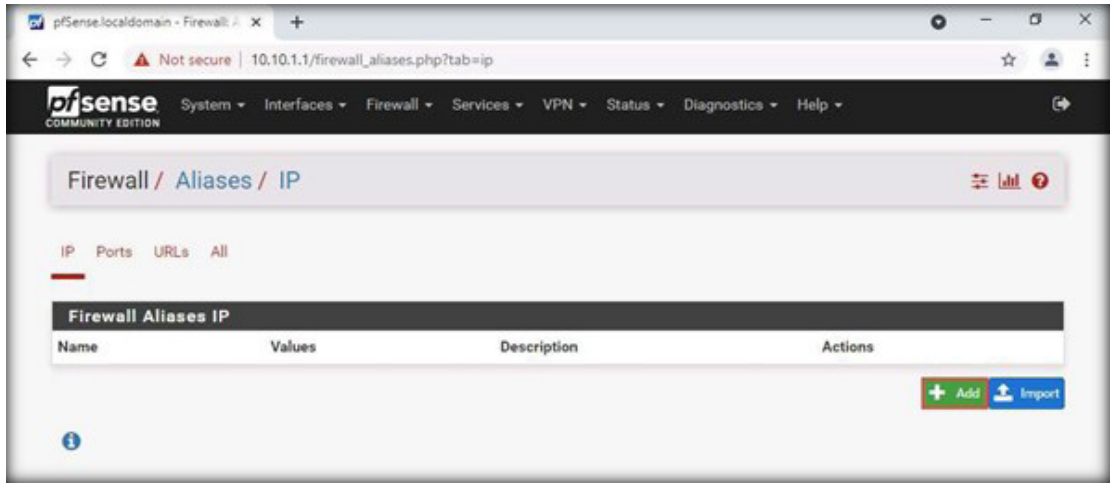
10. Navigate to the **Firewall > Aliases** option menu from the main menu to add the list of websites for restricting access.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



11. The **Firewall/ Aliases/ IP** page will appear. Click on the **Add** button.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



12. Next, we will check the domain IP address of (www.rediff.com) website to block. Minimize the browser.

13. To check the domain address of rediff.com, we need to ping the domain. To open the command prompt, type **cmd** in the windows search option and click **Command Prompt** app.

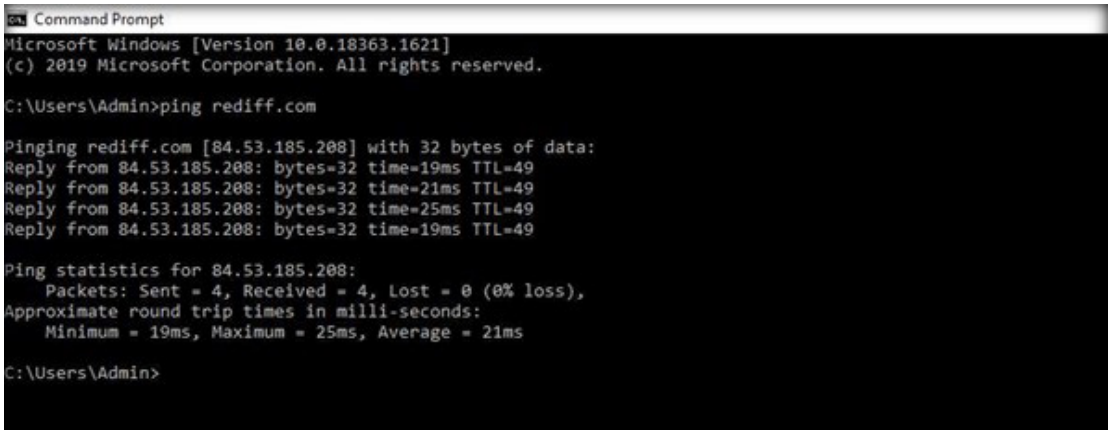
14. The **Command Prompt** will appear. To ping the domain name, type the command **ping rediff.com**, and press **Enter** as shown in the below screenshot.

15. The result of ping **rediff.com** shows the IP address of the **rediff.com** server. Note down the **IP address** to include it in the aliases list of pfSense firewall.

Note: Ensure that you have added all IP addresses related to **rediff.com**. As, sometimes, one domain name might have multiple IP addresses and these IP addresses are changed timely. Similarly, you can also add other unwanted hosts also within the alias.

Note: IP address may differ from the one shown in the above screenshot. Ensure that you have noted all IP addresses related to **rediff.com**. As, sometimes, one domain name might have multiple IP addresses.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



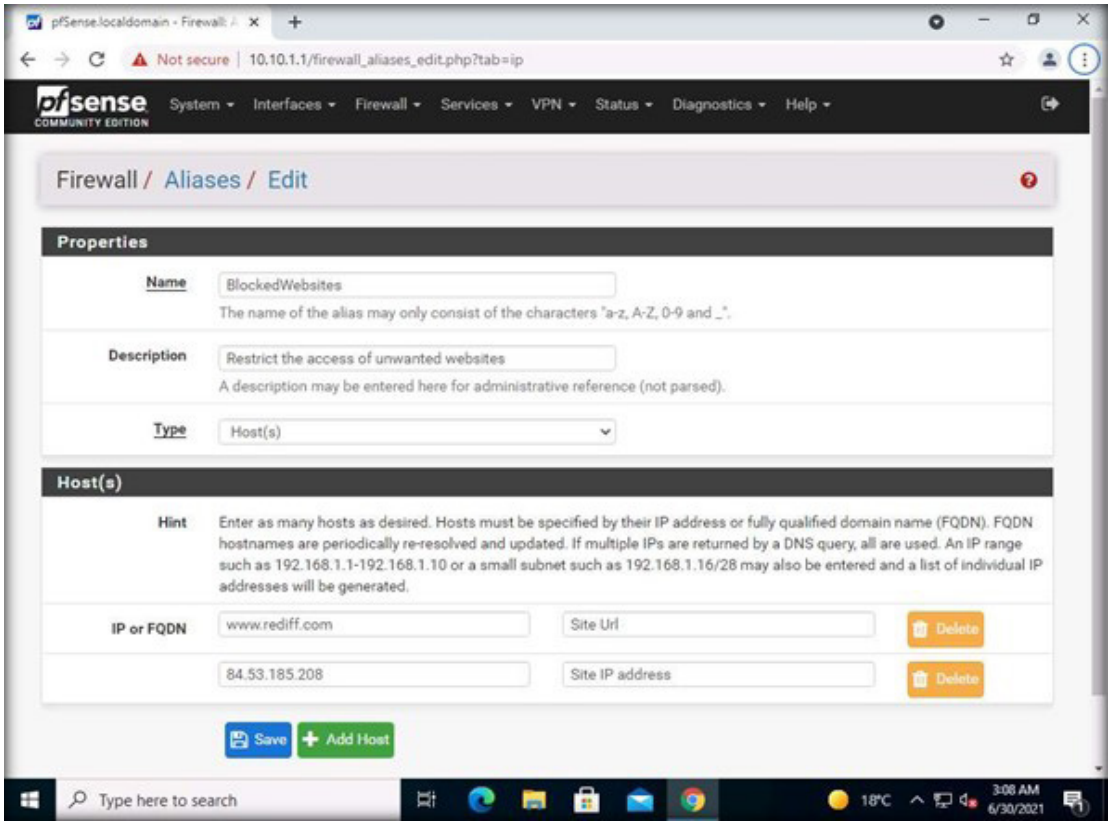
16. Next, switch to the **Google Chrome** web browser and add the following details. Under the Properties section, enter the following in the respective fields as shown in the following screenshot.

- **Name**: BlockedWebsites
- **Description**: Restrict the access of unwanted websites
- **Type**: Host(s)

  Under the Host(s) section, add domain url and IP addresses for the aliases list:
- **IP or FQDN**: www.rediff.com
- **Description**: Site Url

  Click **Add Host** button and add following IP address and description.
- **IP or FQDN**: 84.53.185.208 (Viewed rediff.com IP address from Command Prompt)
- **Description**: Site IP address

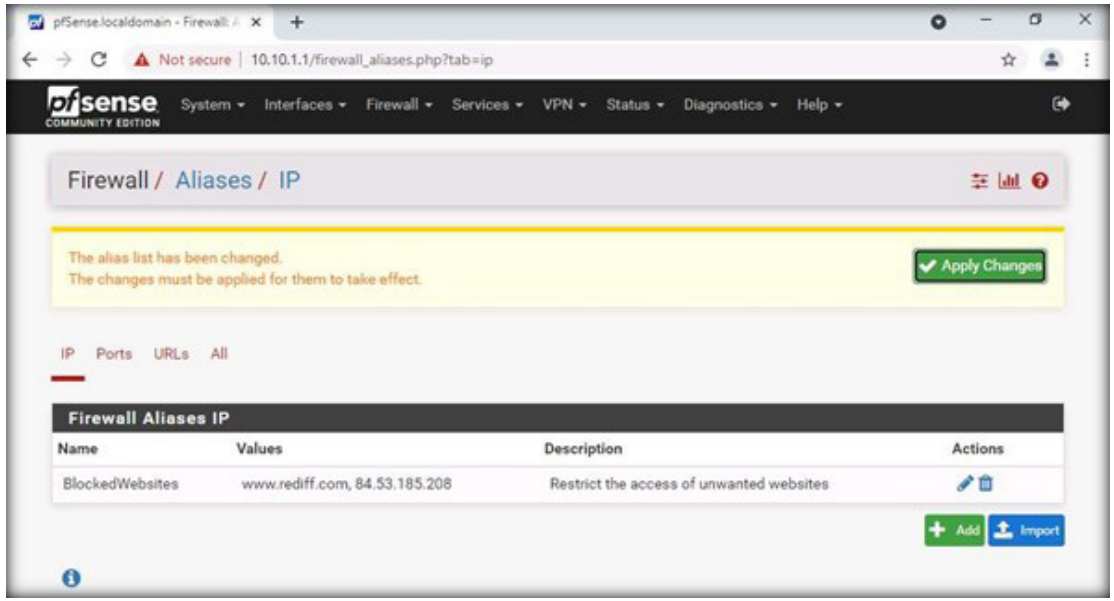
EXERCISE 3: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



17. Click **Save**.

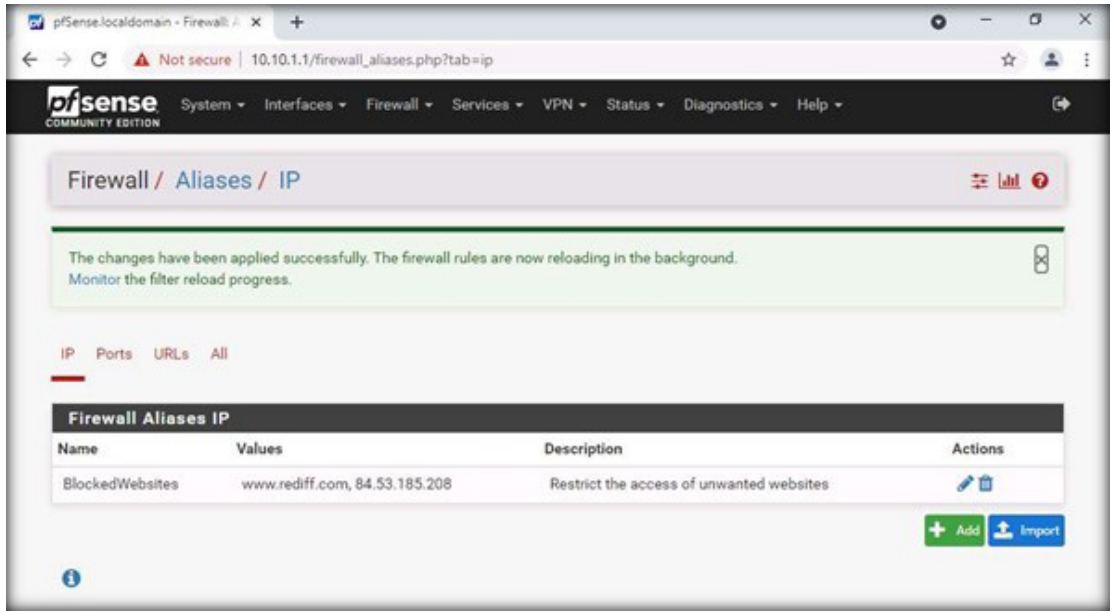
18. Click on **Apply Changes** button.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



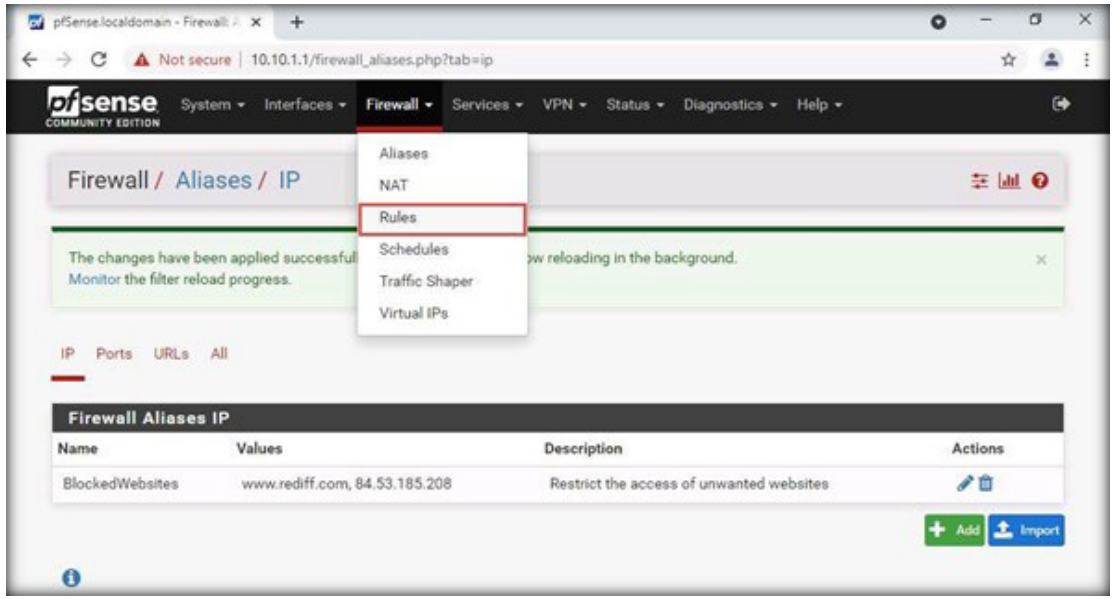
19. You will see the following message:
    The changes have been applied successfully. The firewall rules are now reloading in the background. Monitor the filter reload process.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



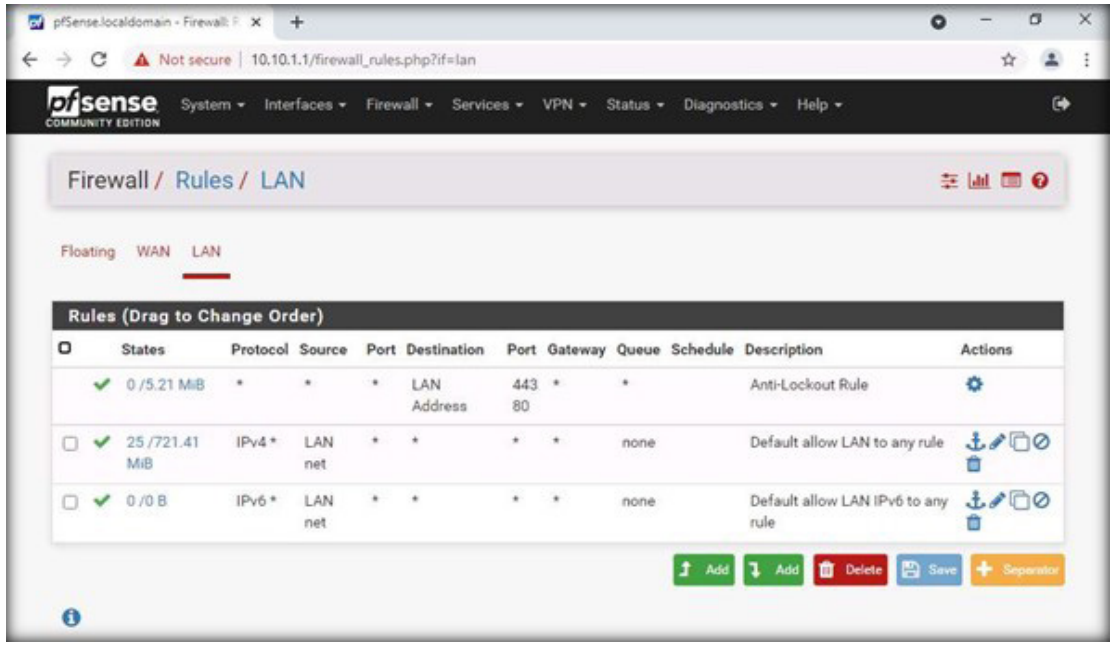
20. Next, we will add a firewall rule in pfSense to block the websites listed in the aliases. To add the rule, click on **Firewall > Rules** from the main menu in the pfSense web interface as shown in the screenshot below.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



21. The Rules page will appear. Select the **LAN** option to see the default rules list as shown in the screenshot below.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



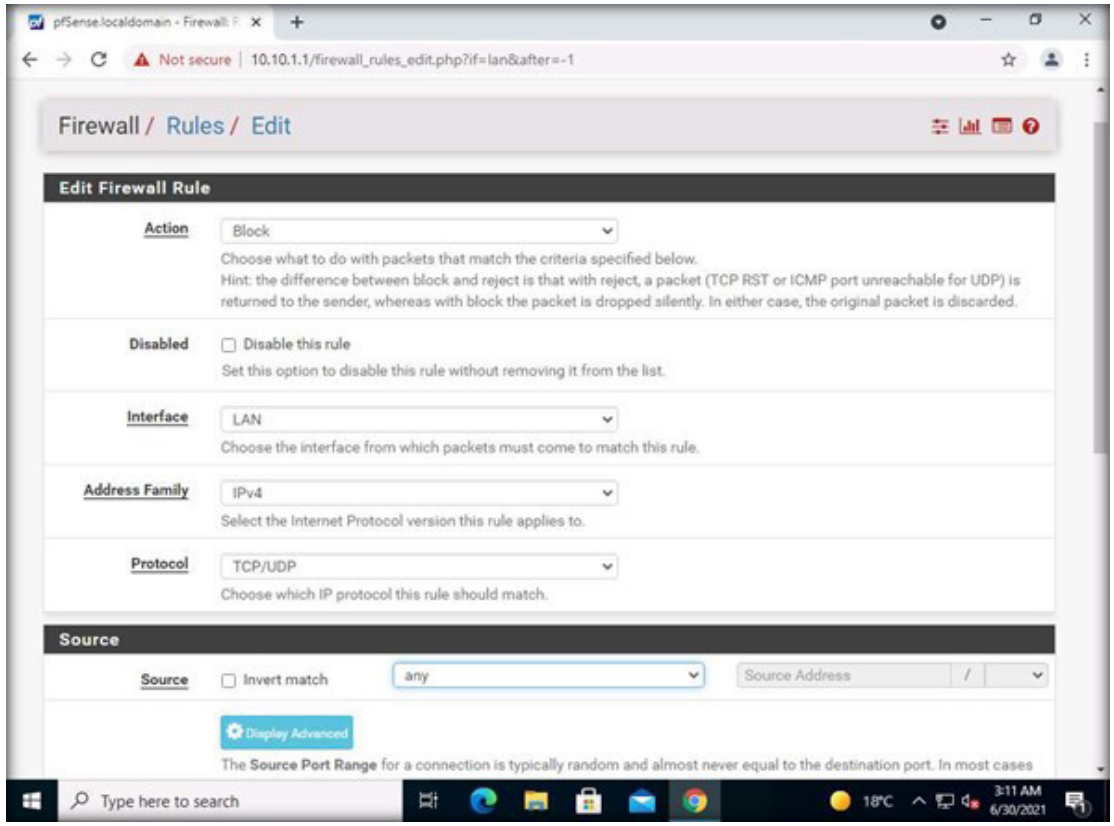
22. Click upper arrow **Add** to set a new rule on top of the default rule.

23. Under **Edit Firewall Rule** section, set below details.

- **Action**: Block
- **Interface**: LAN
- **Address Family**: IPv4
- **Protocol**: TCP/UDP

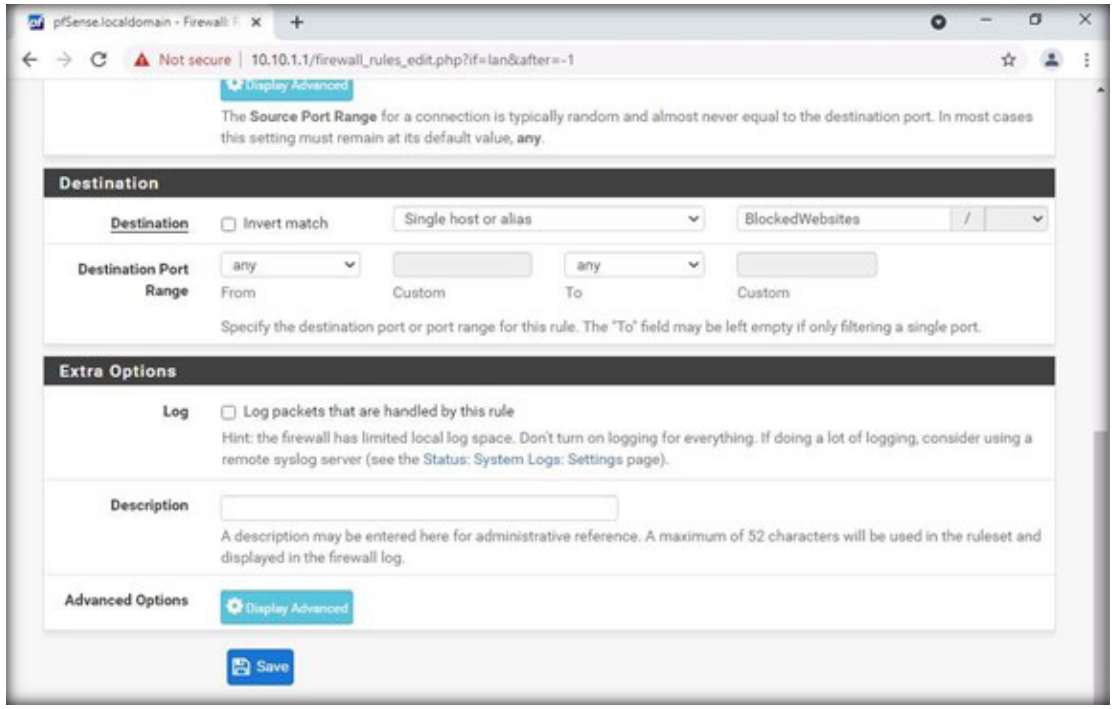
Under **Source** section, select **any** from the dropdown.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



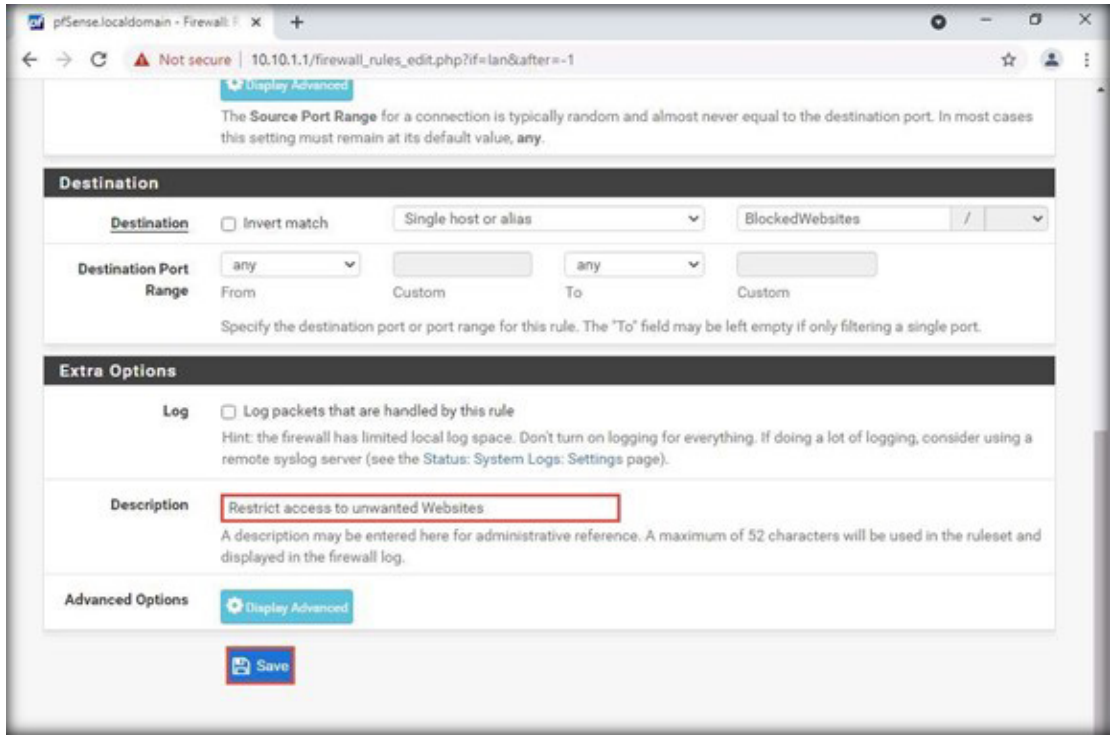
EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL

24. Under **Destination**, select **Single host or alias** from the dropdown and type **BlockedWebsites** in the text box, select **Destination Port Range** as **any**.



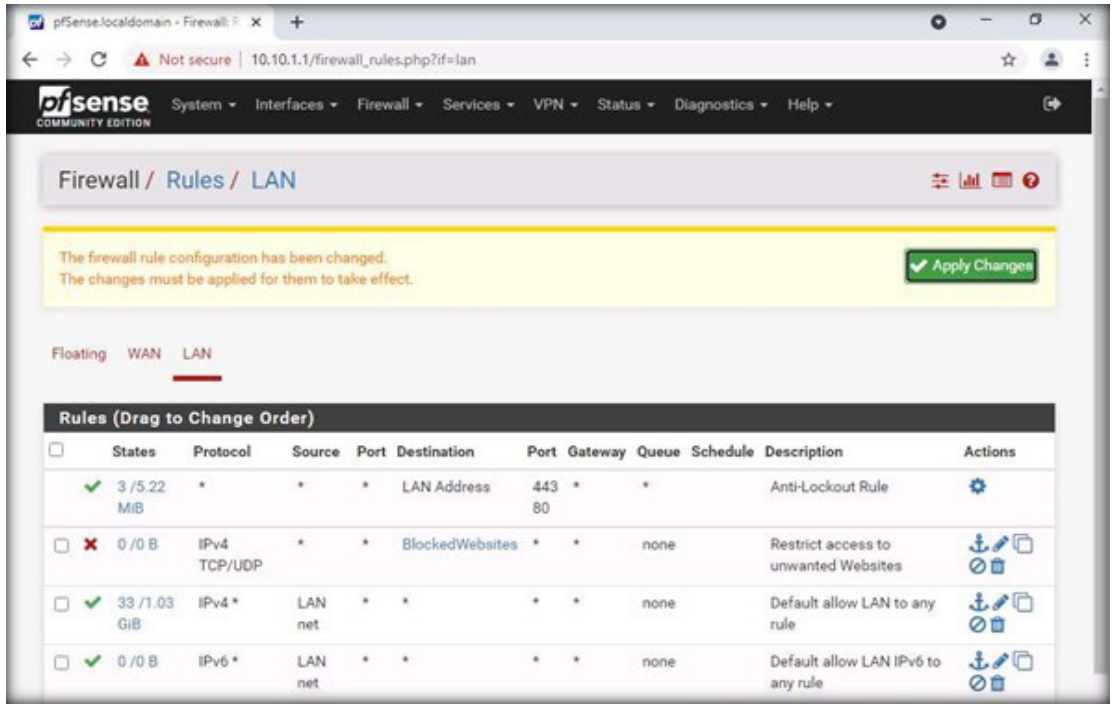
EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL

25. Scroll down, enter the text **Restrict access to unwanted Websites** in the **Description** field, and click **Save**.



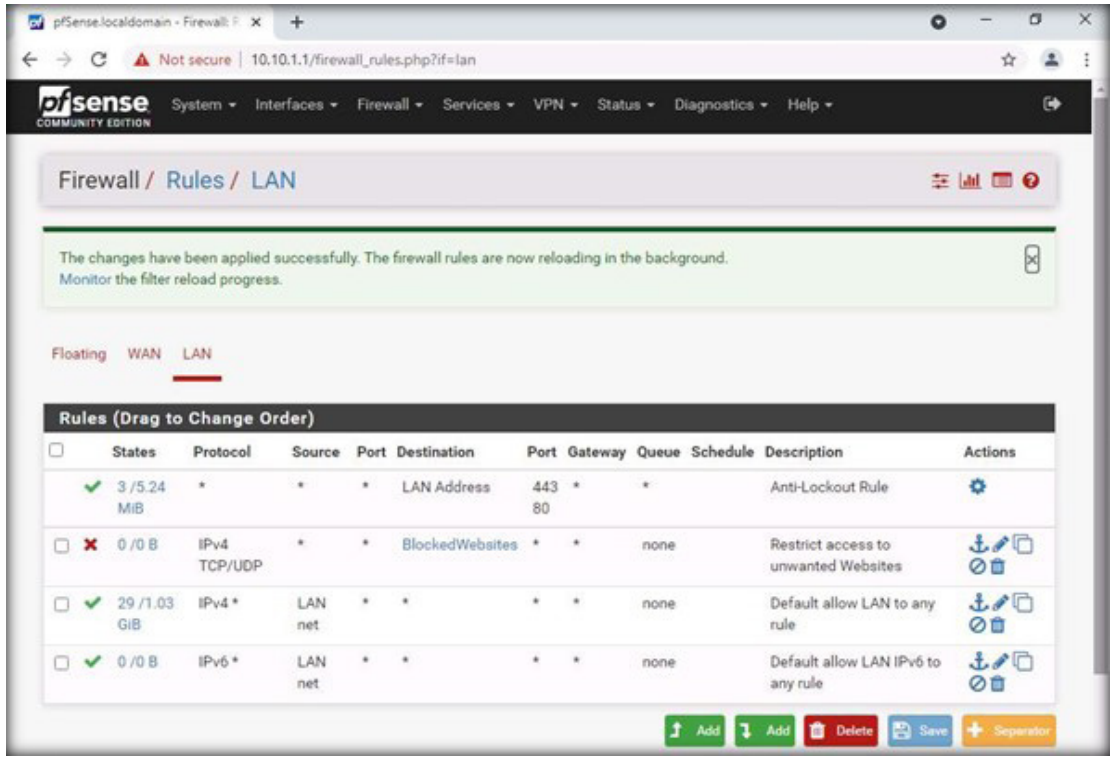
26. The page will redirect to the **Firewall/ Rules** page. Click **Apply Changes**.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



27. The firewall rule has been successfully created as shown in the screenshot below.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



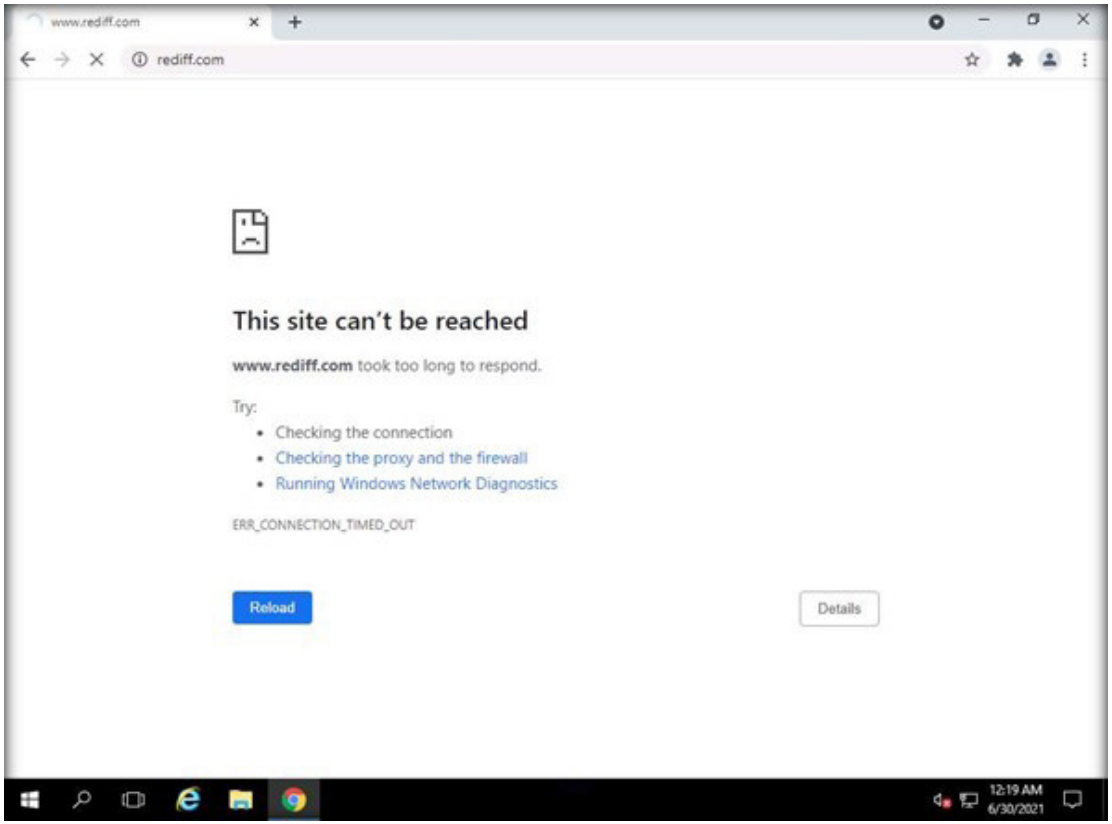
28. Close all open windows.

29. Switch to the **Web Server** virtual machine.
    Note: If you are already logged into the **Web Server** virtual machine, then skip to **Step#31**.

30. Log in with the credentials **Administrator** and **admin@123**.

31. Open the browser and type **www.rediff.com** to check if rediff is accessible. You will see the following message: **This site can't be reached**.

EXERCISE 3:
IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK UNWANTED WEBSITE ACCESS USING PFSENSE FIREWALL



32. This indicates that the firewall is blocking the website listed in the firewall rule.

33. Close all open windows.

34. Turn off the **AD Domain Controller** virtual machine.

EXERCISE 4: **IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL**

Firewall rules allow a computer to send or receive packets from a program, services, computers, and/or users.

LAB SCENARIO

To keep the computer resources of the organization secure, the security professional needs to configure outbound traffic because outbound traffic leaves the network vulnerable to malware that targets organizational resources. These threats can be protected by using firewall rules. The pfSense firewall allows specific traffic on specific ports while blocking all other traffic.

LAB OBJECTIVE

This lab will demonstrate how to block insecure ports using the pfSense firewall and protect endpoints within the network using the pfSense firewall.

OVERVIEW OF FIREWALL RULES

Firewall rules can be created for either inbound or outbound traffic.

- An inbound firewall rule protects the network against incoming malicious traffic from the Internet or other network segments.
- An outbound firewall protects against outgoing traffic originating inside an enterprise network.

Firewall rules can be configured to specify computers, users, programs, services, ports, and protocols.

LAB TASKS

Note: Ensure that **Admin Machine-1, Web Server** and **PfSense Firewall** virtual machines are running.

1. Turn on the **AD Domain Controller** virtual machine.

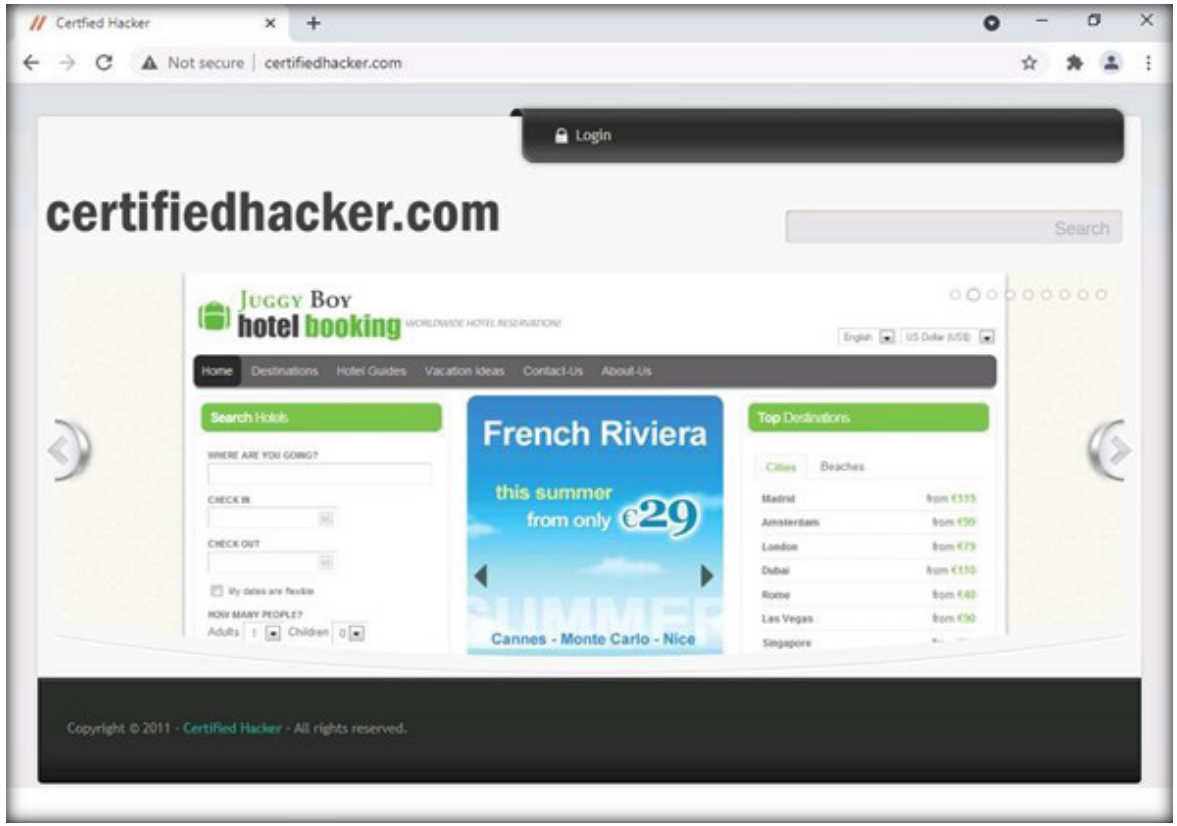
2. Log in with the credentials **CCT\Administrator** and **admin@123**.
   Note: If the network screen appears, click **Yes**.

3. Switch to the **Web Server** virtual machine.
   Note: If you are not logged into the machine, then log in using credentials **Administrator / admin@123**.

4. In **Web Server** virtual machine, to open the browser, double click the **Google Chrome** icon on the **Desktop**.

5. Type **http://certifiedhacker.com/** in the address bar, and press **Enter**. You will be able to access the web page, as shown in the below screenshot.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



6. Next, we shall create a rule to restrict a user from accessing **HTTP-enabled** websites (**by blocking port http 80**), so that they can access only https-enabled websites on the Internet.

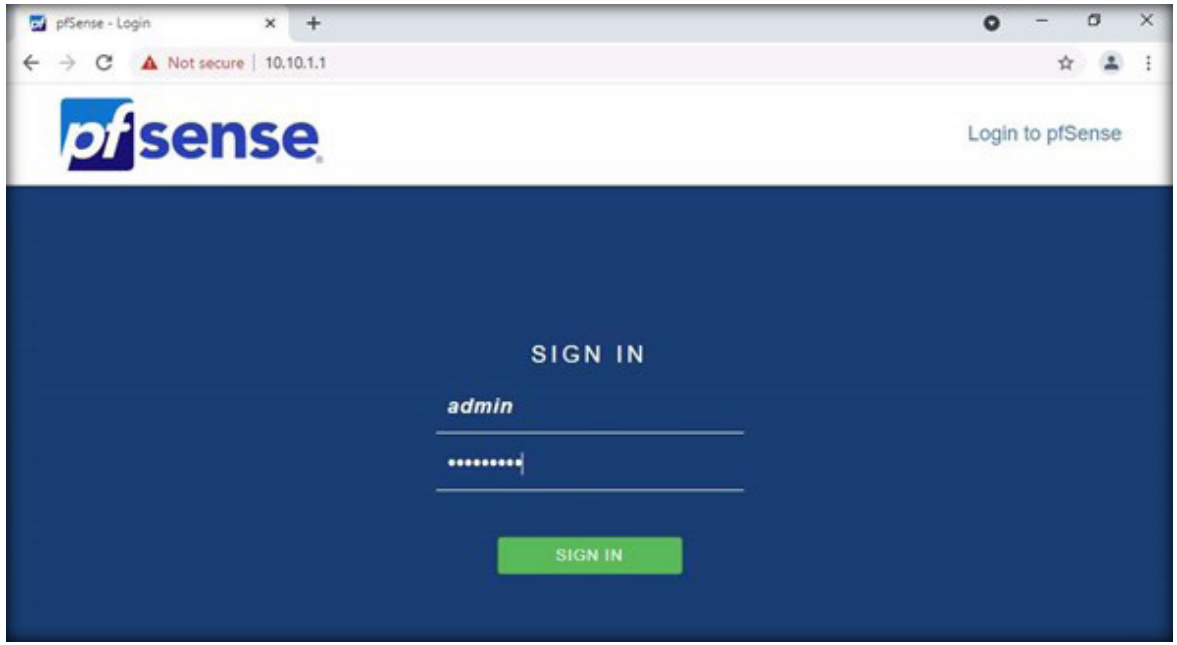
7. Switch to the **Admin Machine-1** virtual machine.

Note: If you are not logged into the machine, then log in with the credentials **Admin** and **admin@123**.

8. To open the browser, double click the **Google Chrome** icon on the **Desktop**.

9. Browse pfSense web interface. Type **https://10.10.1.1** in the address bar, and press **Enter**. Click **Advanced** button and click proceed to **10.10.1.1 (unsafe)** link.

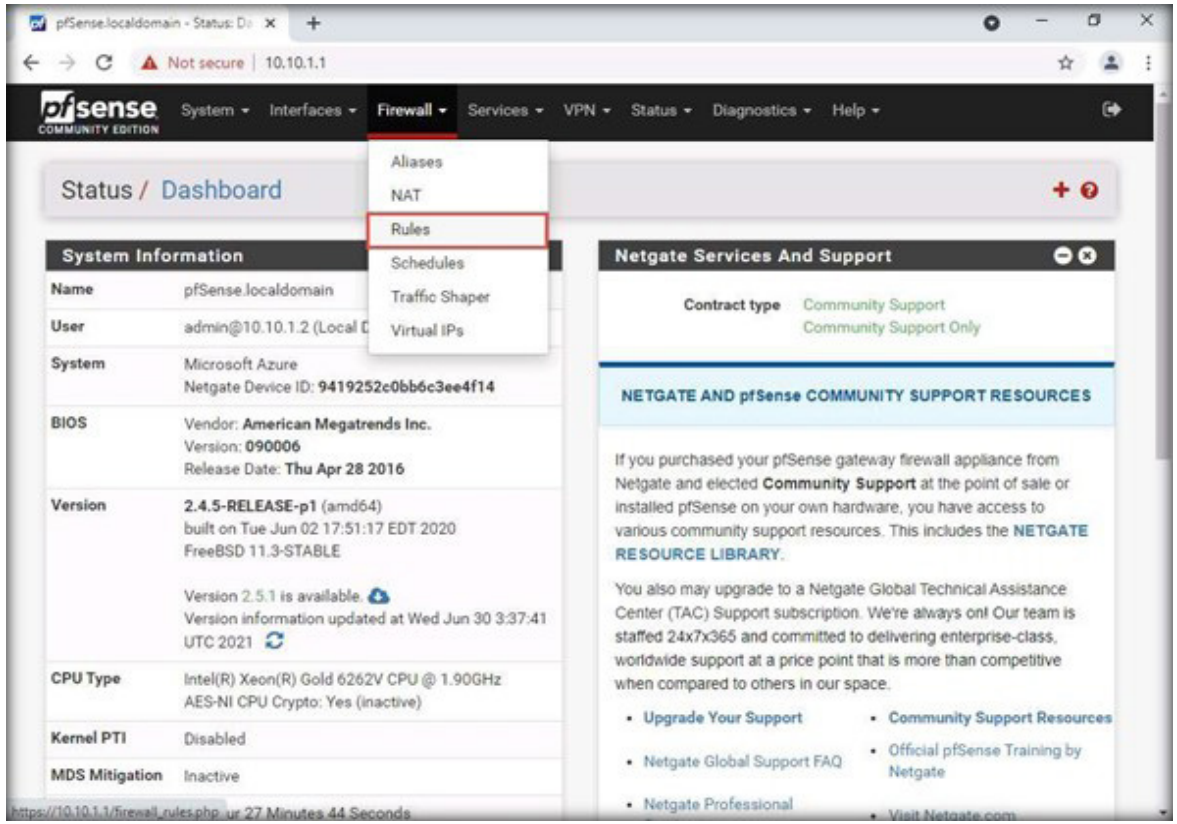
10. The pfSense login page will appear. Type the username as **admin** and password as **admin@123**, and click the **SIGN IN** button, as shown in the screenshot below.



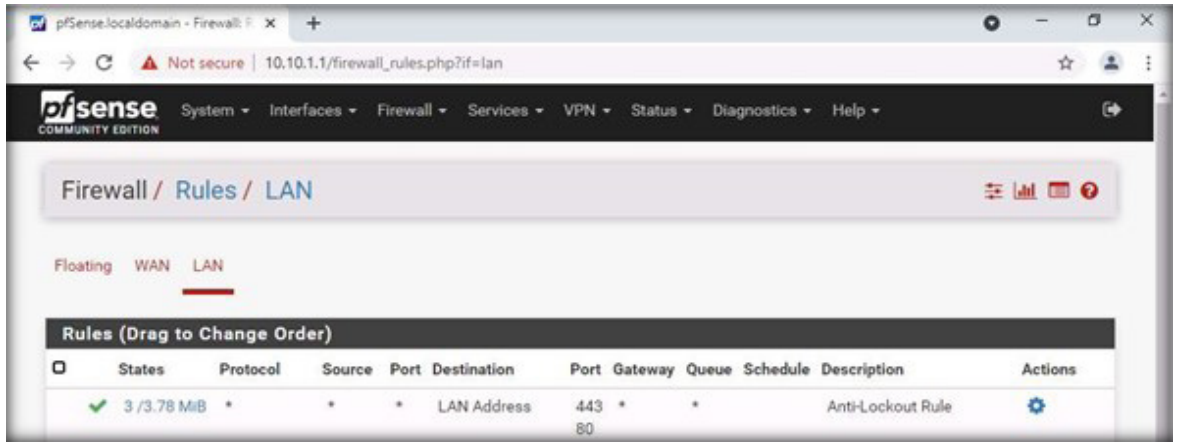
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

11. The **pfSense Dashboard** will appear. Navigate to **Firewall > Rules** from the main menu.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



12. The **Firewall/Rules/WAN** page will appear. Click the **LAN** option.



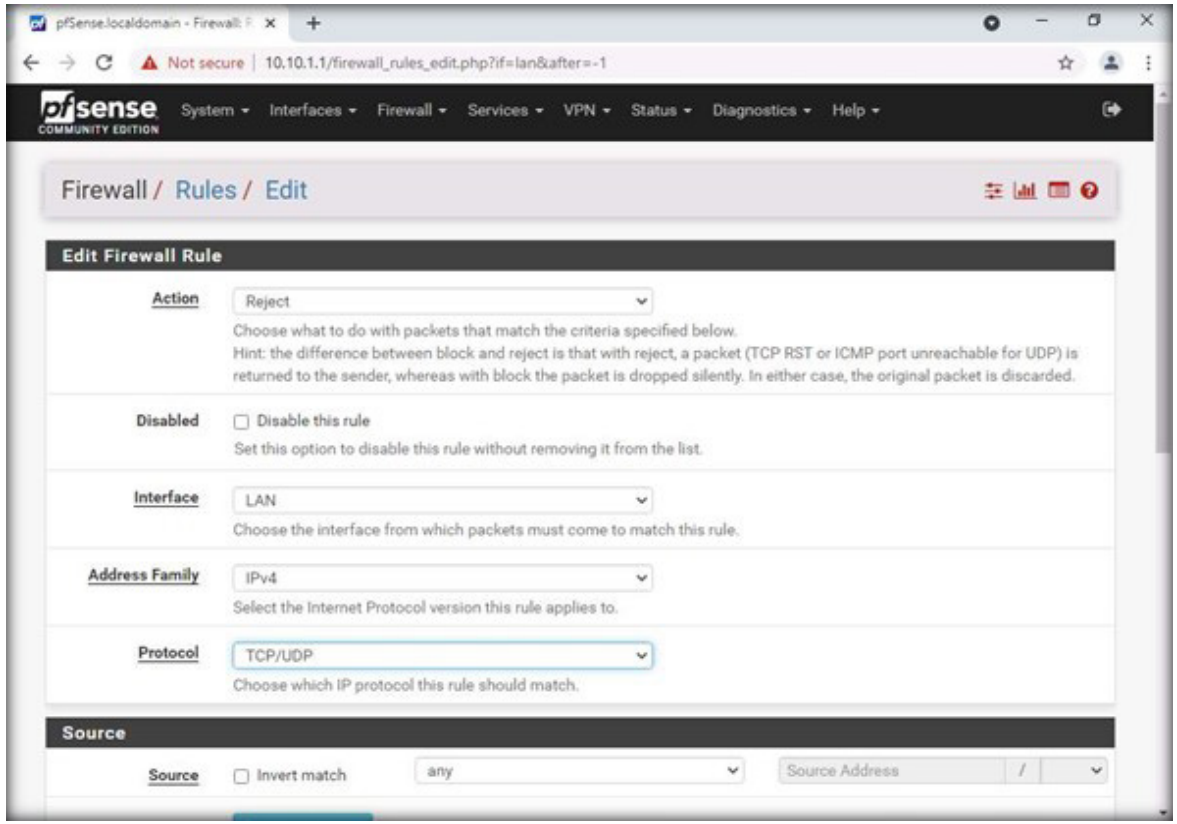
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

13. To create a rule, click the up arrow Add button.

14. Set the following details under Edit Firewall Rule section:

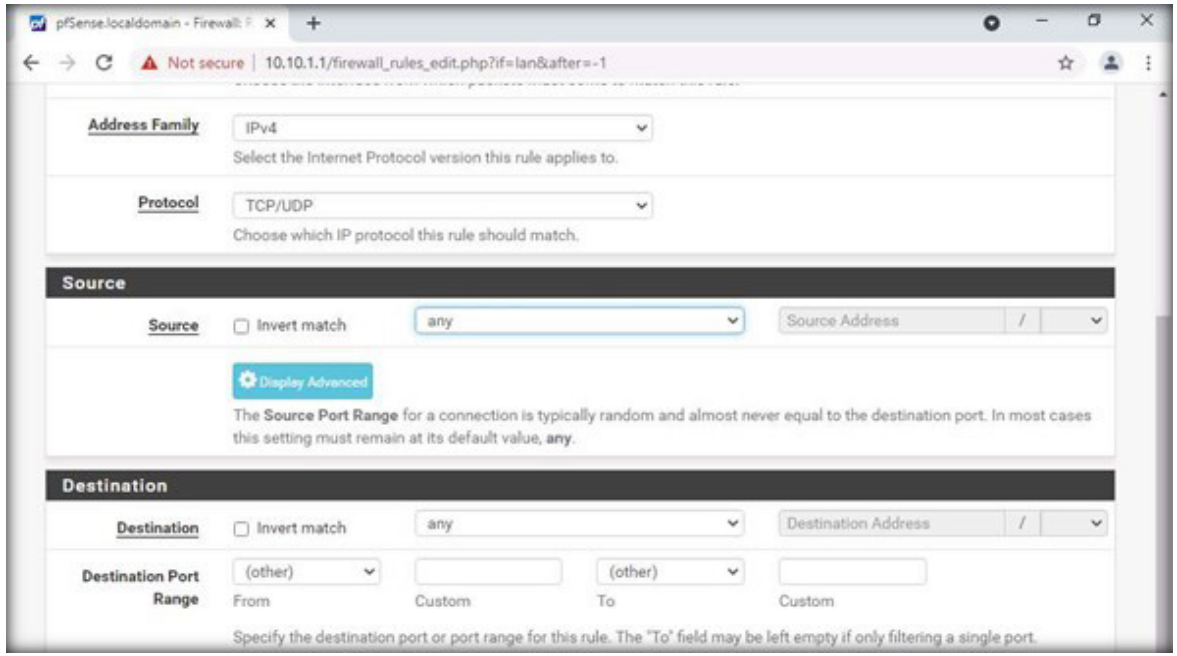
- Action > Reject
- Interface > LAN
- Address Family > IPv4
- Protocol > TCP/UDP.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



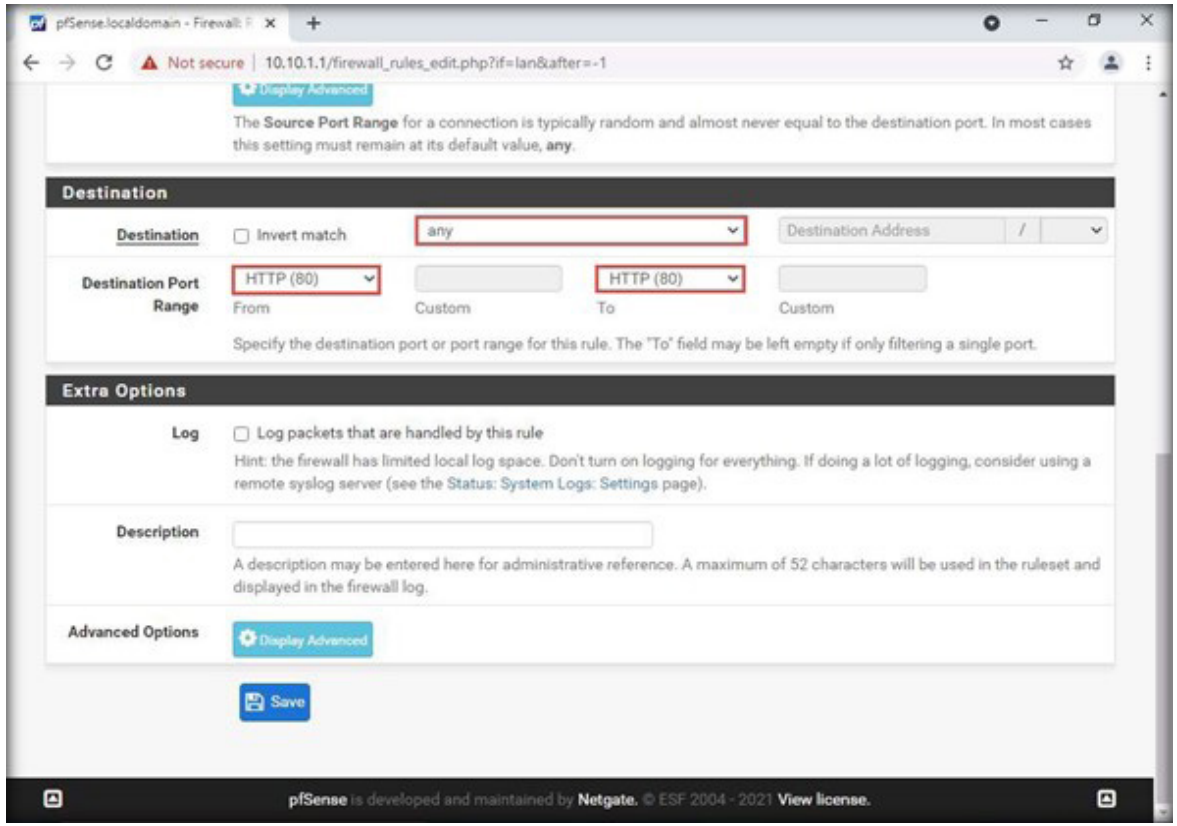
15. Under **Source** section, select **any** from the dropdown as shown in the below screenshot.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



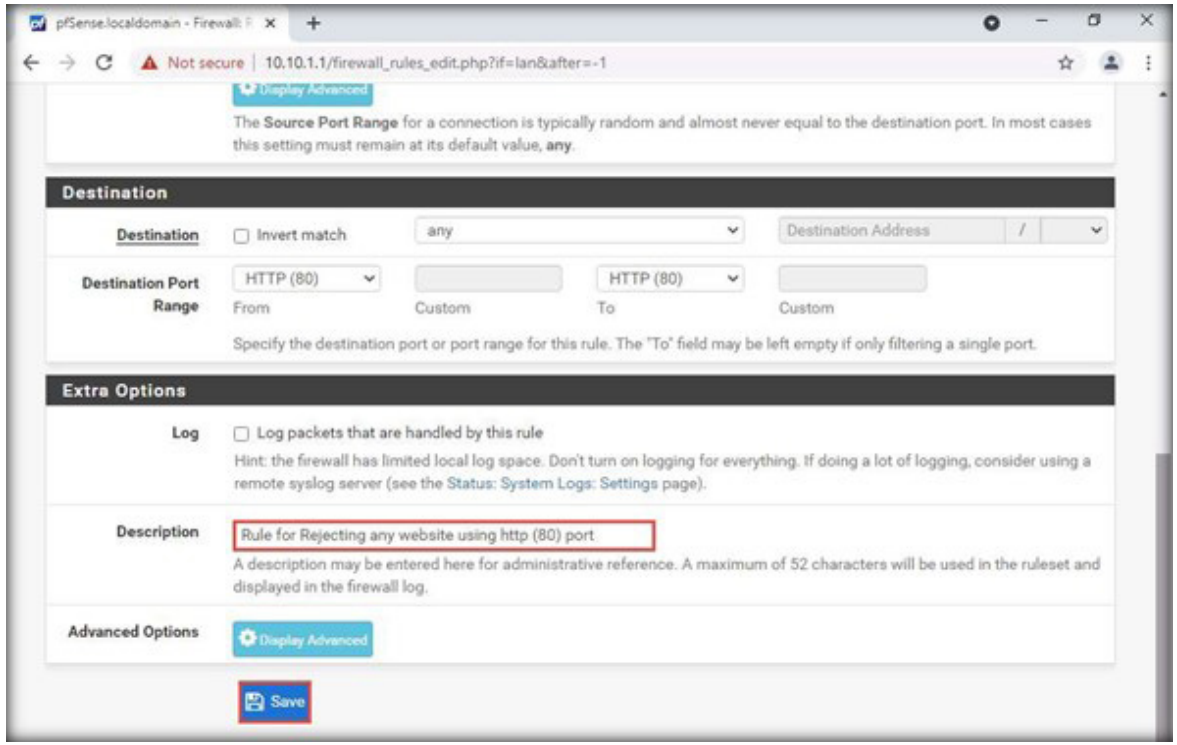
16. Under **Destination** section, select **any** from the dropdown and set **Destination Port Range to HTTP (80)** from the dropdown.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



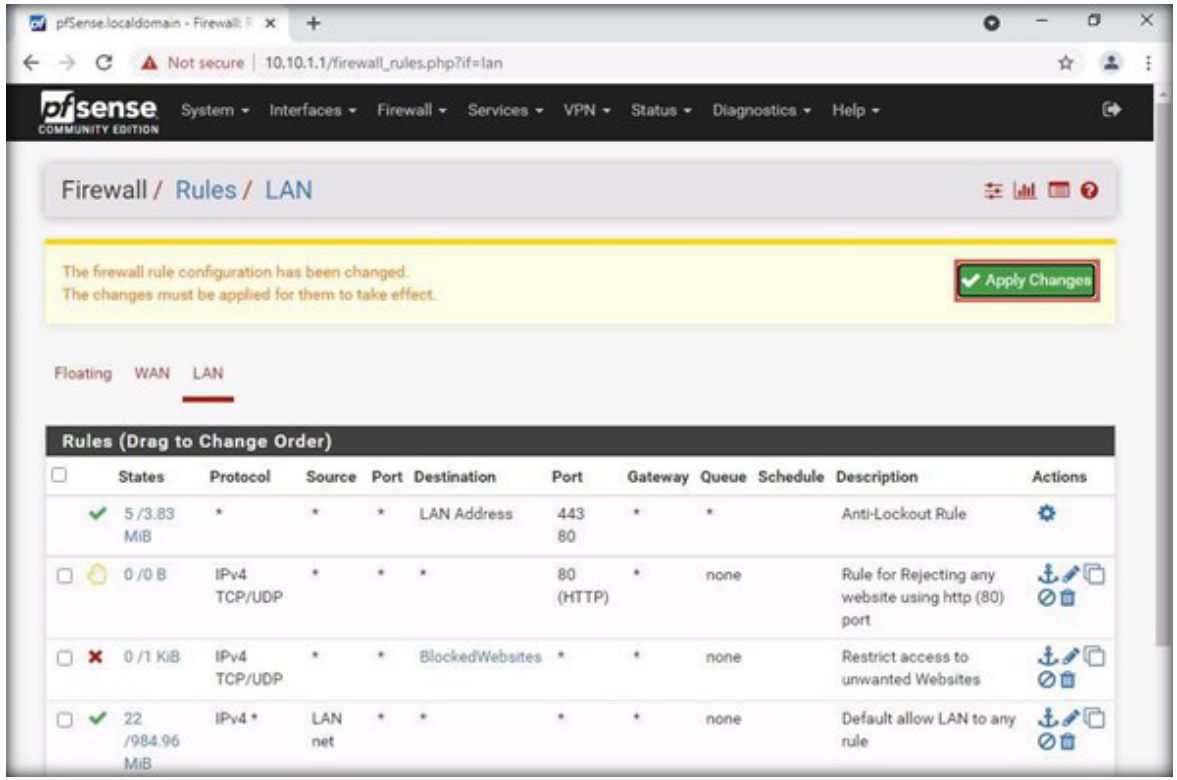
17. Scroll down. Under **Extra Options**, enter **Rule for Rejecting any website using http (80) port** in the **Description** field, and click **Save**.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



18. The page will redirect to the **Firewall/Rules/LAN** page. Click **Apply Changes**.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

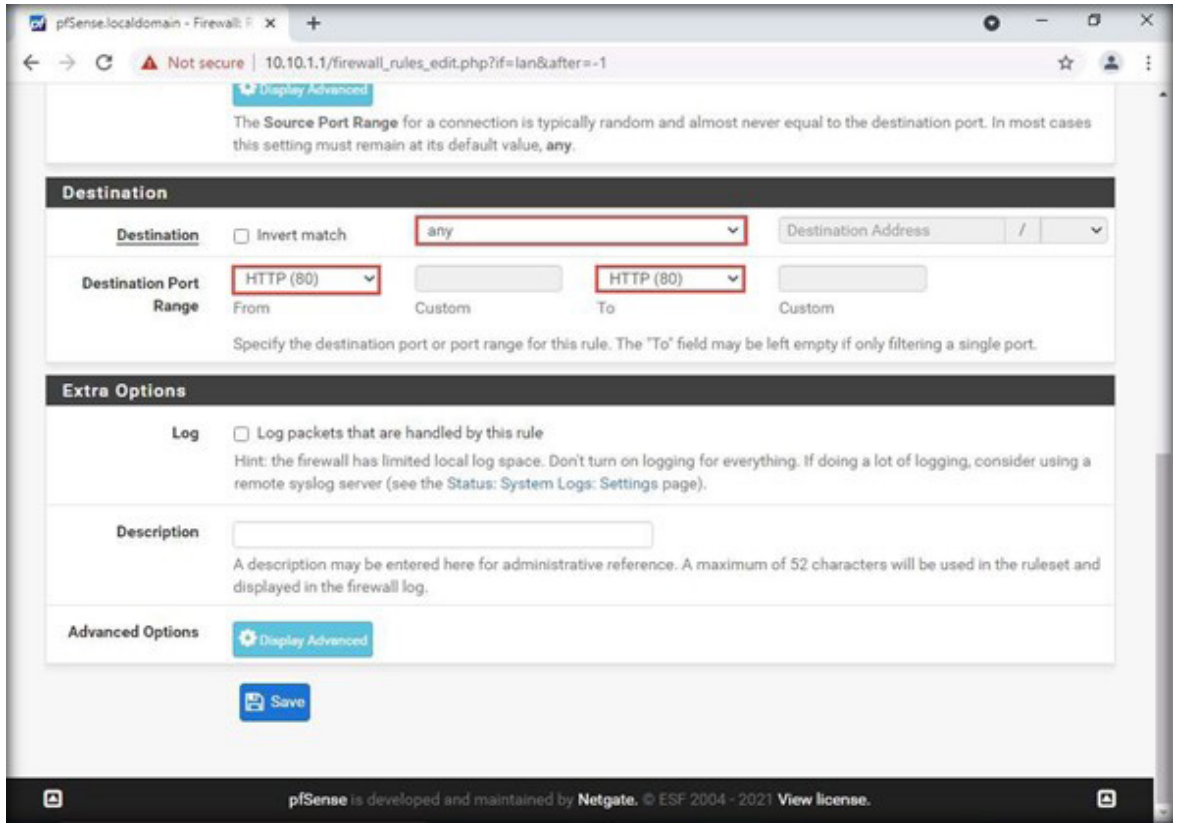


19. The firewall rule has been successfully created.

20. Close browser window.

21. Switch back to the **Web Server** virtual machine.

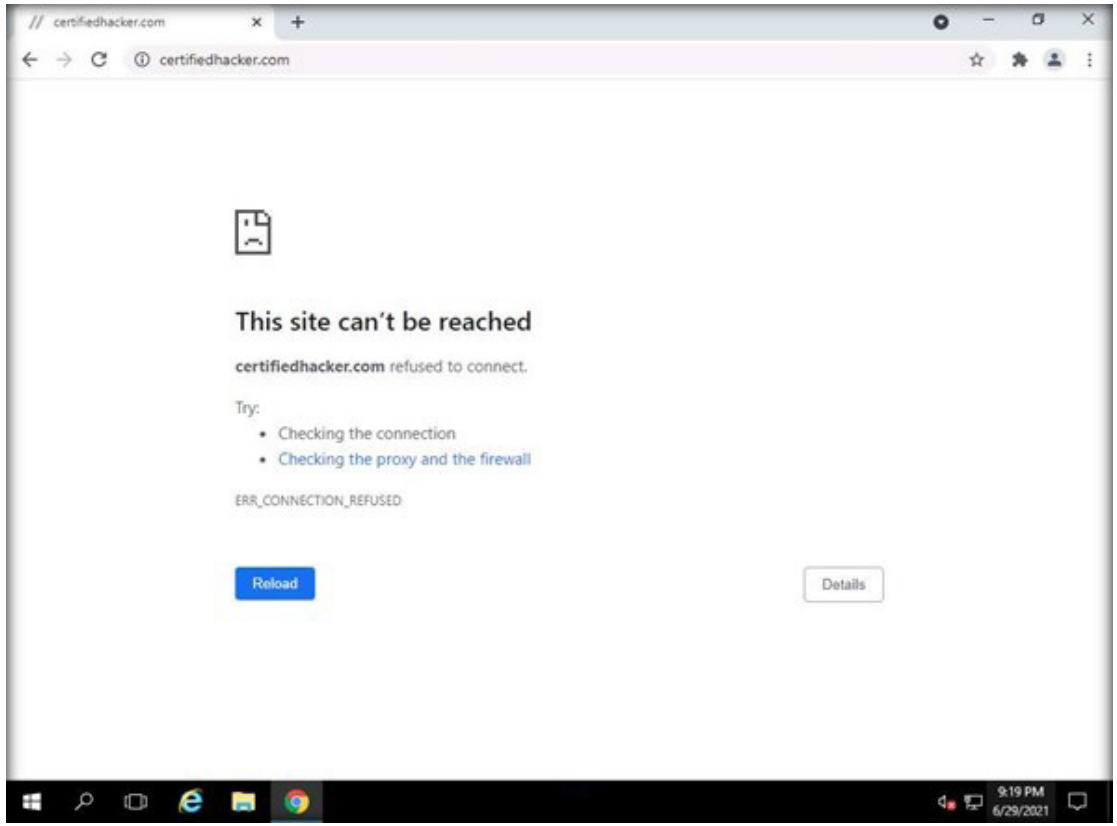
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



22. In the Chrome browser (it is already opened, or you can launch a new window), enter **http://certifiedhacker.com/** in the address bar, and press **Enter**. You will see the message as **This site can't be reached**. This is because the pfSense firewall rule is now preventing the traffic from the port http.

Note: If changes are not affecting, then reboot the pfSense firewall and clear the Chrome browser cache.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

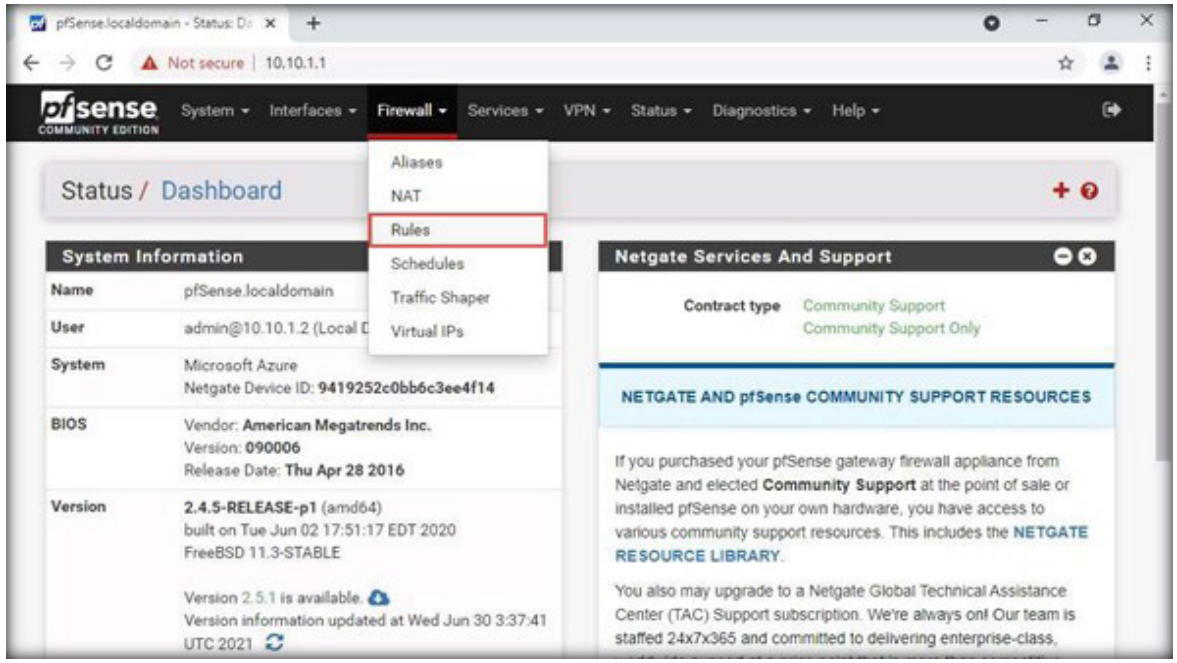


23. Close browser window.

24. Delete the firewall rules created in this exercise and previous exercise.

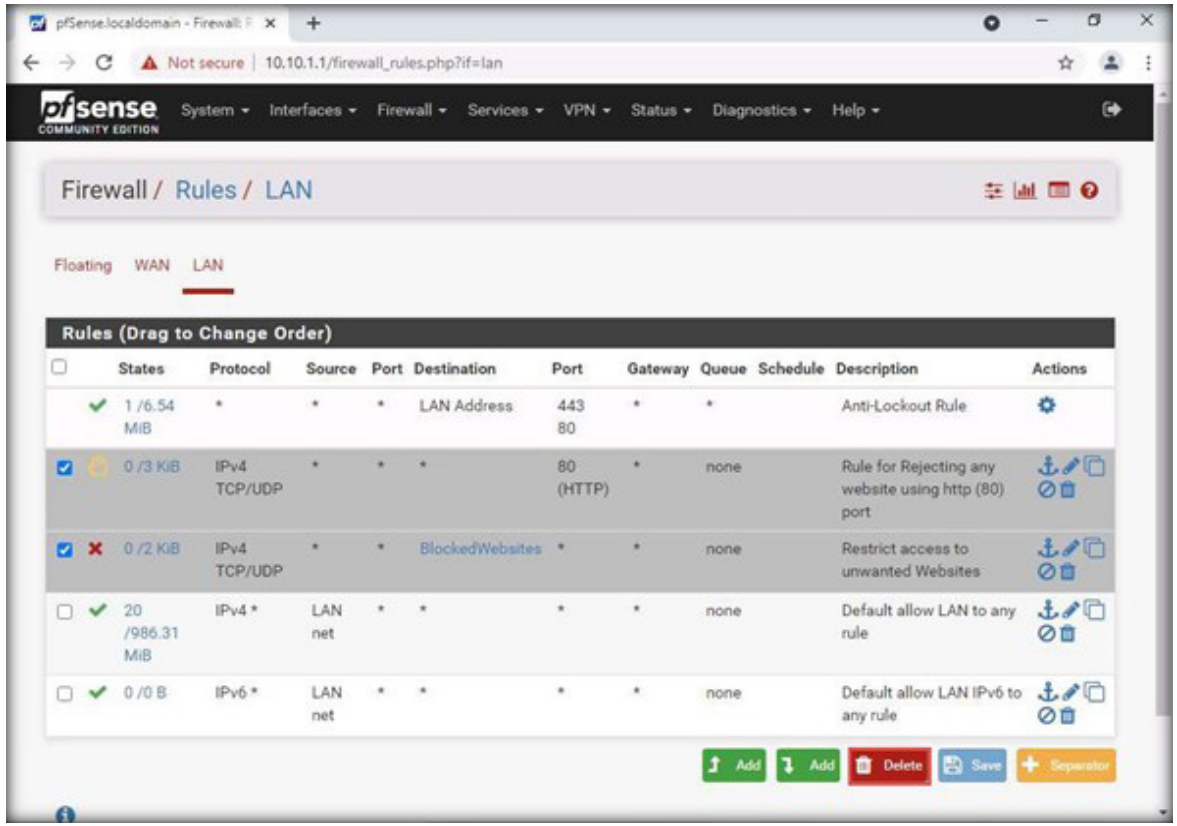
25. To delete the firewall rules, switch to **Admin Machine-1** virtual machine. Repeat steps **Step 9** to **Step 11**. Navigate to **Firewall > Rules** from the main menu.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



26. The Firewall/Rules/WAN page will appear. Click the **LAN** option. Select both the created rules by checking the checkboxes against the rules. and click **Delete** button.

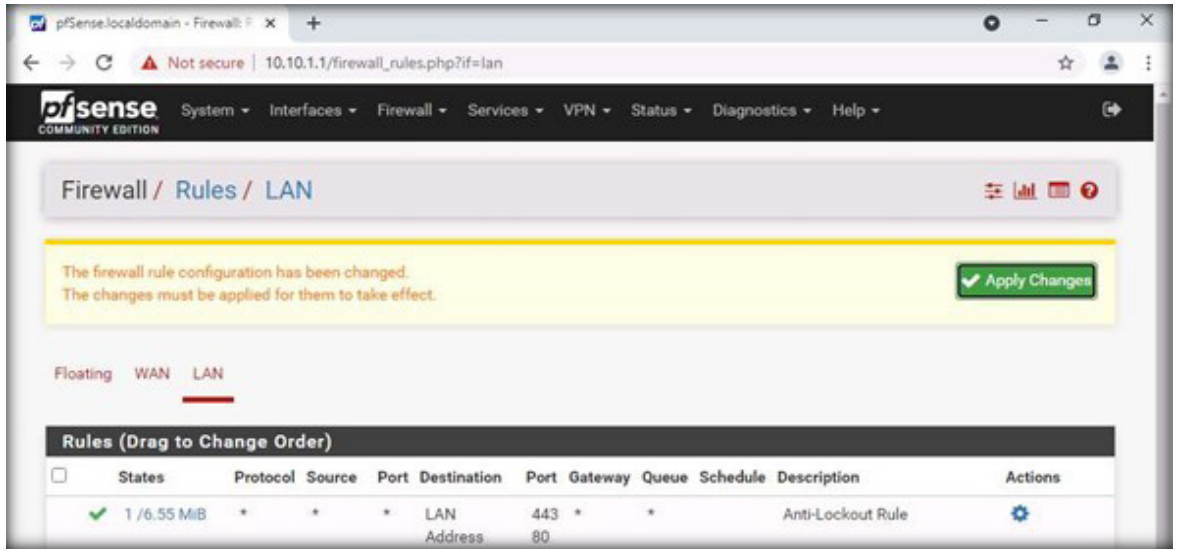
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



27. Click **OK** in the Rule deletion confirmation pop-up.

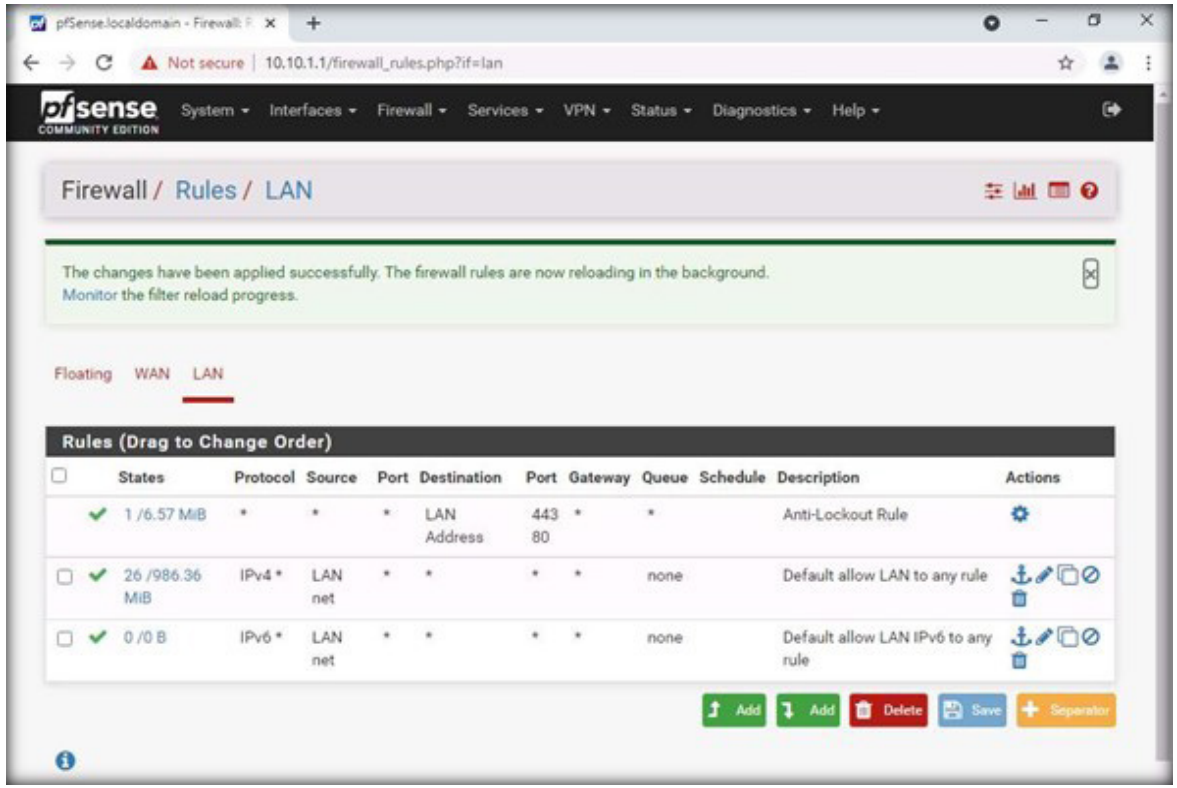
28. The page will redirect to the Firewall/Rules/LAN page. Click **Apply Changes**.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



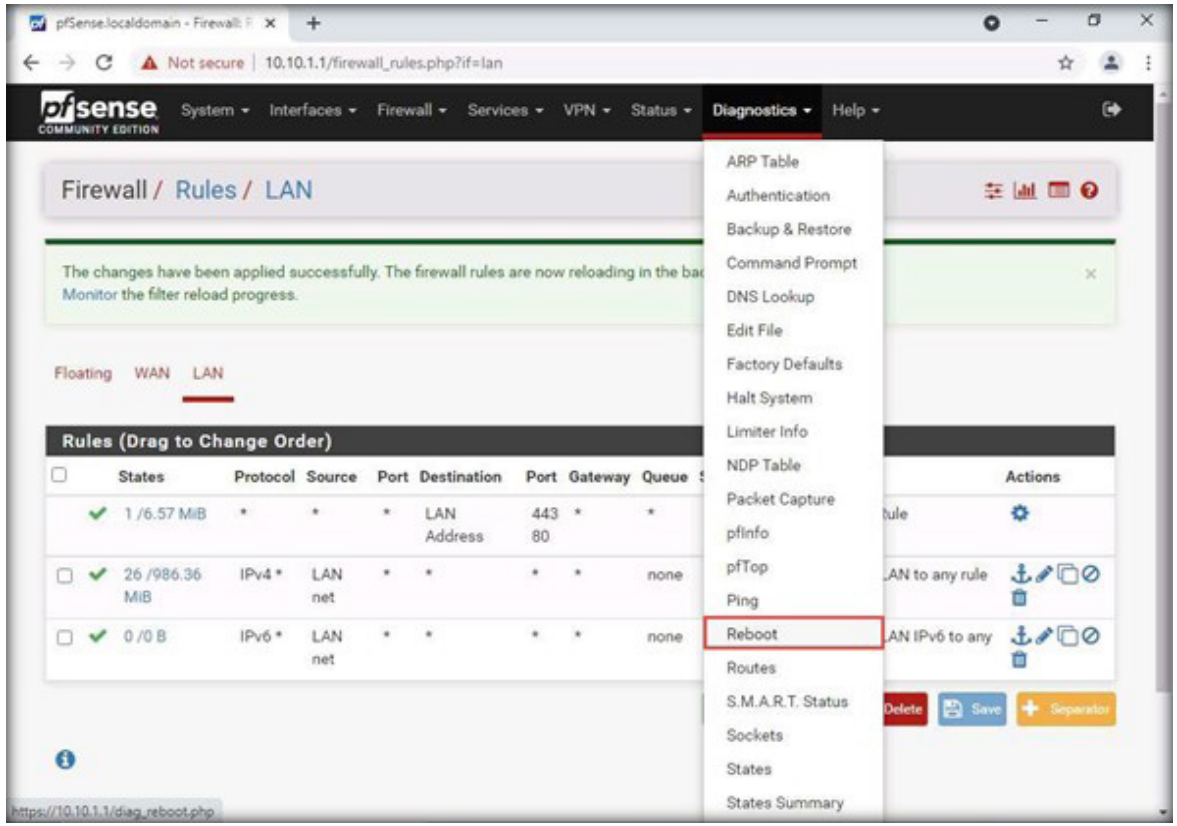
29. The selected rules will be deleted.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



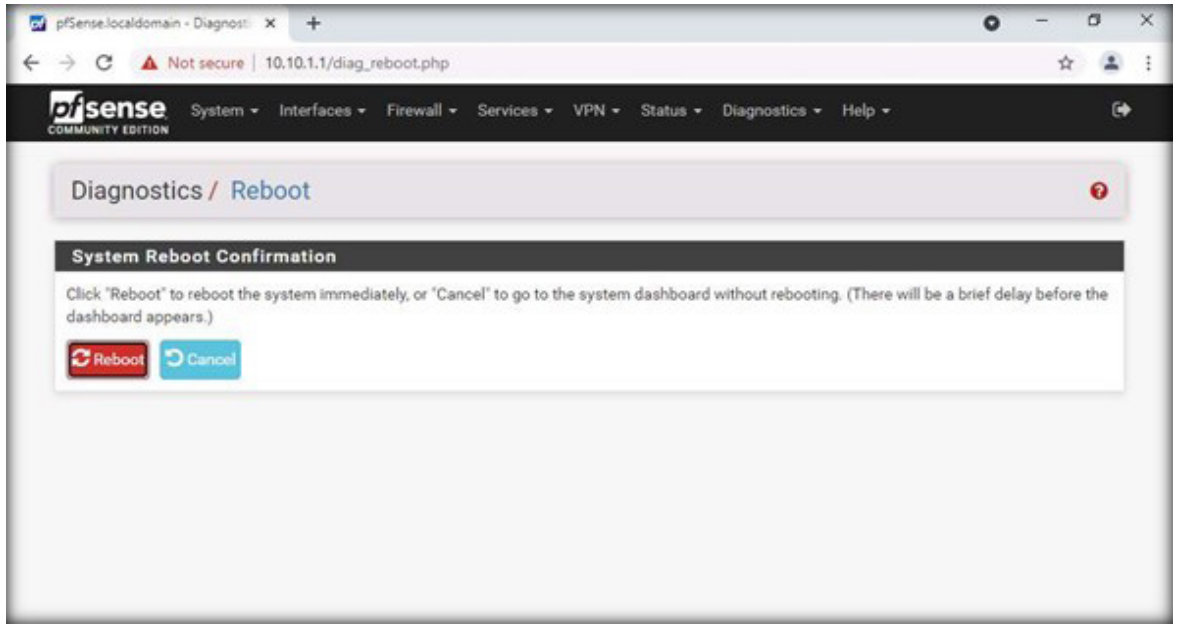
30. To reboot pfSense, navigate to **Diagnostics > Reboot** option from the main menu.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



31. Click on **Reboot** button.

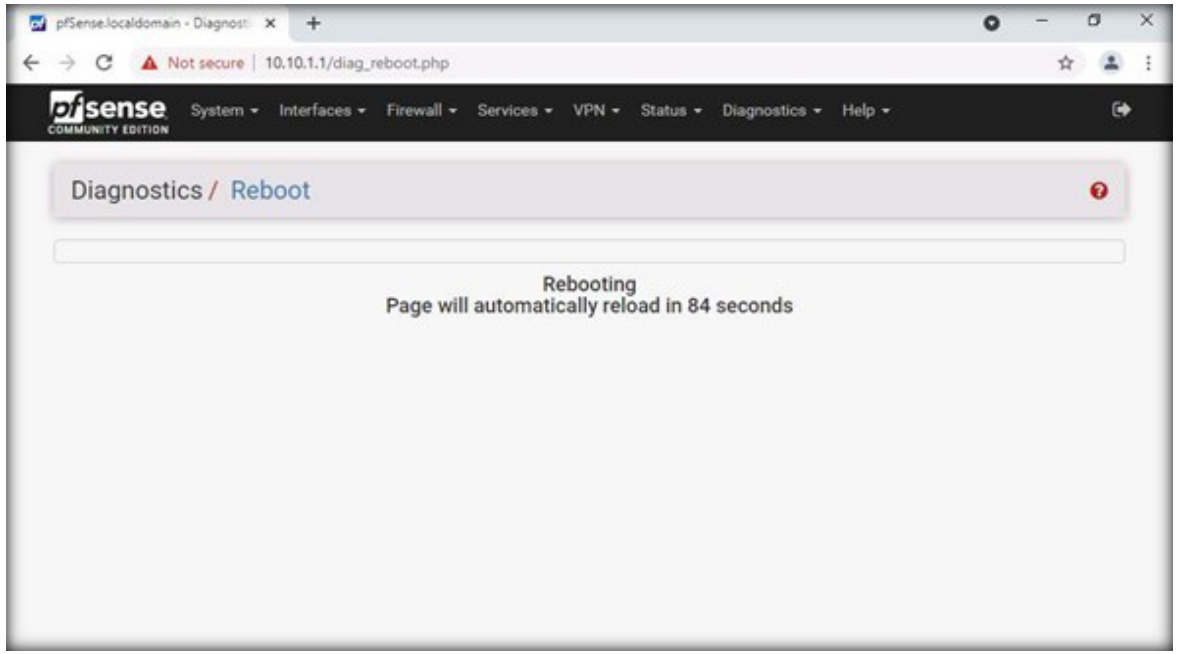
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



32. Click **OK** in the Reboot confirmation pop-up.

33. The pfSense firewall will reboot and load automatically.

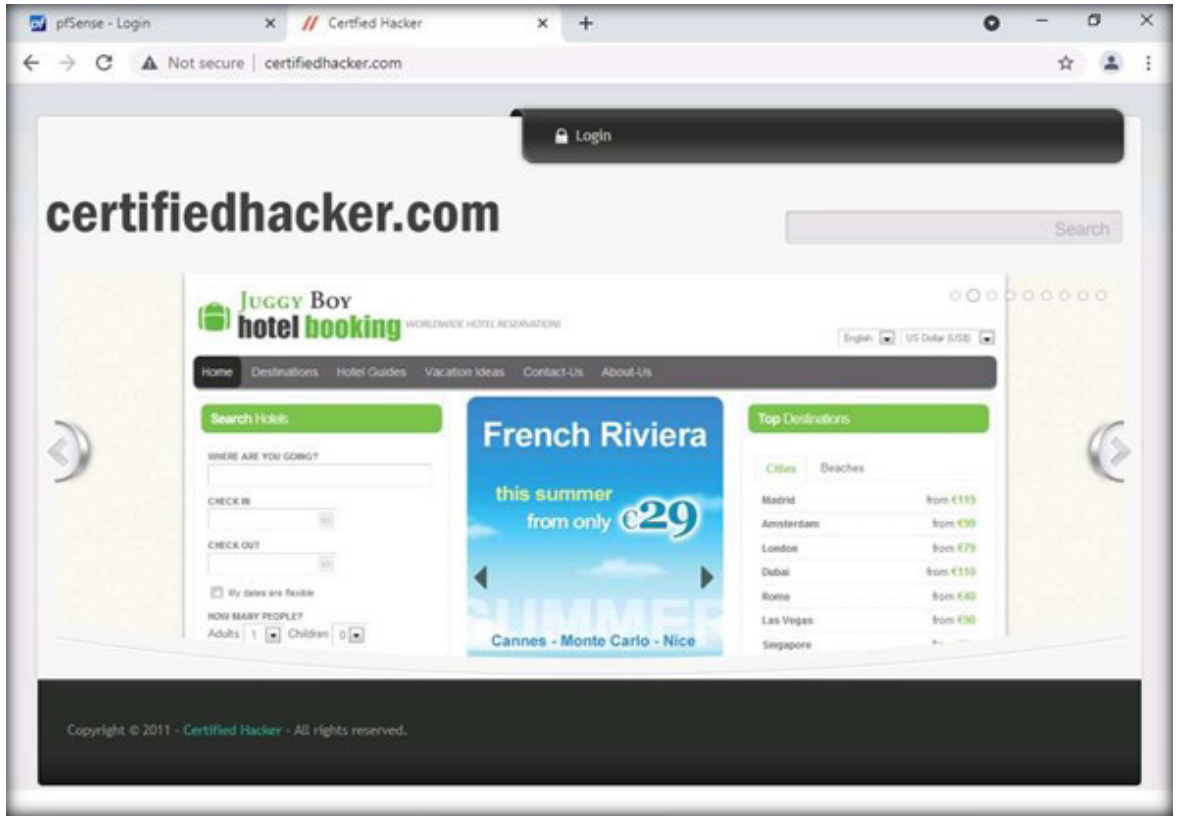
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



34. The pfSense Sign in page will appear.

35. Now Open a new tab in Chrome browser and type **http://certifiedhacker.com/** in the address bar, and press **Enter**. You will be able to access the web page as shown in the below screenshot:

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

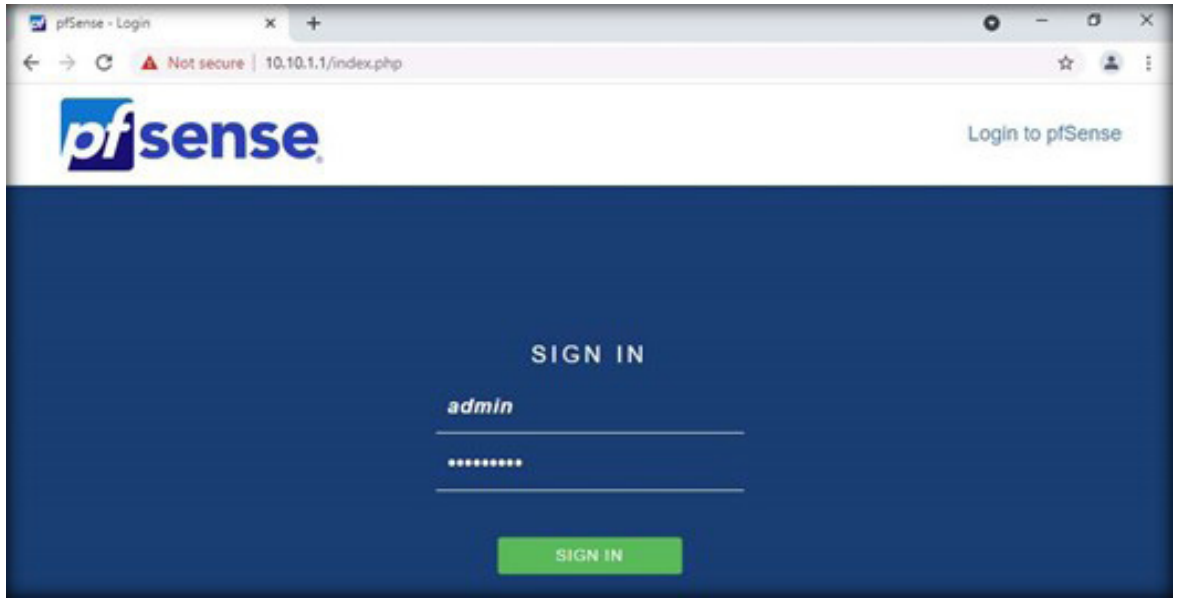


36. Close the tab and navigate to the pfSense **SIGN IN** page.

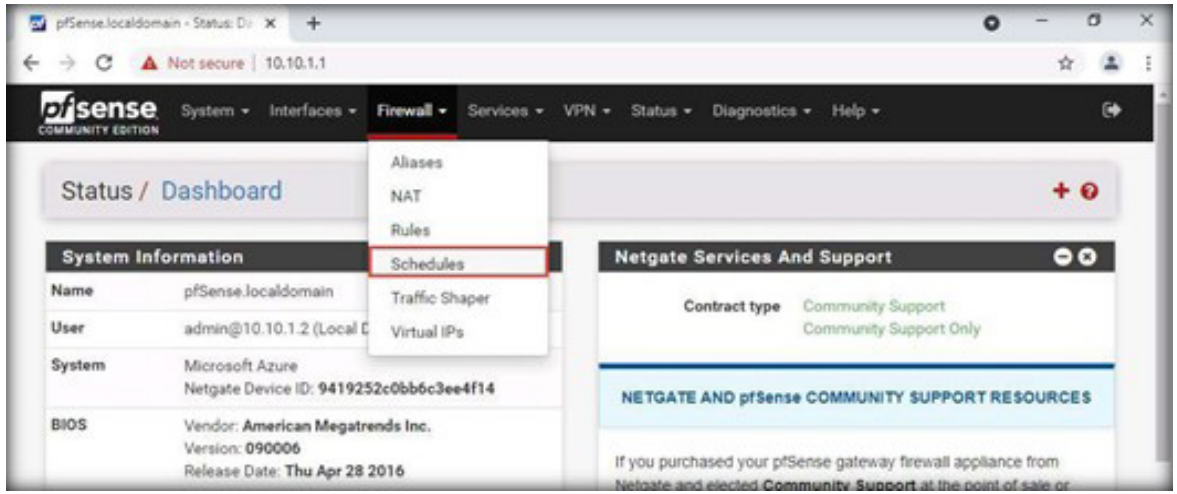
37. Now we will configure schedules for time-based rules

38. Type the username **admin** and password **admin@123** and click the **SIGN IN** button, as shown in the screenshot below.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

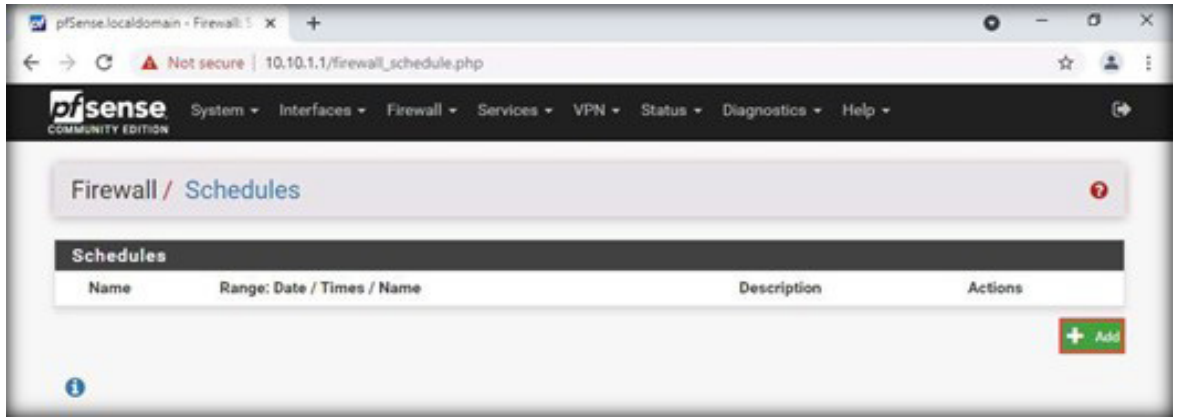


39. The pfSense Dashboard will appear. Navigate to **Firewall > Schedules** from the main menu.



EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

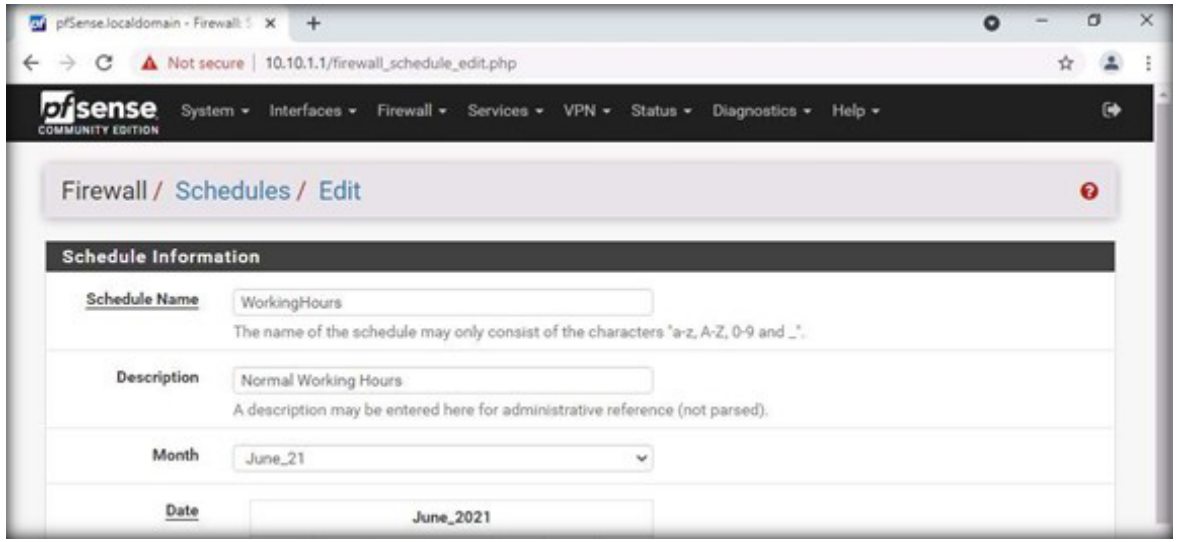
40. Click **+ Add** button in the **Firewall/ Schedules** window.



EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

41. The **Firewall/ Schedules/ Edit** window opens. Enter a name in the **Schedule Name** section under **Schedule Information** and enter description in the **Description** field.

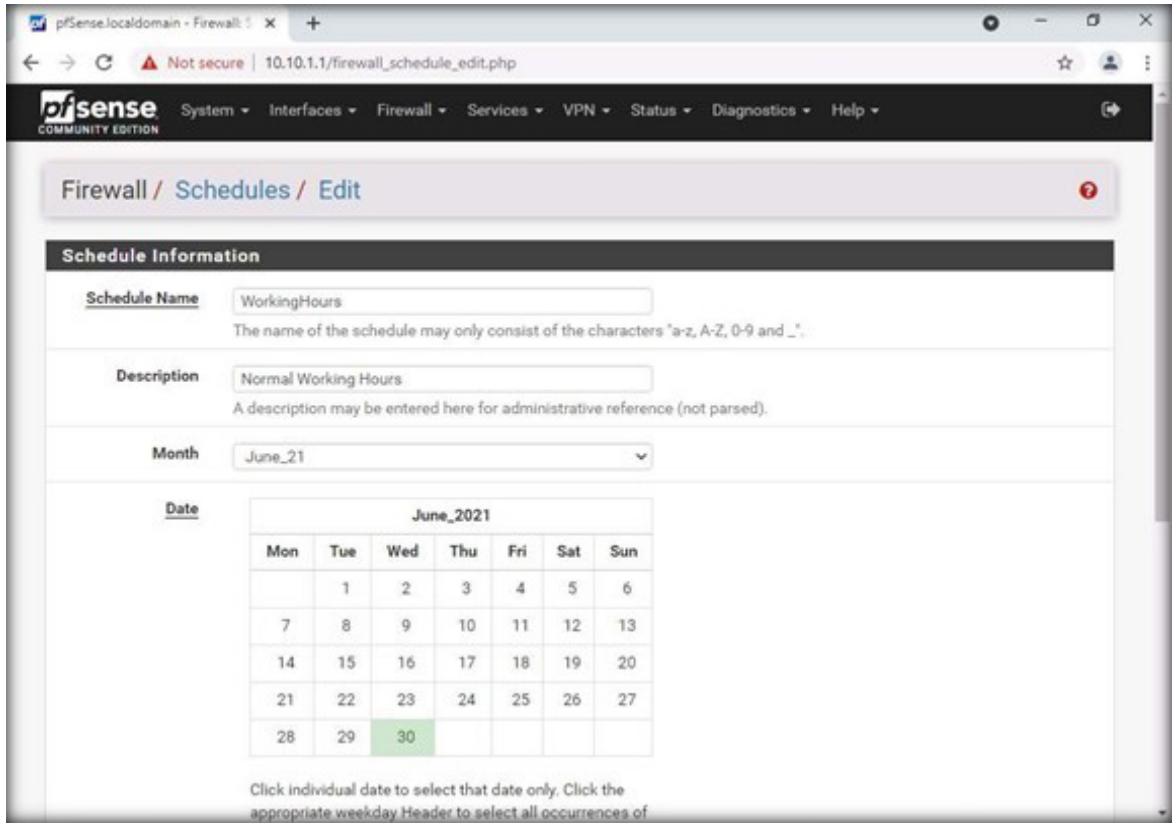
Note: Schedule name must only contain letters and digits, no spaces. Here we have given the name as **WorkingHours** and **Normal Working Hours** as **Description**.



EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

42. Now set the **Month** by selecting a specific month and days, or by clicking the day of the week header for weekly recurring schedules.
    Note: Here we are selecting a single day in a month.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

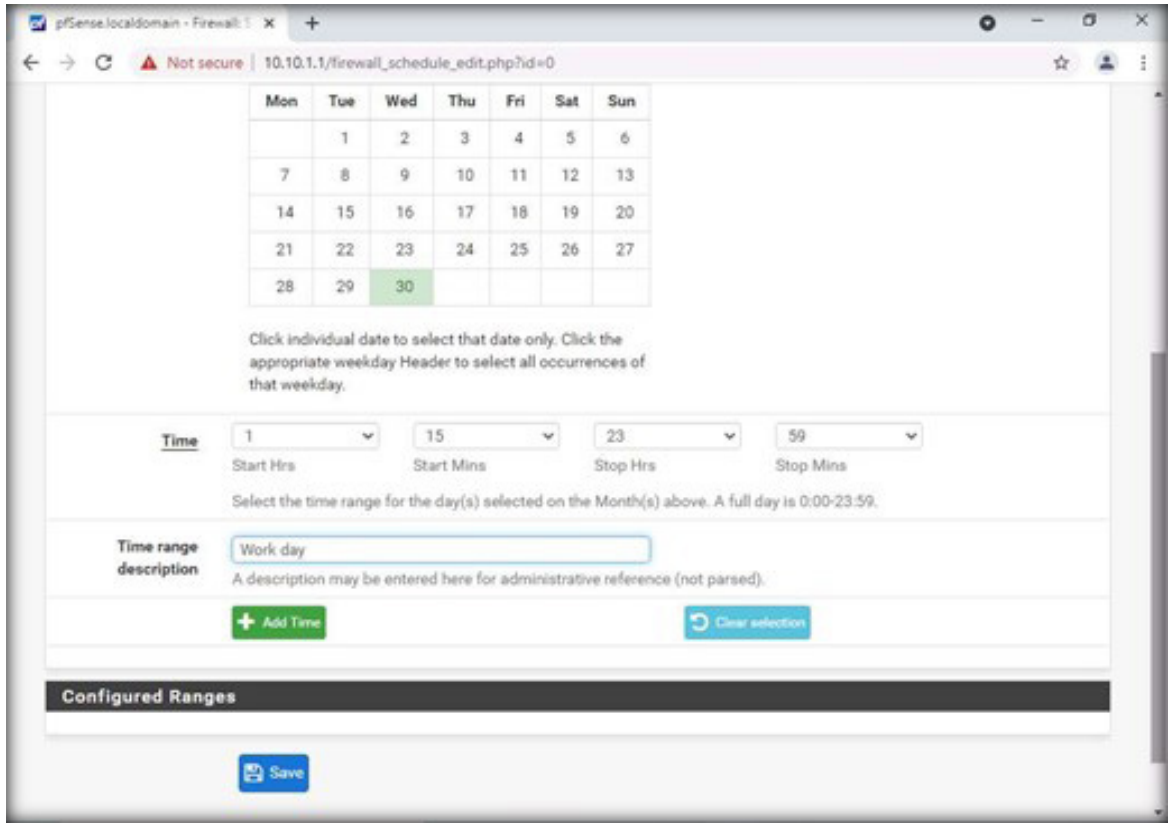


43. Choose a **Start Time** and **Stop Time** which control when the rule is active on the selected days. Enter an optional Time Range Description for this specific range.

Note: The time cannot cross midnight on any day. A full day is 0:00 to 23:59.

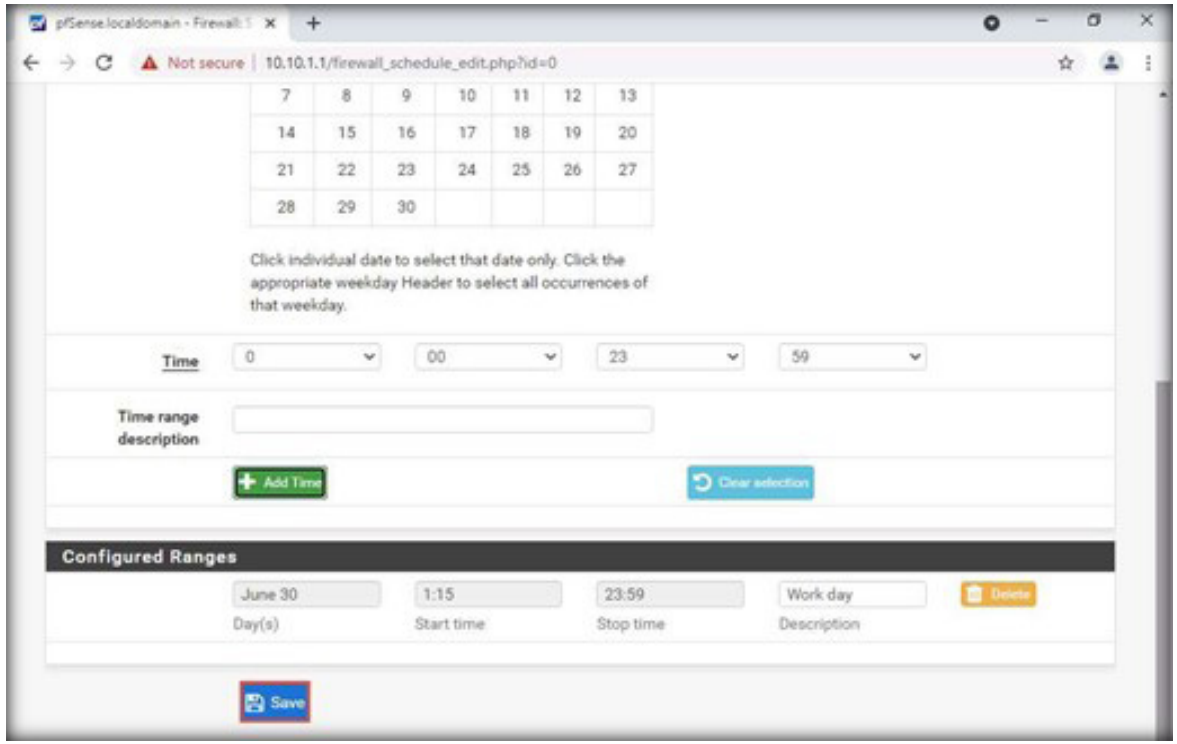
Note: While performing the task in the lab, make sure that the time you are selecting is 5 to 10 minutes ahead of the time.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

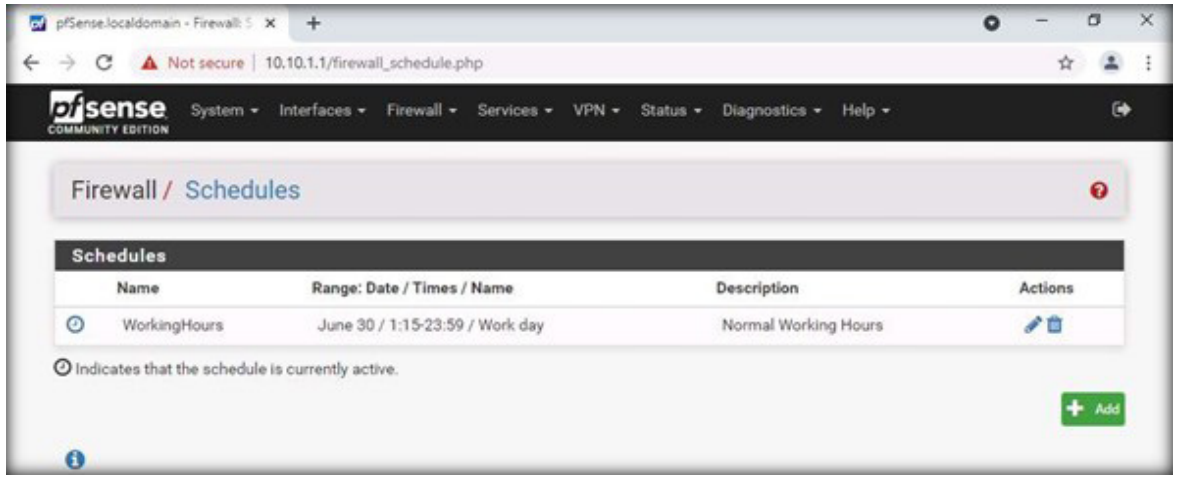


44. Click on **+ Add Time** to add the choices as range and click **Save**.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

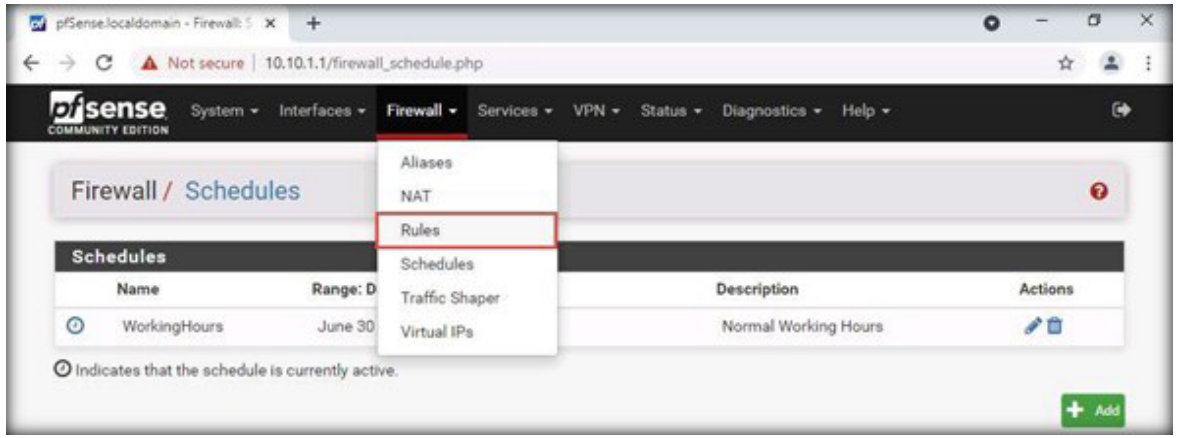


45. You will be redirected to the **Firewall/ Schedules** page with the new schedule listed.



EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

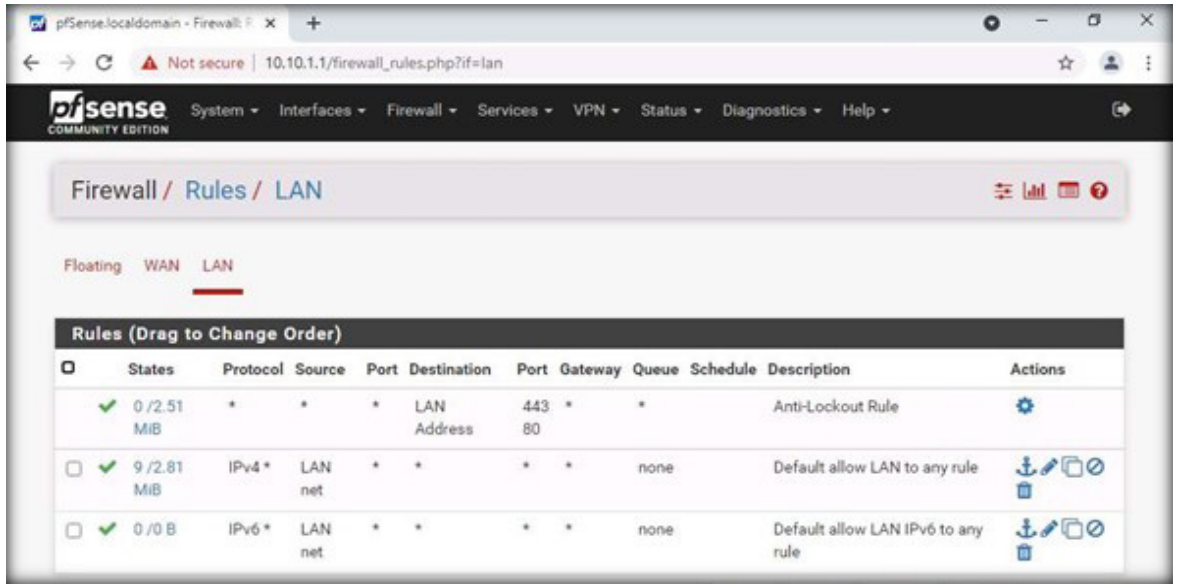
46. To create a new firewall rule, navigate to **Firewall > Rules** from the main menu.



EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

47. The **Firewall/Rules/WAN** page will appear. Click the **LAN** option.

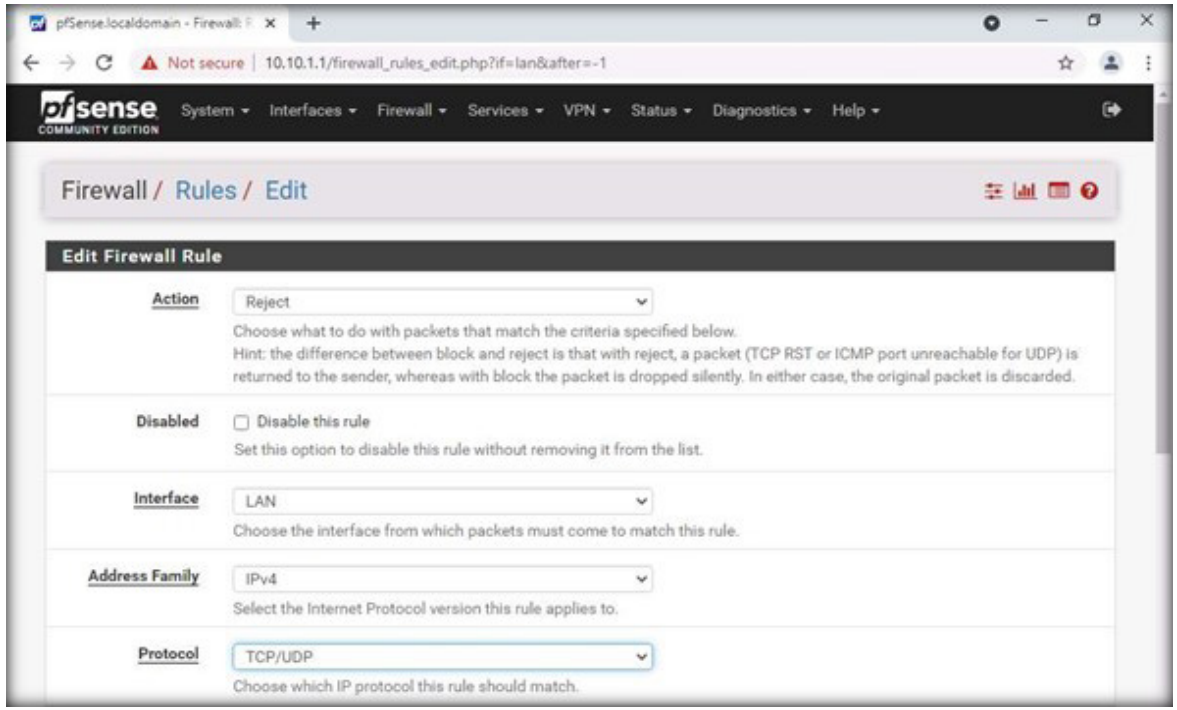
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



48. To create a rule, click the up arrow **Add** button.

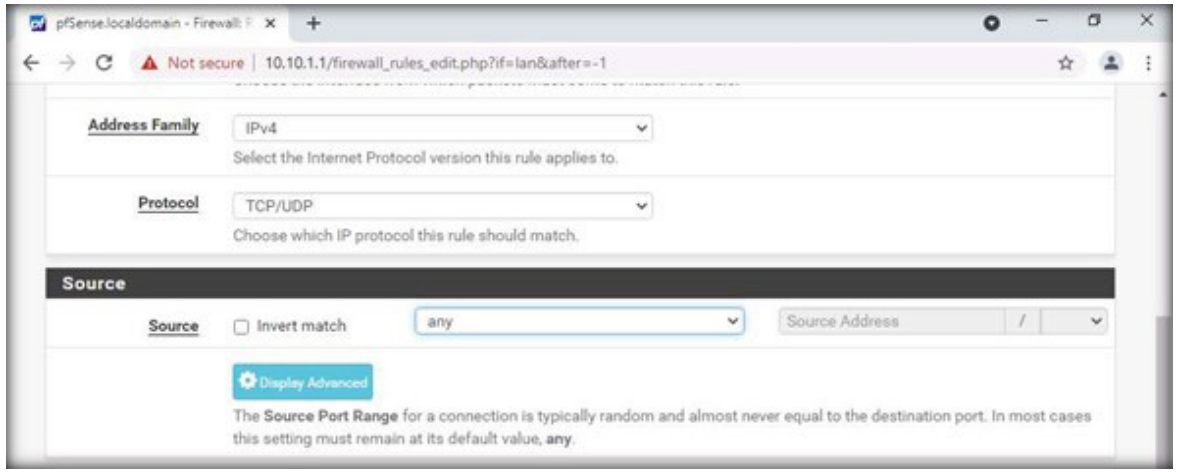
49. Set following details under **Edit Firewall Rule** section

- **Action** > Reject
- **Interface** > LAN
- **Address Family** > IPv4
- **Protocol** > TCP/UDP.



EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

50. Under **Source** section, select **any** from the dropdown as shown in the below screenshot.

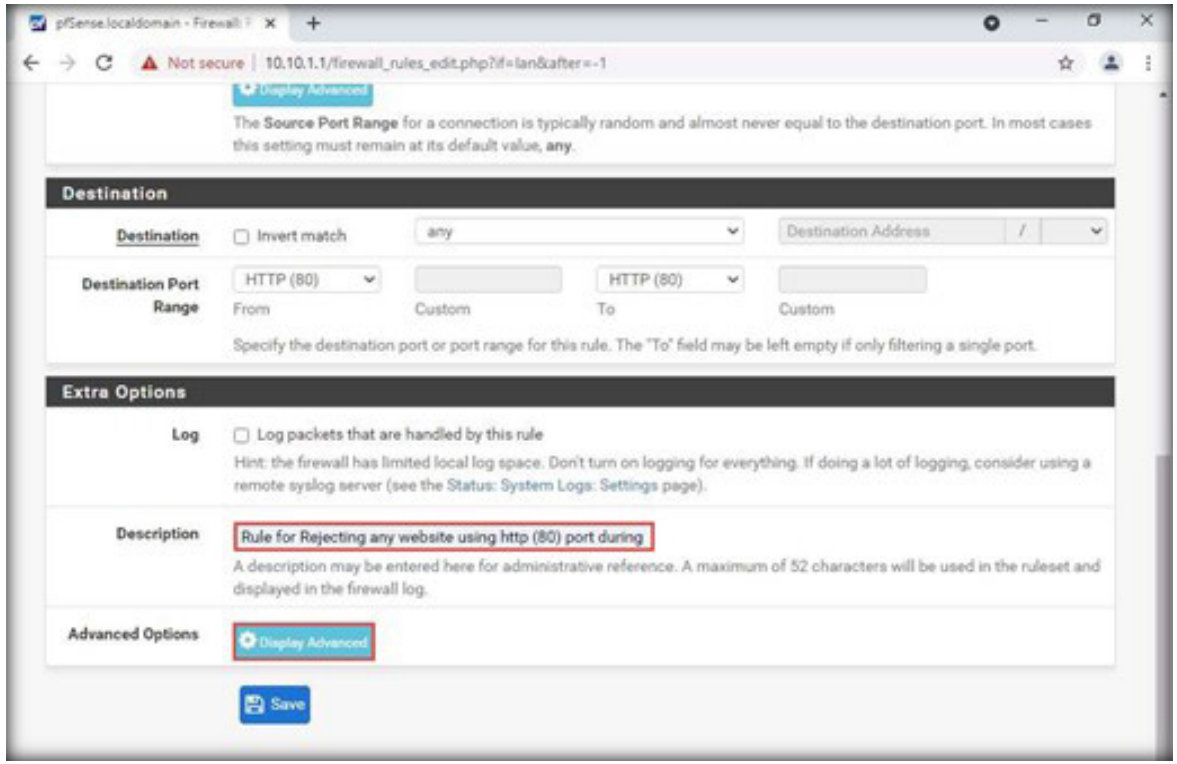


EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

51. Under **Destination** section, select **any** from the dropdown and set **Destination Port Range** to **HTTP (80)** from the dropdown.

52. Scroll down. Under **Extra Options**, enter **Rule for Rejecting any website using http (80) port during Working Hours** in the **Description** field, and click on **Display Advanced**.

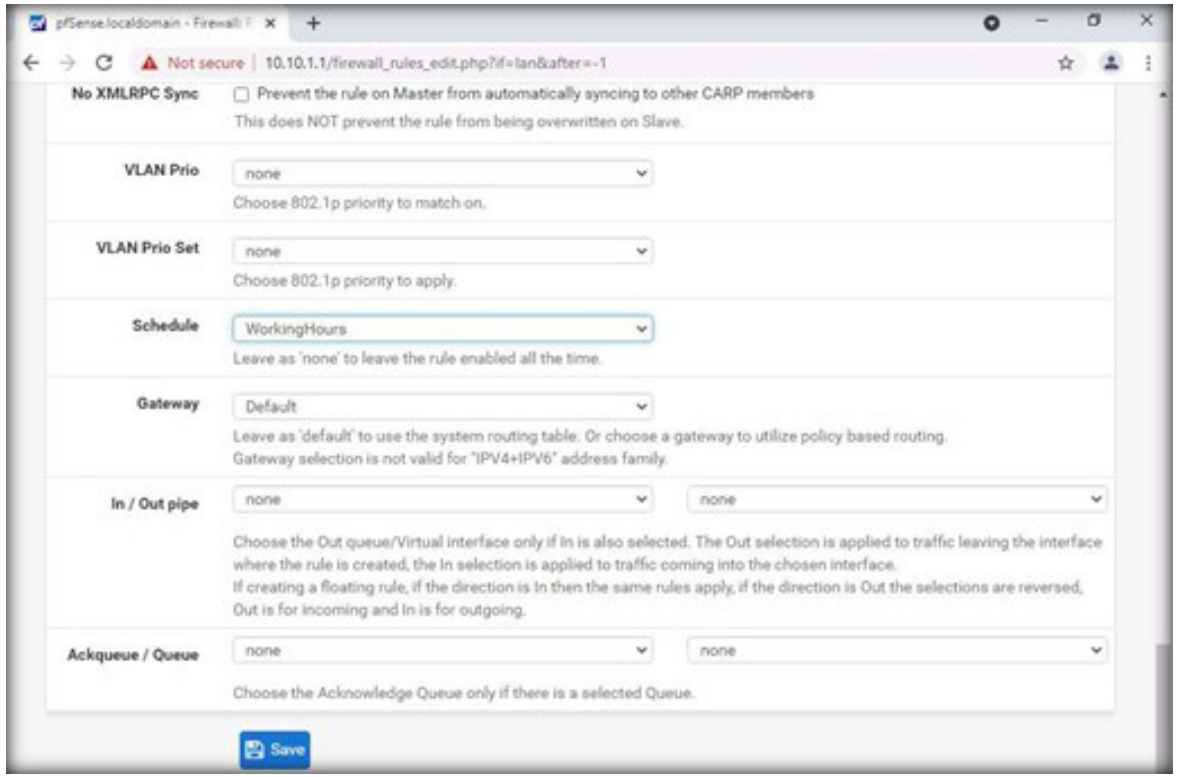
EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



53. In **Advanced Options** go to **Schedule** section and select the newly created **WorkingHours** Schedule from the drop down.

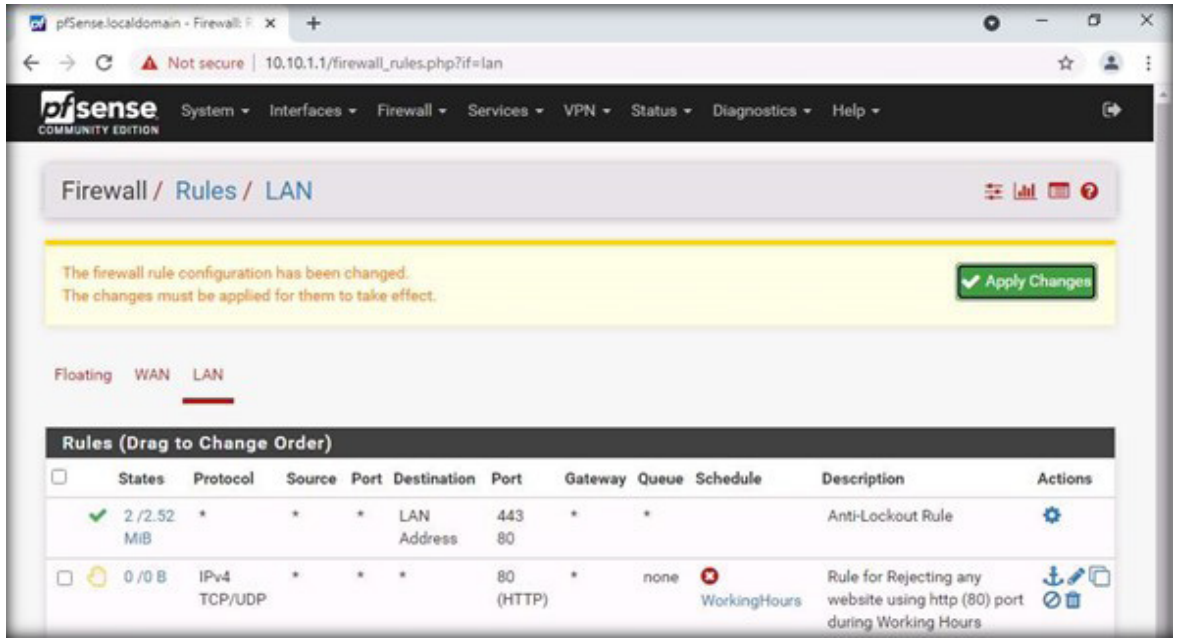
54. Leaving the other options set to default scroll down the page and click on **Save**.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



55. The page will redirect to the Firewall/Rules/LAN page. Click **Apply Changes**.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL

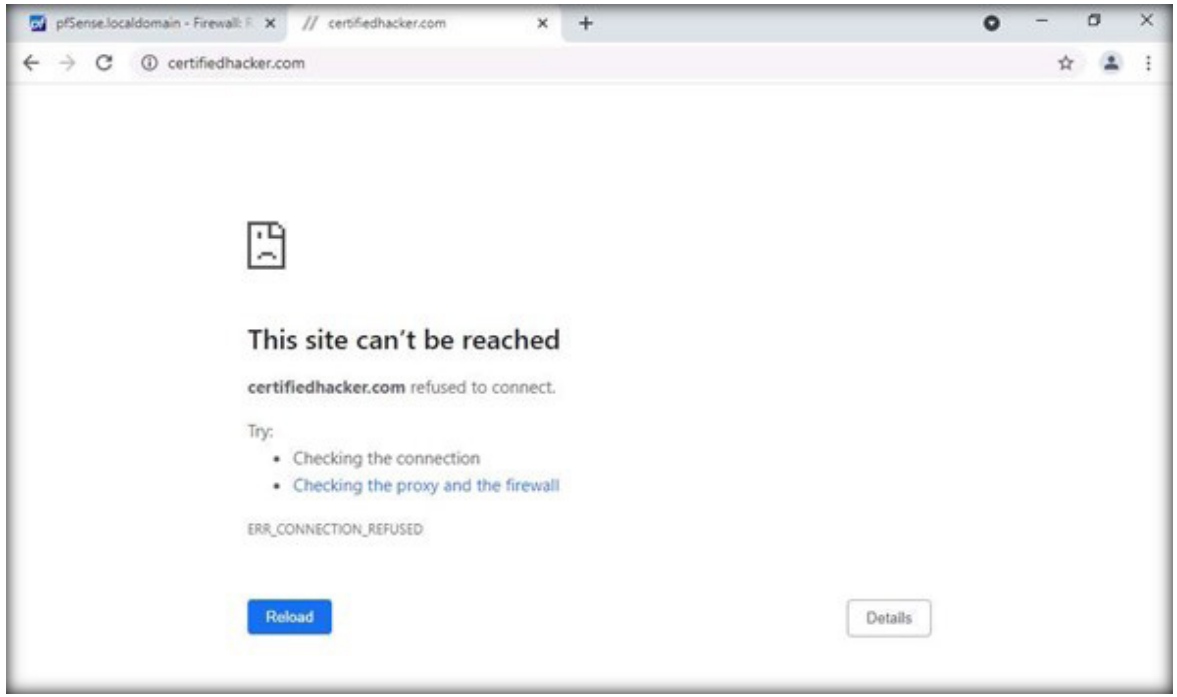


56. Reload the webpage and open a new tab in chrome browser and type **http://certifiedhacker.com/** in the address bar, and press **Enter**

Note: If a pop-up appears while reloading webpage, click on **Continue**.

Note: If changes are not affecting, then reboot the pfSense firewall and clear the Chrome browser cache.

EXERCISE 4: IMPLEMENT NETWORK-BASED FIREWALL FUNCTIONALITY: BLOCK INSECURE PORTS USING PFSENSE FIREWALL



57. You will see the message as **This site can't be reached**. This is because the pfSense firewall rule is now preventing port http.

58. Delete the newly created firewall rule before proceeding to the next lab.

59. Close the current tab and perform **Step 25** to **Step 34** to delete the newly created rule and to reboot the pfSense firewall.

60. After the pfSense firewall is rebooted, close all open windows.

61. Turn off **Admin Machine-1** and **AD Domain Controller** virtual machines.

EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

Host-based Intrusion Detection Systems (HIDS) detect the events on the server and generate alerts.

LAB SCENARIO

Intrusion Detection Systems (IDS) helps monitor network activity. HIDS enables a security professional to monitor the network traffic for malicious activity or policy violations. Using Wazuh enables security professionals to perform continuous monitoring and respond to advanced threats.

LAB OBJECTIVE

This lab will demonstrate the use of Wazuh HIDS and agent to capture network traffic and show how to monitor the captured traffic for malicious activities. In this lab, you will learn the following:

- Installing and configuring Wazuh HIDS and Wazuh agent
- Monitoring network traffic for malicious activity using Sguil

OVERVIEW OF THE LAB

Host Intrusion Detection is a requirement for today's networks. Attacks and threats can be monitored easily because the full communication stream can be inspected using HIDS. Host-based IDS (HIDS) deployment is done with proper planning and care, as deploying these on a large-scale environment has the potential to generate numerous false alarms, which can get quite difficult to manage. Initial deployment of a HIDS is done on critical servers only. Security professional must consider implementing an IDS management console before adding additional hosts.

LAB TASKS

Note: Ensure that **Web Server** and **PfSense Firewall** virtual machines are running.

EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

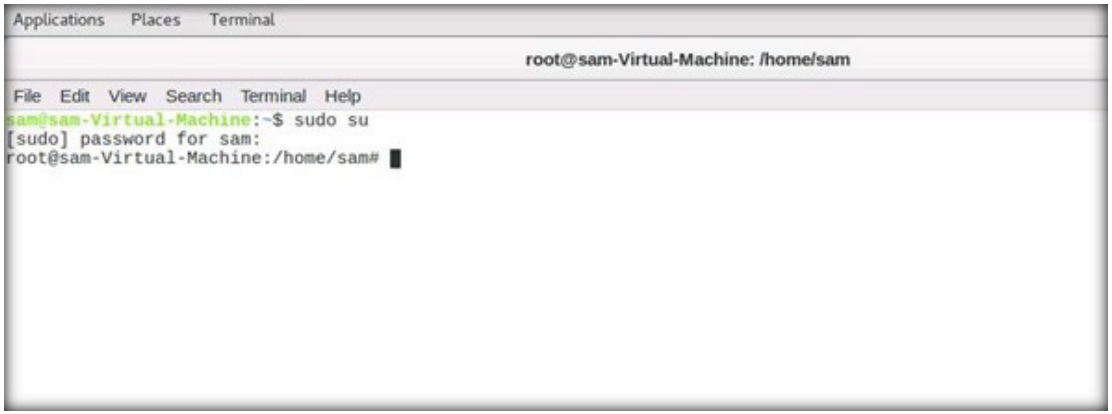
1. Turn on **Admin Machine-2** and **Attacker Machine-1** virtual machines.

2. Log in with the username **sam** and password **admin@123**.

3. To configure Wazuh HIDS for detecting endpoint suspicious activity, right-click on the desktop, and select the **Open Terminal** option from the pop-up list as shown in the screenshot below.

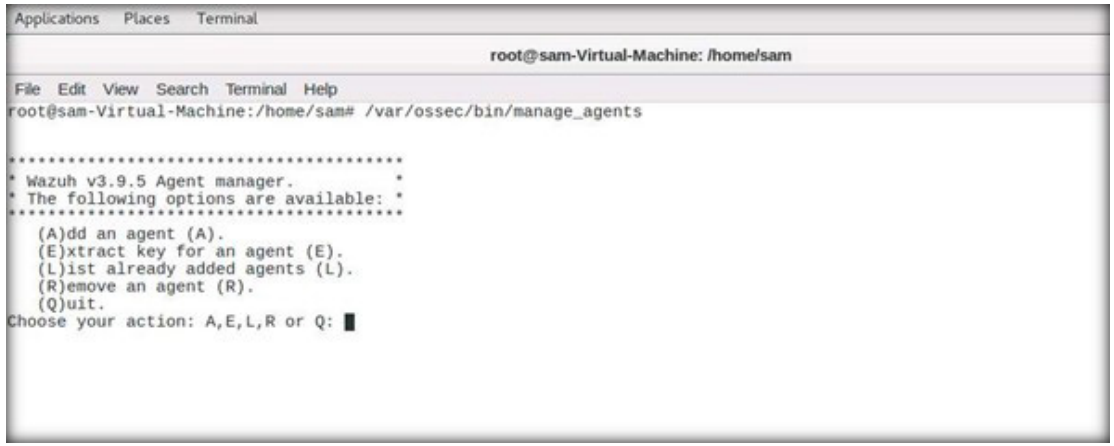
4. When the terminal window appears, type command **sudo su**, and press the **Enter** button. When it prompts for the password, type the system password **admin@123** and press **Enter**.

Note: The password that you type will not be visible.



EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

5. To add the **Web Server** virtual machine as the Wazuh agent, type command **/var/ossec/bin/manage_agents** and press **Enter**, as shown in the screenshot below.



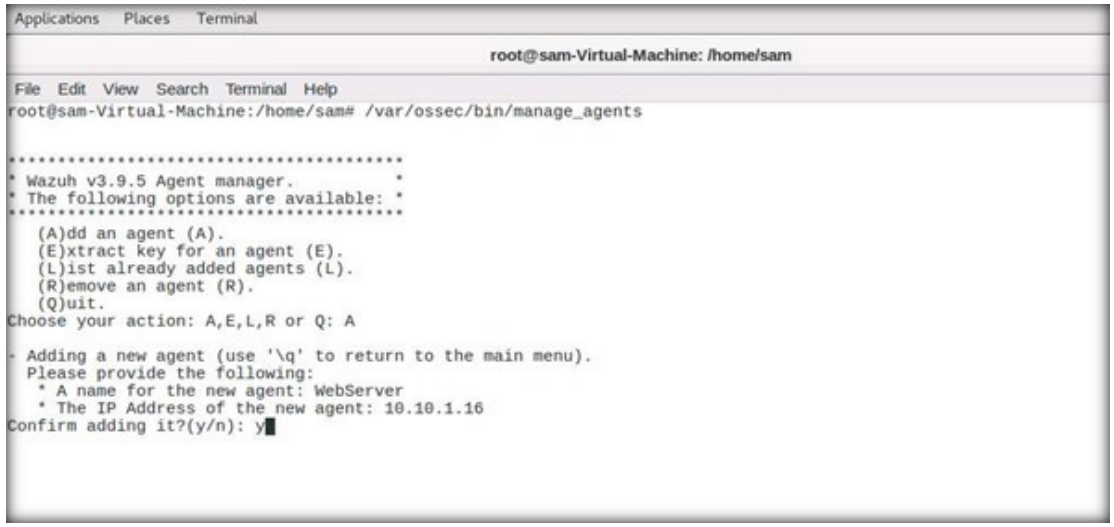
EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

6. The list of options is displayed. Type **A** to add the new agent (**Web Server**) for the monitor and press **Enter**.

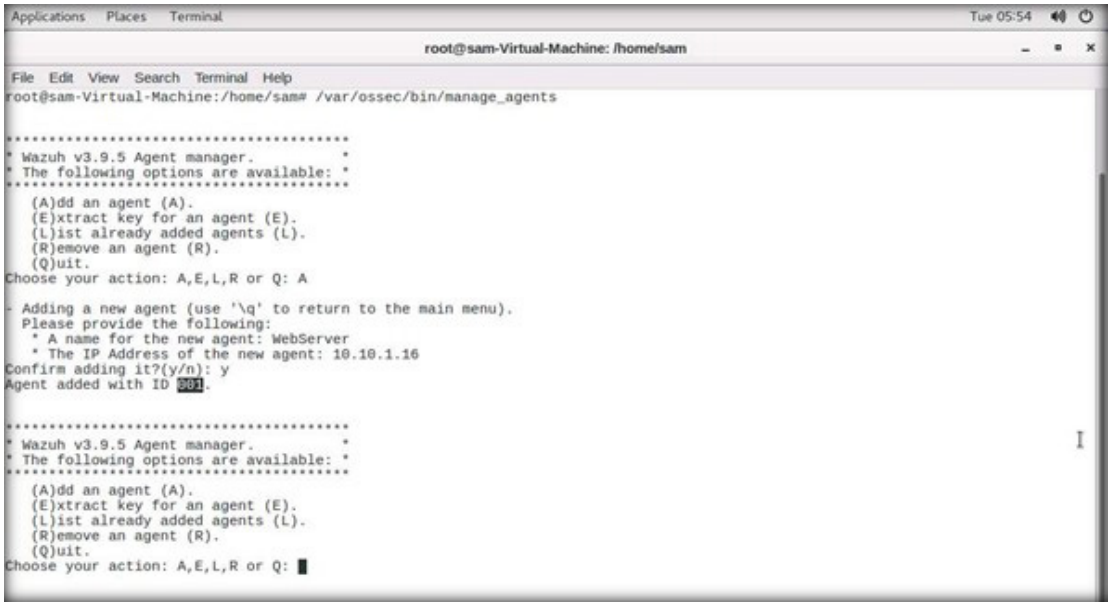
7. You will be prompted to add new agent details. Provide the following details as shown in the screenshot below, and press **Enter**:

- **A name for the new agent**: WebServer
- **The IP address of the new agent**: 10.10.1.16
- **Confirm adding it? (y/n)**: y

EXERCISE 5:
IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS



8. The Wazuh agent manager will add a new agent. The agent ID here is **001**. (It may differ in your lab).



EXERCISE 5:
IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

9. To extract the key for the agent (WebServer), type **E** and press **Enter**. You will be prompted to provide the agent ID to extract the key. Type **001** (In your lab, it may differ).

EXERCISE 5:
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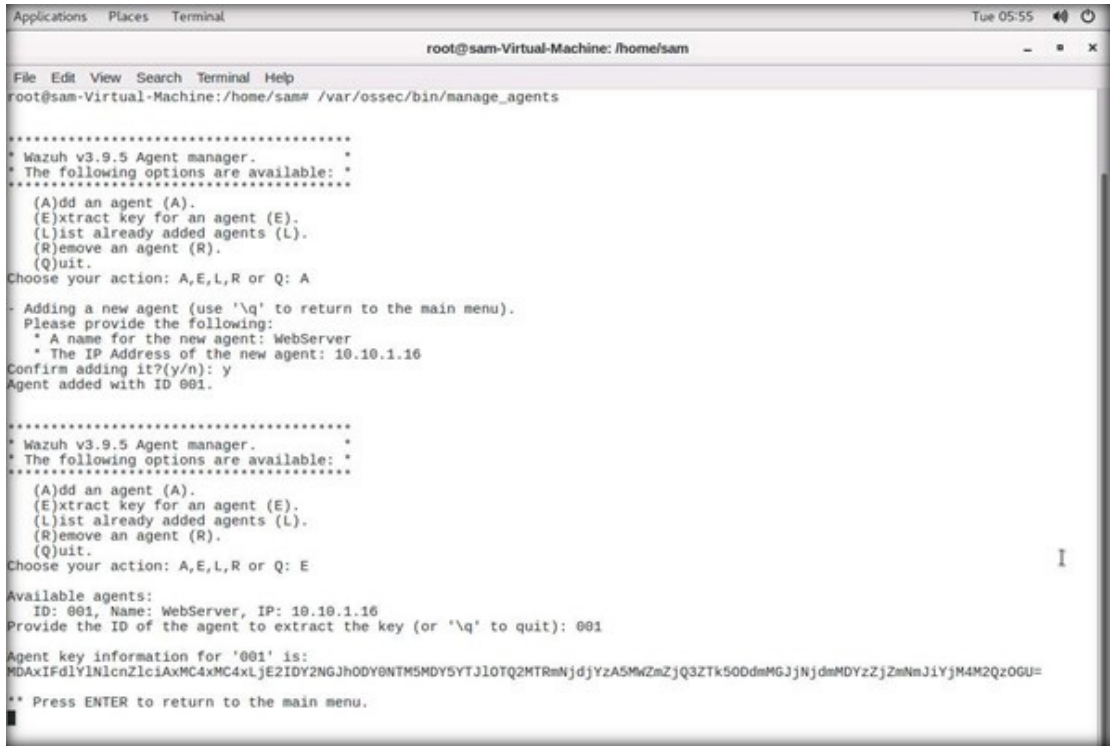
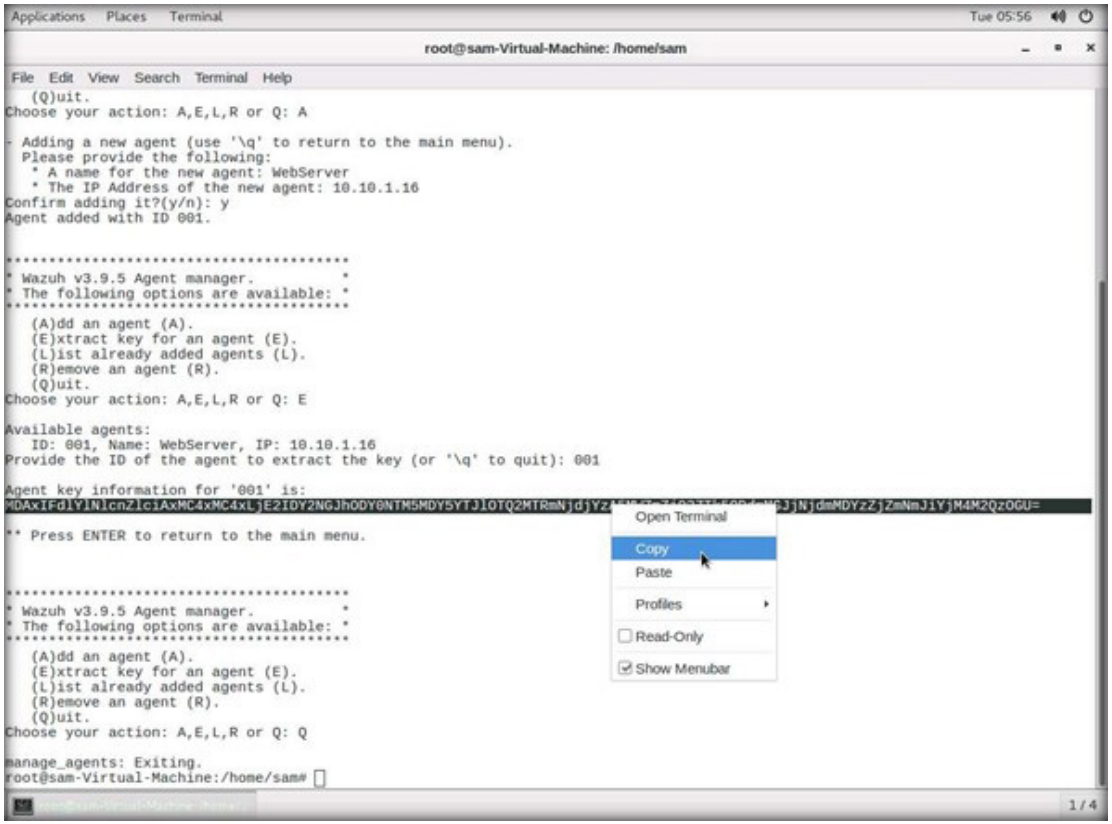


EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

10. Press **Enter** to continue, and type **Q** to quit agent configuration. **Copy** the extracted **key**.



11. Open another terminal window and type **sudo gedit key.txt**. Press **Enter**. If prompts for password type **admin@123** as password.
    Note: The password that you type will not be visible.

EXERCISE 5:
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12. The new **key.txt** file opens. Paste the **copied extracted key**.

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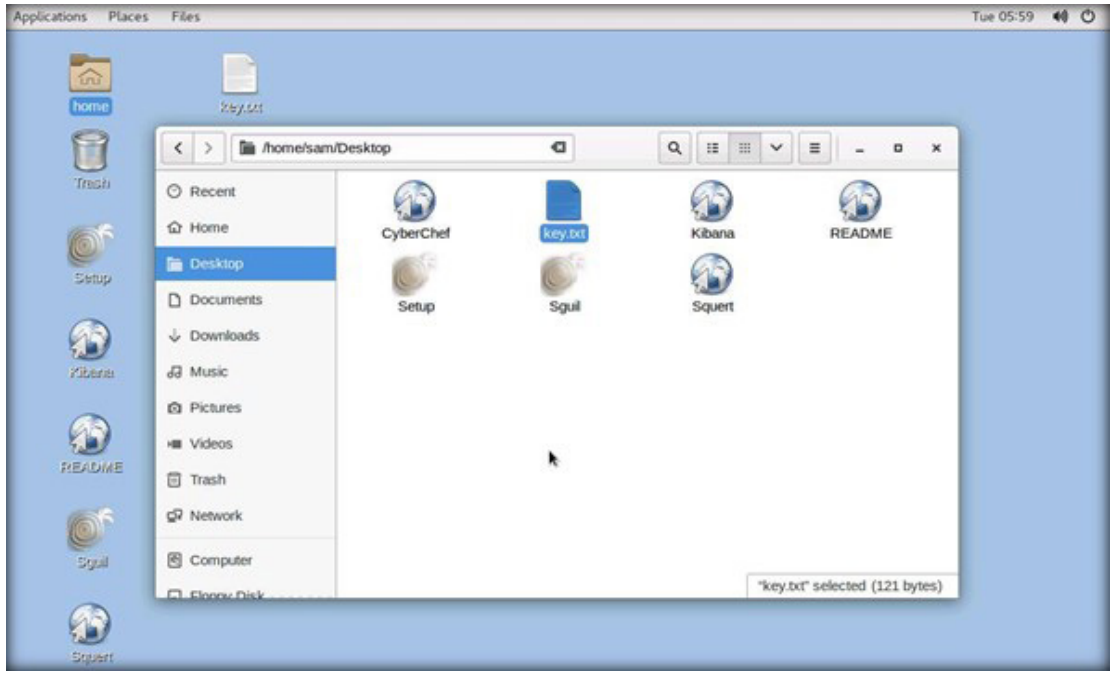
WAZUH HIDS

13. **Save** the file. Close all windows. Open **home** folder from **Desktop**, copy **key.txt** file to Desktop.



EXERCISE 5:
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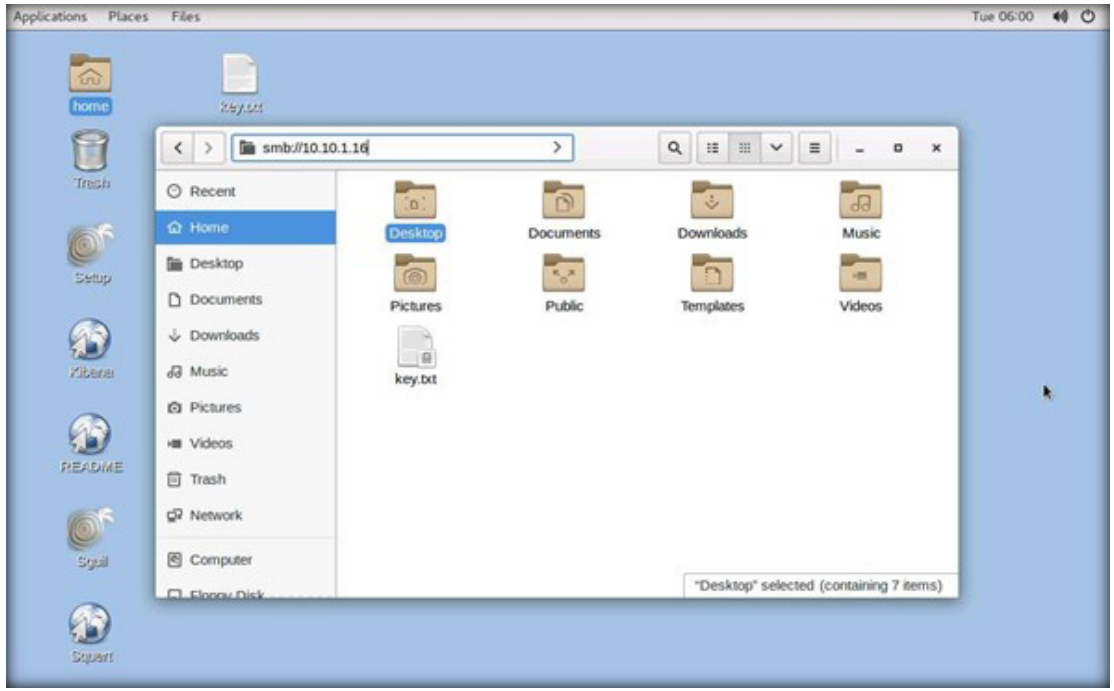
14. Open the **home** folder from the Desktop and press **CTRL + L** This will enable the search textbox. Type **smb://10.10.1.16** and press the **Enter** button.



EXERCISE 5:
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15. If prompted to enter the password, type the username **Administrator** and password **admin@123**. Click **Connect**.

16. The Windows share folder opens, open **C$** folder. Go to the desktop and copy the **key.txt** file. Switch back to the Windows share folder, open the **C$** folder, and paste the **key.txt** file.

EXERCISE 5:
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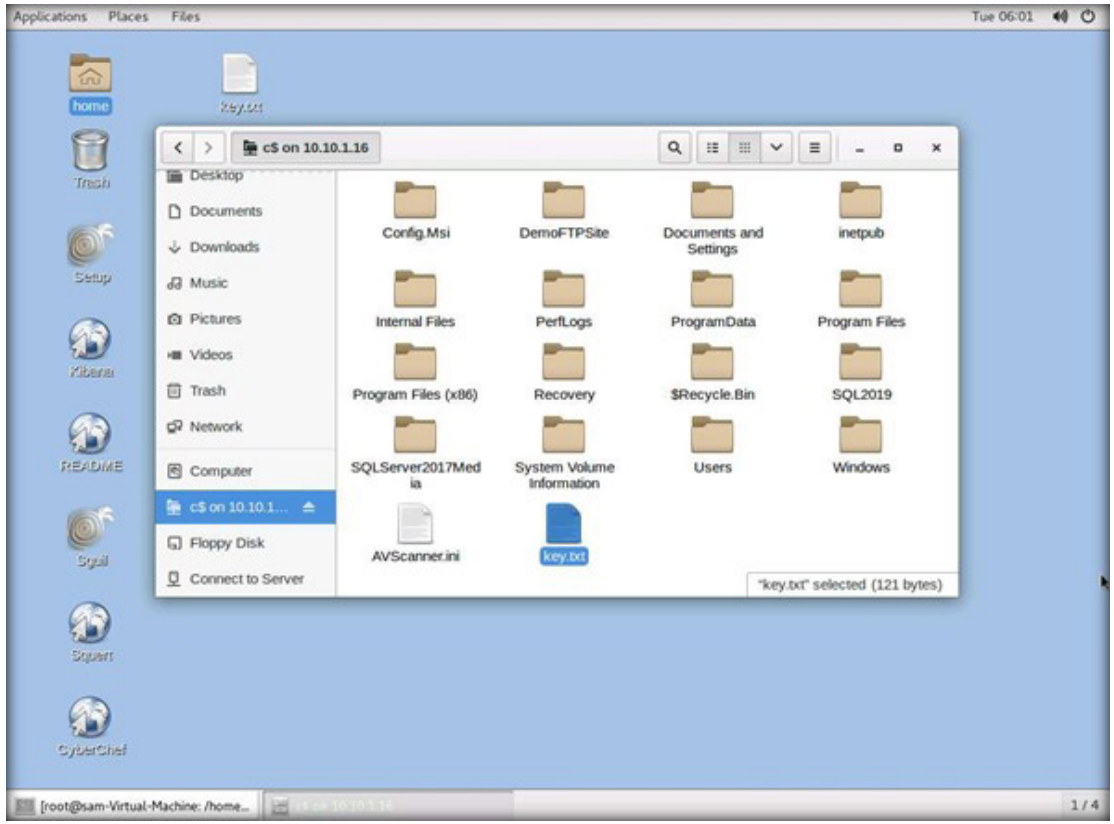
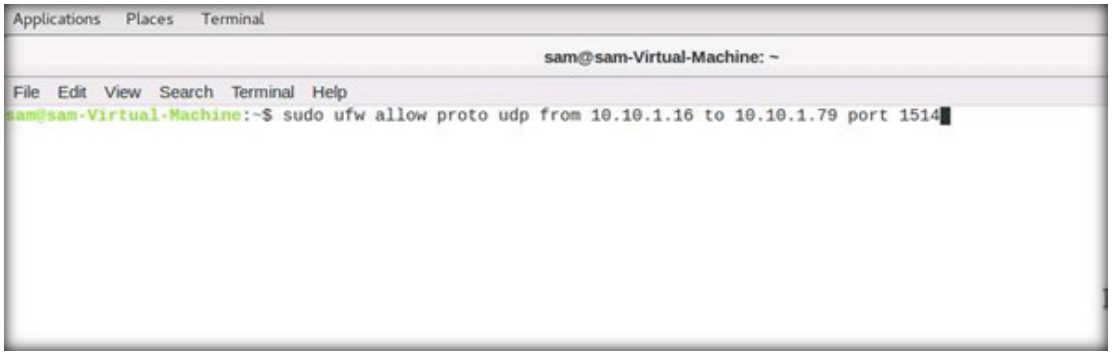


17. We have shared the agent key to **Web Server**. To configure the firewall to communicate with the agent, open terminal and type **sudo ufw allow proto udp from 10.10.1.16 to 10.10.1.79 port 1514** as shown in the screenshot below, and press the **Enter** button, if prompts for the password, then type **admin@123** as password and press **Enter** button.



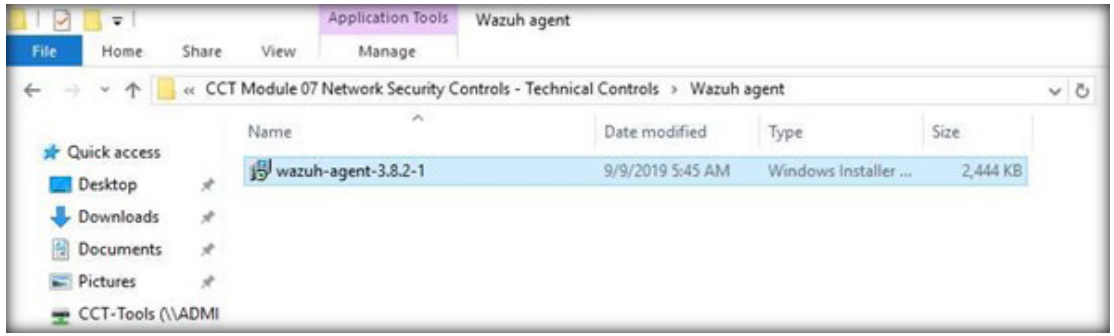
EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

18. The firewall will be configured to allow communication between **Web Server** and **Admin Machine-2** machines.

19. Switch to the **Web Server** virtual machine.

    Note: If you are not logged into the **Web Server** virtual machine, then log in using credentials **Administrator** and **admin@123**.

20. Navigate to **Z:\CCT Module 07 Network Security Controls - Technical Controls\Wazuh agent**. Double click **Wazuh-agent-3.8.2-1** and follow the wizard-driven installation.



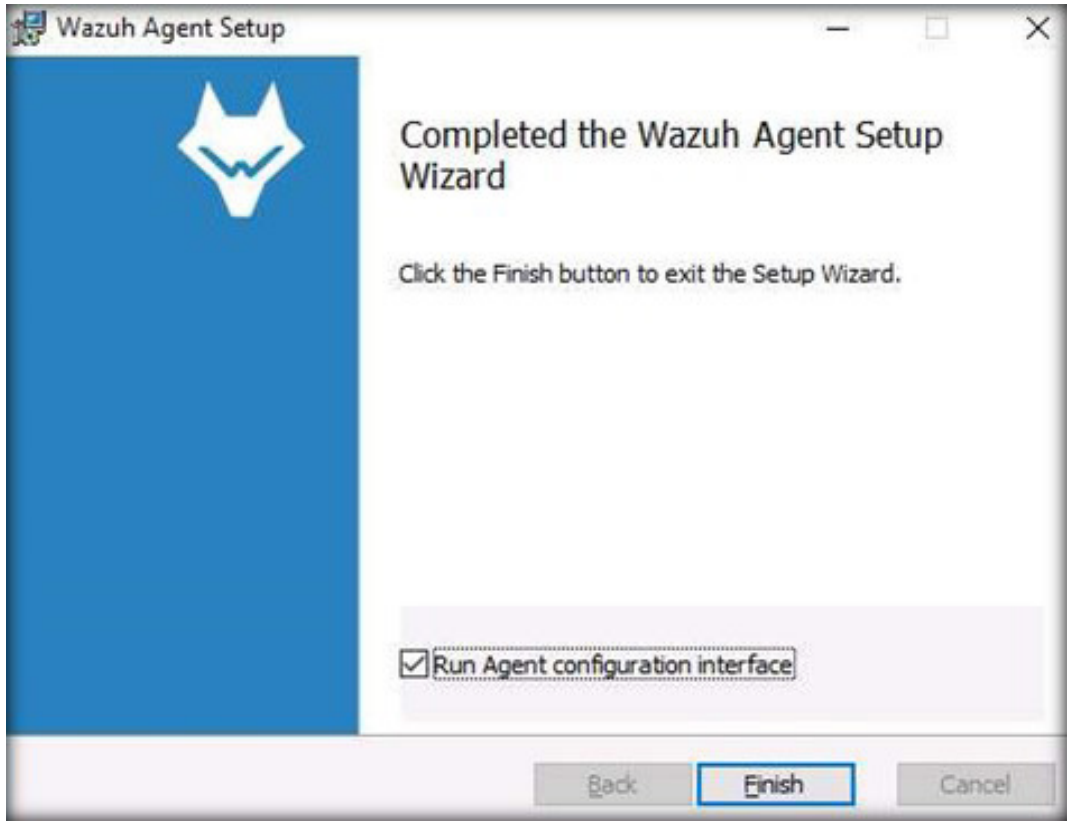
EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

Note: If an **Open File-Security Warning** appears click **Run**.

21. Check **I accept the terms in the License Agreement** and click **Install**.

22. Check **Run Agent configuration interface** and click **Finish** to complete the installation.

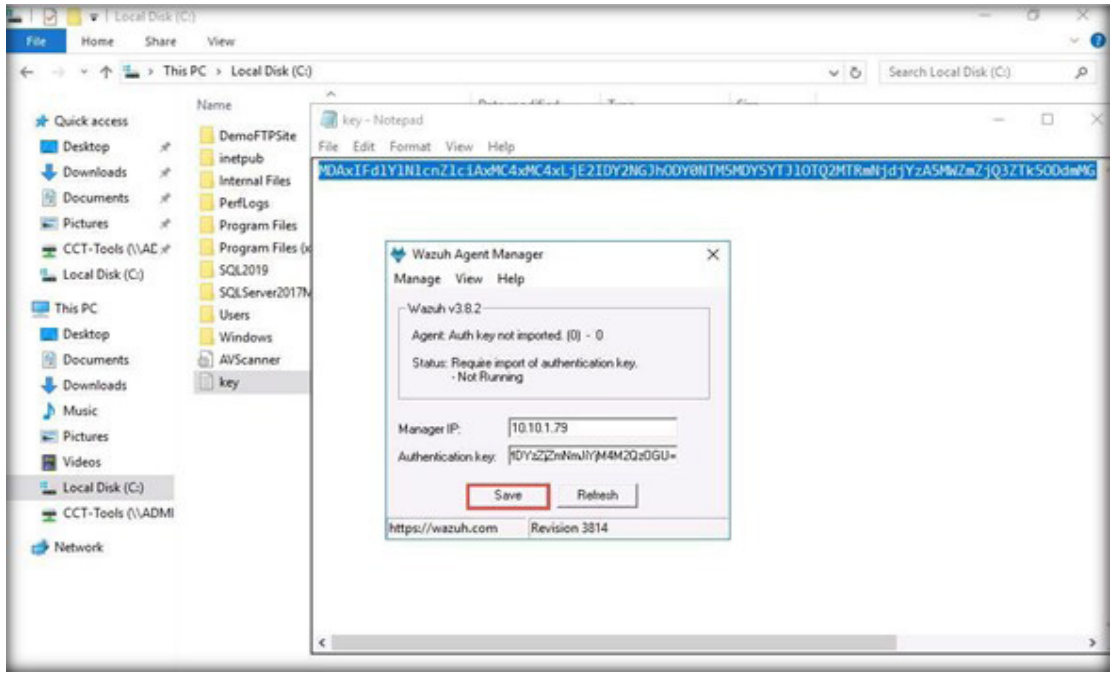
EXERCISE 5:
IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS



23. Once the installation is complete, the Wazuh Agent Manager window will open.

24. Type the IP address (**10.10.1.79**) of the Wazuh manager that is **Admin Machine-2** into the Manager IP field. Copy the agent key from the shared **C:\key.txt file** and paste into the Authentication key field. Click **Save**.

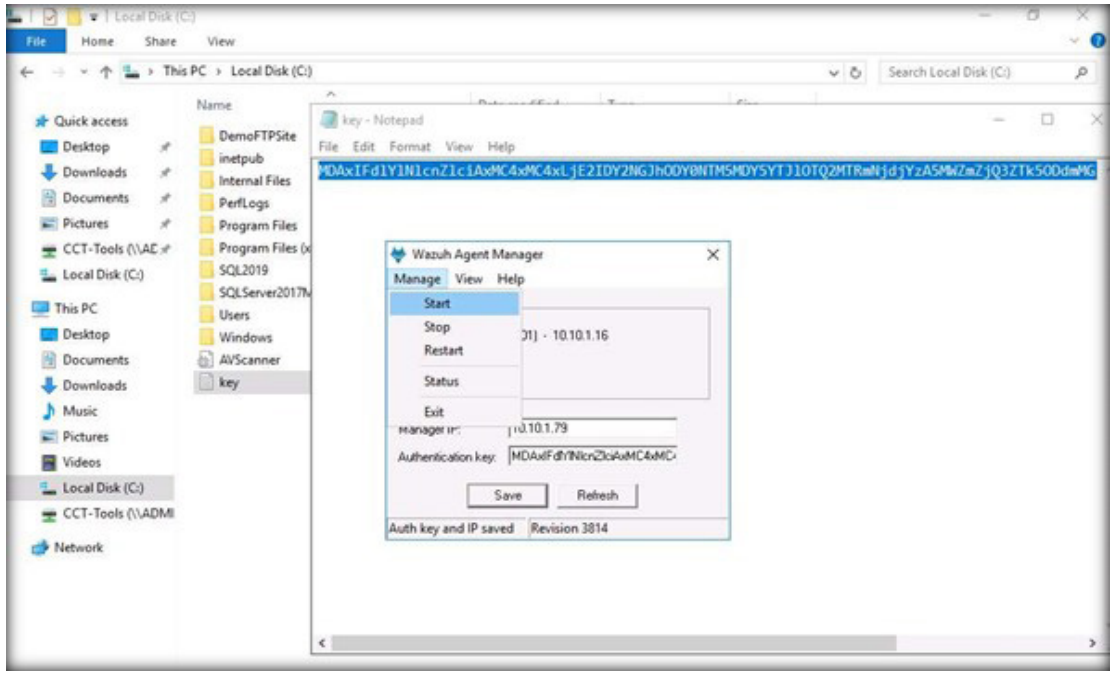
EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS



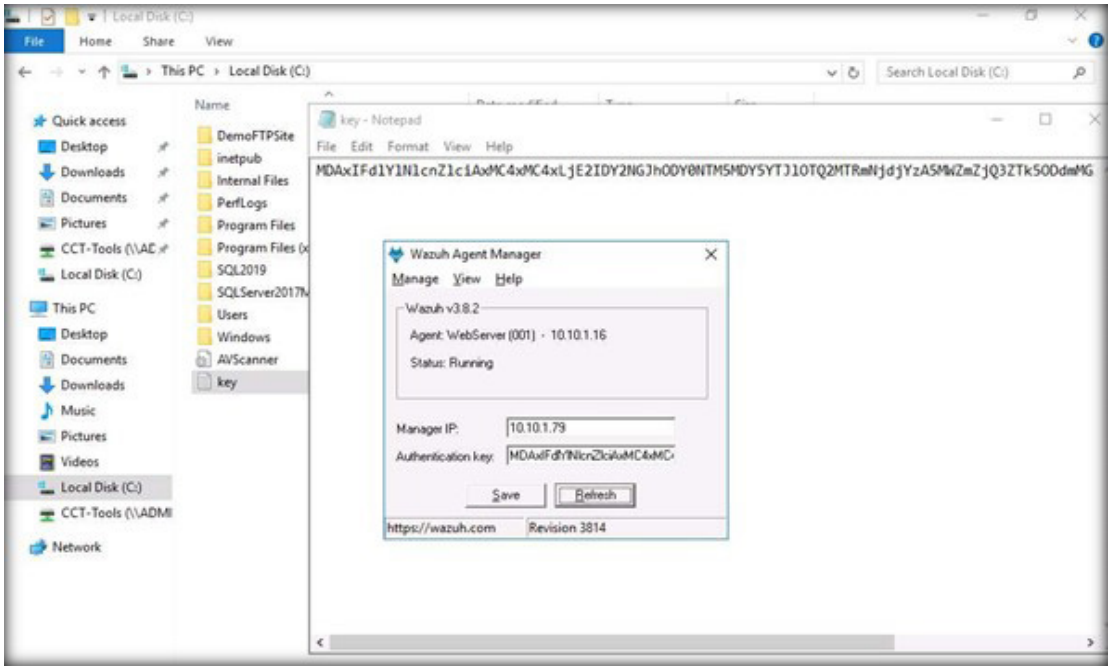
25. Click **OK** to confirm the importing key.

26. Manager IP will be added. By default, the Wazuh agent manager will be **stopped**. Select **Manage > Start** from the main menu and click **OK** for the prompted message.

EXERCISE 5:
IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS



27. Click **Refresh** to view the **Running** status of the agent.



EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

28. Switch back to the **Admin Machine-2** virtual machine, login with password **admin@123**.

29. Open terminal in root privileges using **sudo su** command and type **/var/ossec/bin/ossec-control restart**, press **Enter**.

EXERCISE 5:
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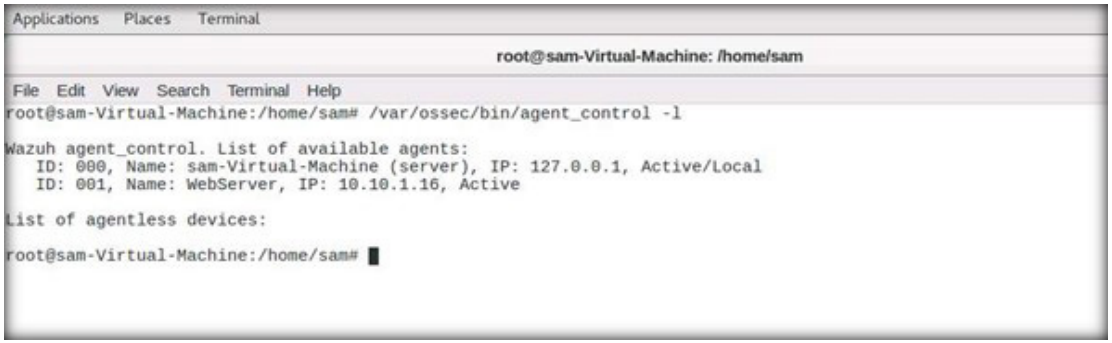
30. To check whether the agent is active, type **/var/ossec/bin/agent_control -l** and press **Enter**. You will see the **WebServer** agent that we added as Active.

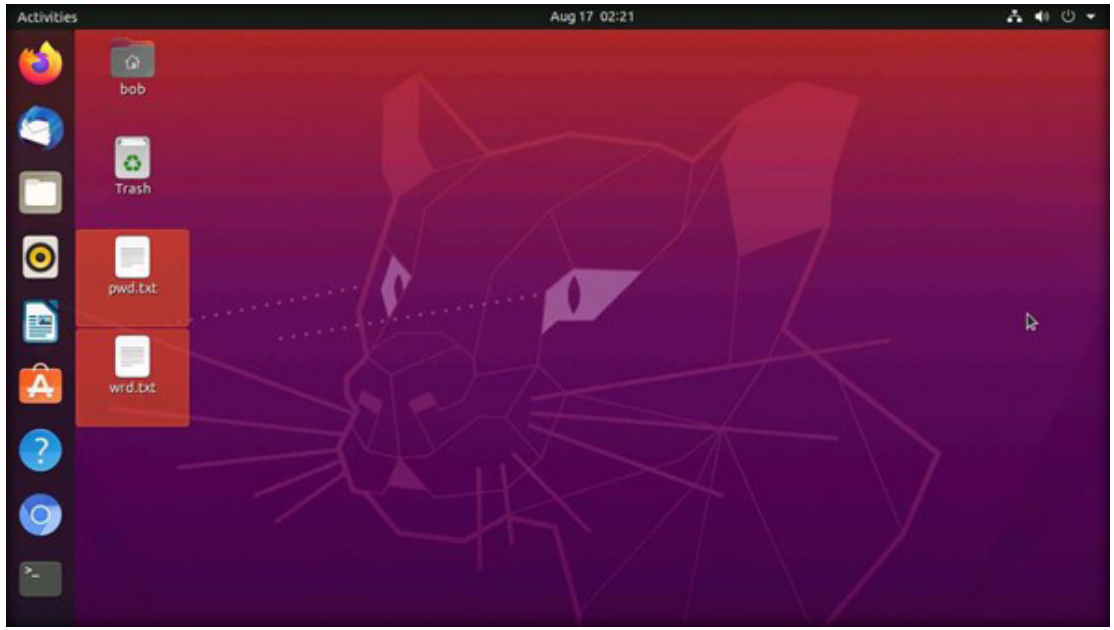


EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

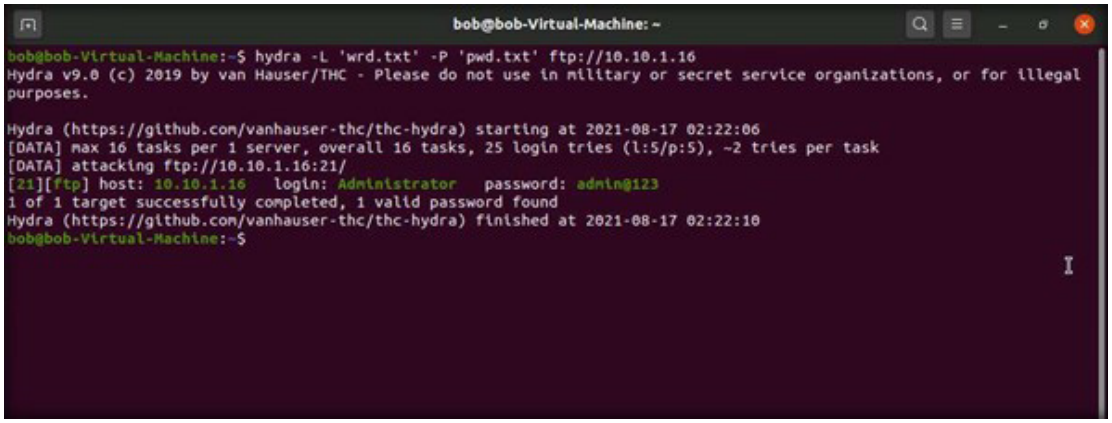
31. Switch to the **Attacker Machine-1** virtual machine, select username as **Bob** and type password as **user@123**, press **Enter**.

32. Copy the **wrd.txt** file and **pwd.txt** file from the home directory (**bob**) and paste on the **Desktop**.

EXERCISE 5:
IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS



33. Launch the **terminal** and type the below command to perform FTP attack on **Web Server**.
    hydra -L 'wrd.txt' -P 'pwd.txt' ftp://10.10.1.16



EXERCISE 5:
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Note: Re-execute the command if you don't get the result showed in the above screenshot.

34. This indicates that the attacker can extract the FTP username and password over the network using insecure ports.

35. Switch to the **Admin Machine-2** machine. Login with password **admin@123**.

36. Launch the **sguil** application from the desktop.

37. The Sguil window appears. Type the username as **martin** and password as **user@123**. Click the **OK** button.

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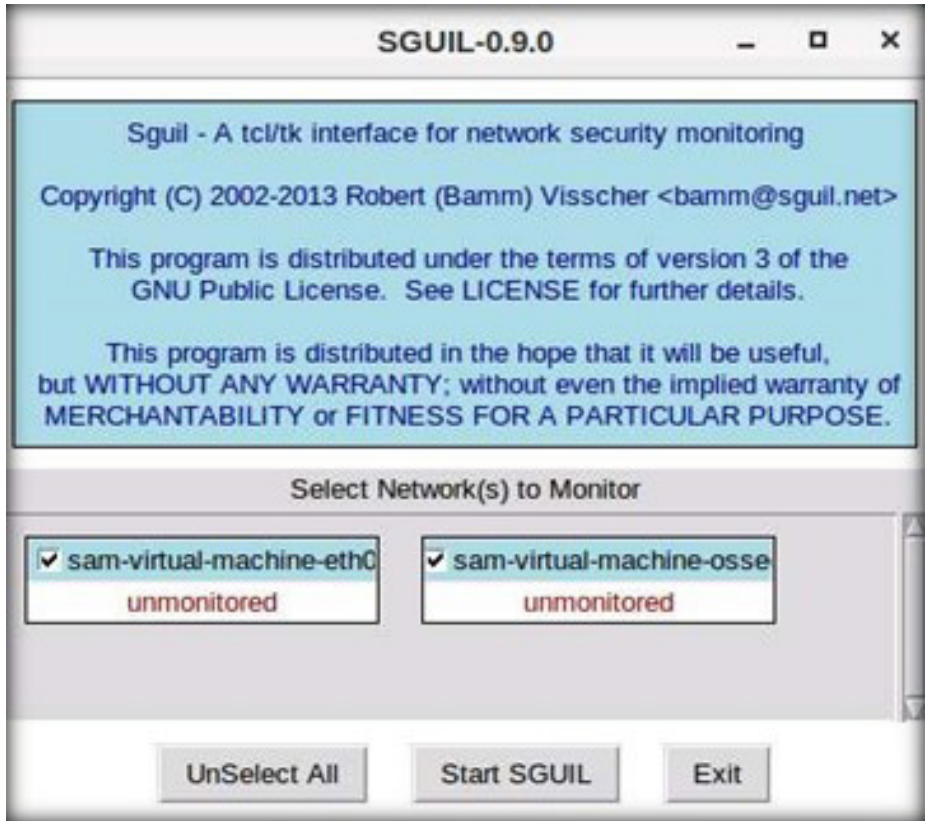
38. Network interfaces will be displayed. Click the **Select All** button.

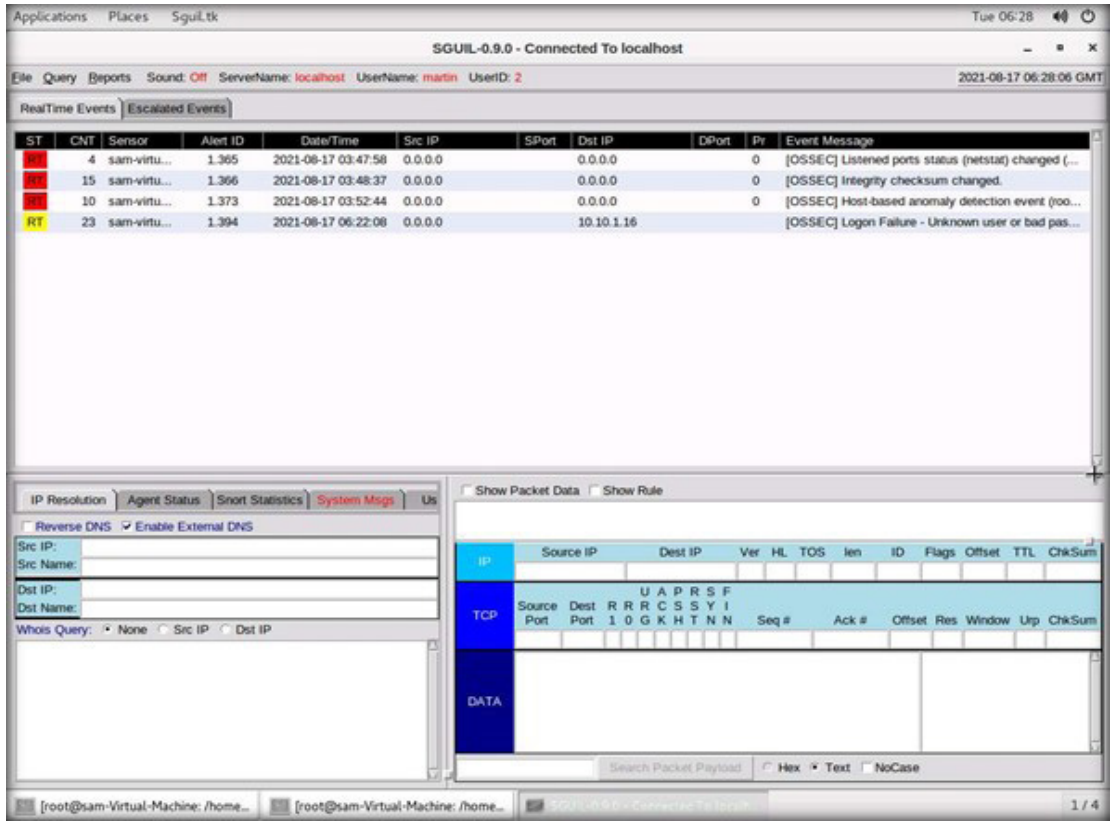
EXERCISE 5:
IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS



39. All available interfaces will be selected. Click the **Start SGUIL** button.

40. You will see the Sguil window, as shown in the screenshot below.

EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS

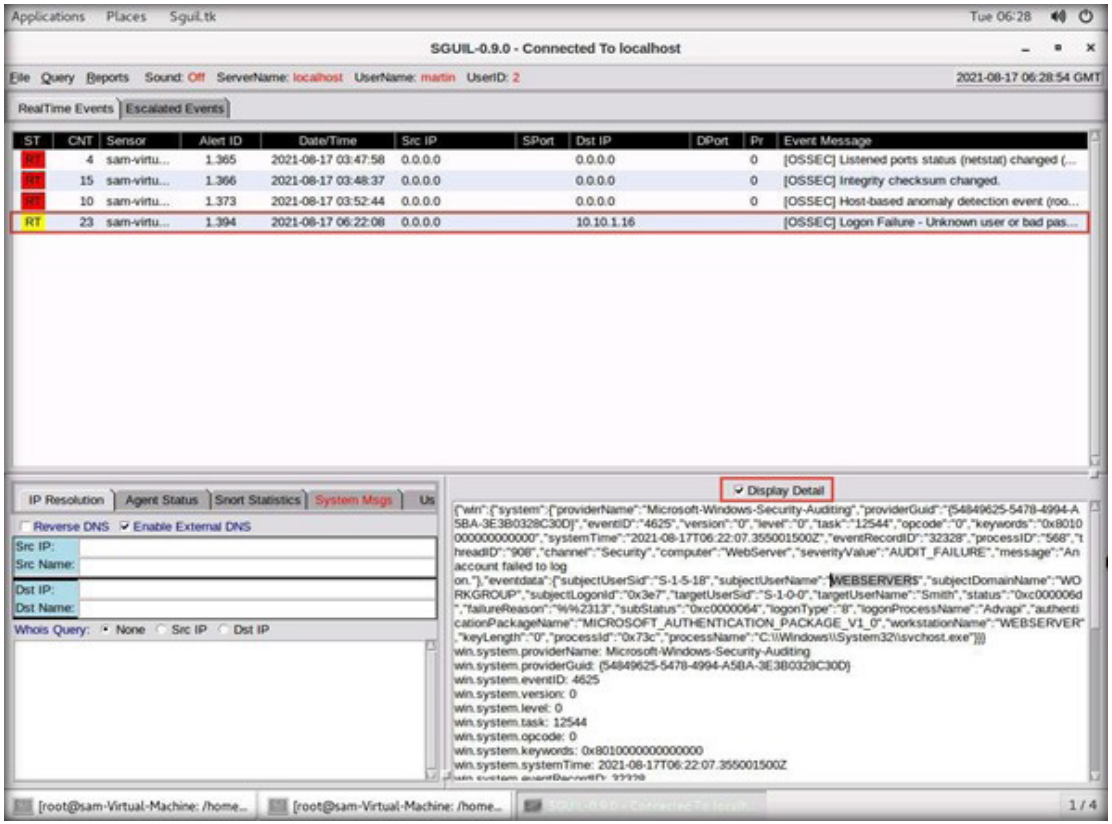


41. The Windows Login Failure event is captured by the Wazuh agent.

42. You can observe the **Dst IP 10.10.1.16** OSSEC alert.

43. Click on the **OSSEC** Windows: **Logon Failure–unknown user record** from the list and check the **Display Detail** pane/option.

EXERCISE 5: IMPLEMENT HOST-BASED IDS FUNCTIONALITY USING WAZUH HIDS



44. As described above, a security professional can use Wazuh to detect malicious activity on the host machine.

45. Close all open windows.

46. Turn off the **Admin Machine-2** virtual machine.

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

Network-based intrusion detection systems (NIDS) check every packet entering the network for the presence of anomalies and incorrect data.

LAB SCENARIO

A security professional must have the required knowledge to use Suricata for real-time Intrusion Detection System (IDS), inline Intrusion Prevention System (IPS), Network Security Monitoring (NSM), and offline pcap processing.

LAB OBJECTIVE

This lab will demonstrate how to use Suricata IDS. In this lab, you will also learn how to:

- Use the intrusion detection tool Suricata
- Review information in the Suricata Logs.

OVERVIEW OF NETWORK-BASED IDS

By limiting the firewall to drop large numbers of data packets, the NIDS checks every packet thoroughly. A NIDS captures and inspects all traffic. It generates alerts at the IP or application level based on the content. NIDS are more distributed than host-based IDS. The NIDS identifies the anomalies at the router and host levels. It audits the information contained in the data packets and logs the information of malicious packets; furthermore, it assigns a threat level to each risk after receiving the data packets.

LAB TASKS

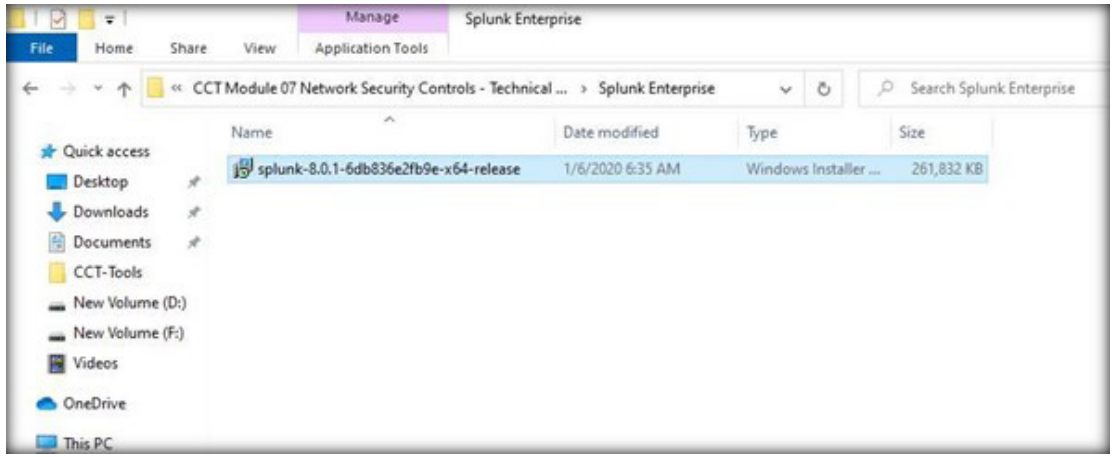
Note: Ensure that **Admin Machine-1, Web Server, Attacker Machine-1** and **PfSense Firewall** virtual machines are running.

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

1. Switch to the **Admin Machine-1** virtual machine.
   Note: If you are not logged into the machine, then log in using credentials **Admin** and **admin@123**.

2. Next, install Splunk Enterprise SIEM, to view the captured Suricata logs in SIEM.

3. Navigate to **Z:\CCT-Tools\CCT Module 07 Network Security Controls - Technical Controls\Splunk Enterprise**.



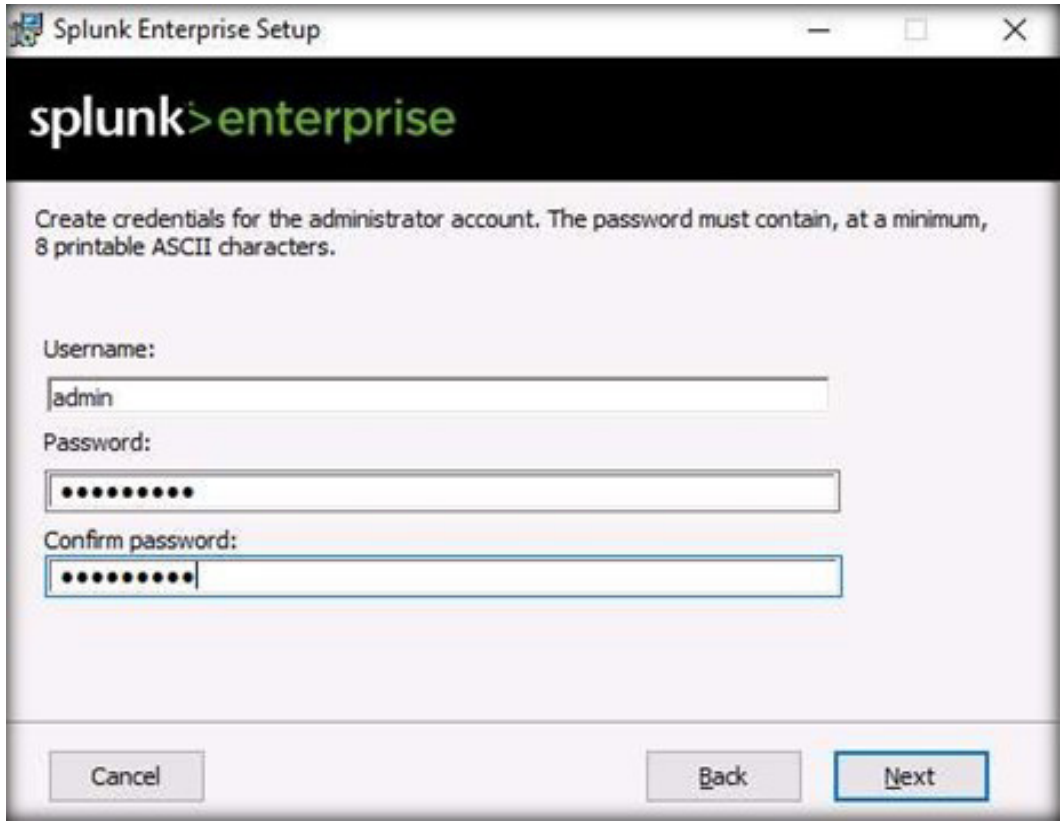
4. Double-click **splunk-8.0.1-6db836e2fb9e-x64-release.msi** to start the installation. If the **Open File - Security Warning** pop-up appears, click **Run**.

Note: If a "SmartScreen has prevented the app from running" message appears, click **More info**, and then click **Run anyway**.

5. The **Splunk Enterprise Installer** window appears. Click checkbox to accept the license agreement and click **Next**.

6. Enter the credential for Splunk Enterprise with username **admin**, password and confirm password as **admin@123**. Click **Next**.

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

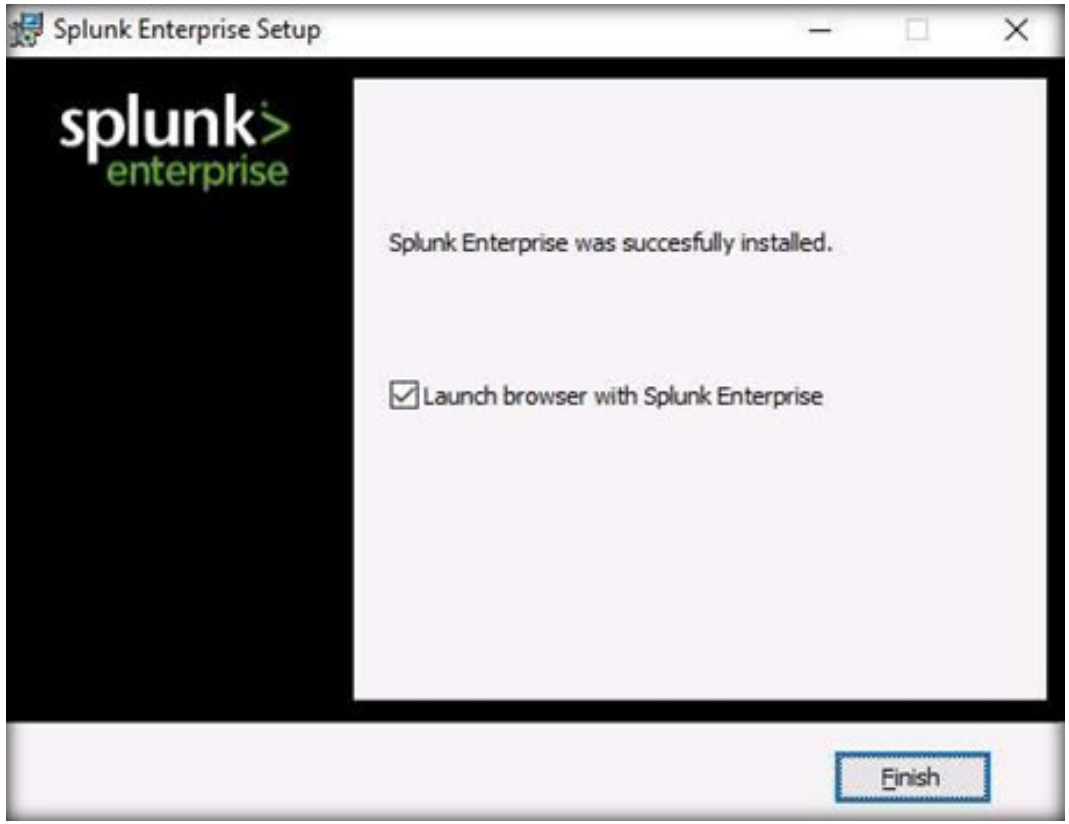


7. Click **Install** to install Splunk Enterprise.

8. The **User Account Control** pop-up window appears; click **Yes** to continue.

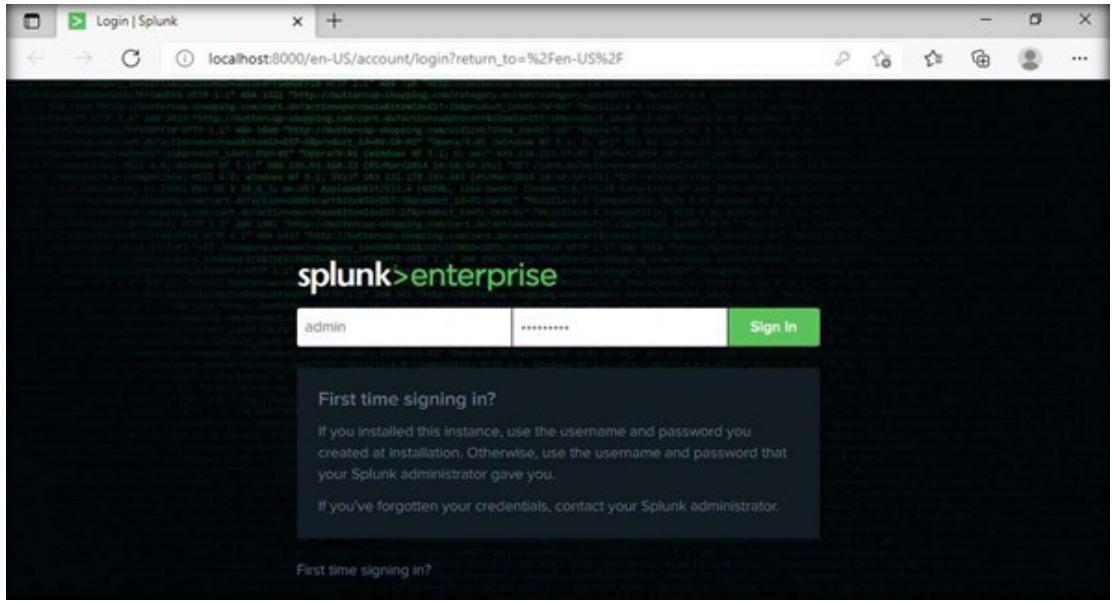
9. Wait for the installation to complete. Click **Finish** to complete the Splunk Enterprise setup.

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



10. Splunk Enterprise launches in your default browser.

11. The **First time signing in?** page appears. Enter the username (**admin**) and password (provided while installation as **admin@123**) in their respective fields and click **Sign In**.



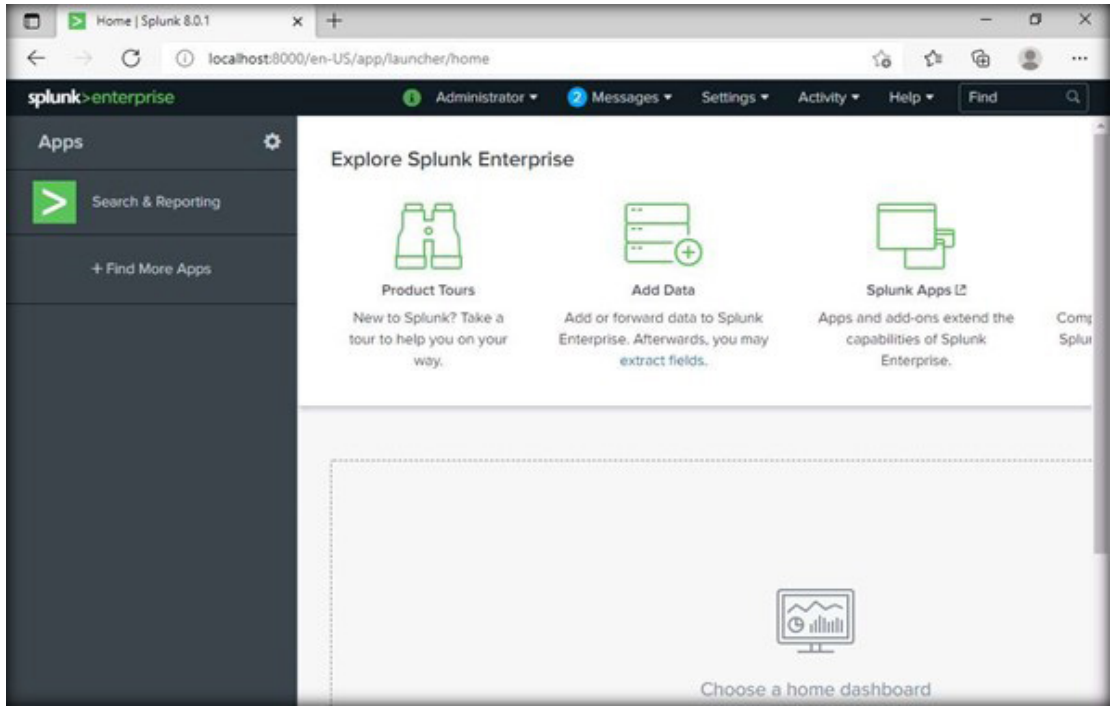
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

12. You will be successfully logged in to Splunk Enterprise.

    Note: **If Helping You Get More Value from Splunk Software** window appears, click on **Got it!**, in **Important changes coming!** window click on **Don't show me this again**.

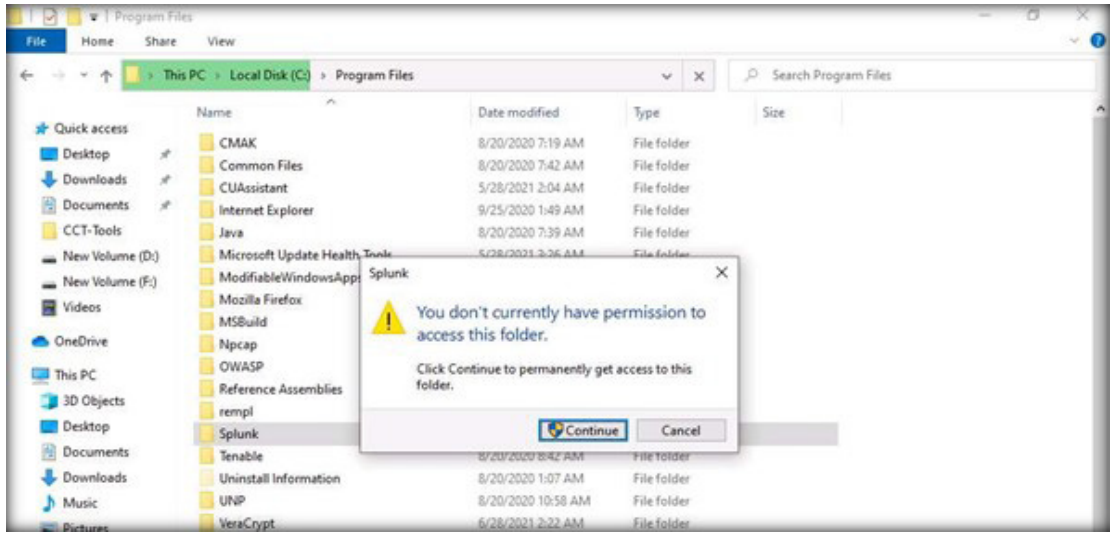
    Note: If **Save password** pop-up appears, click on **Never**.

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



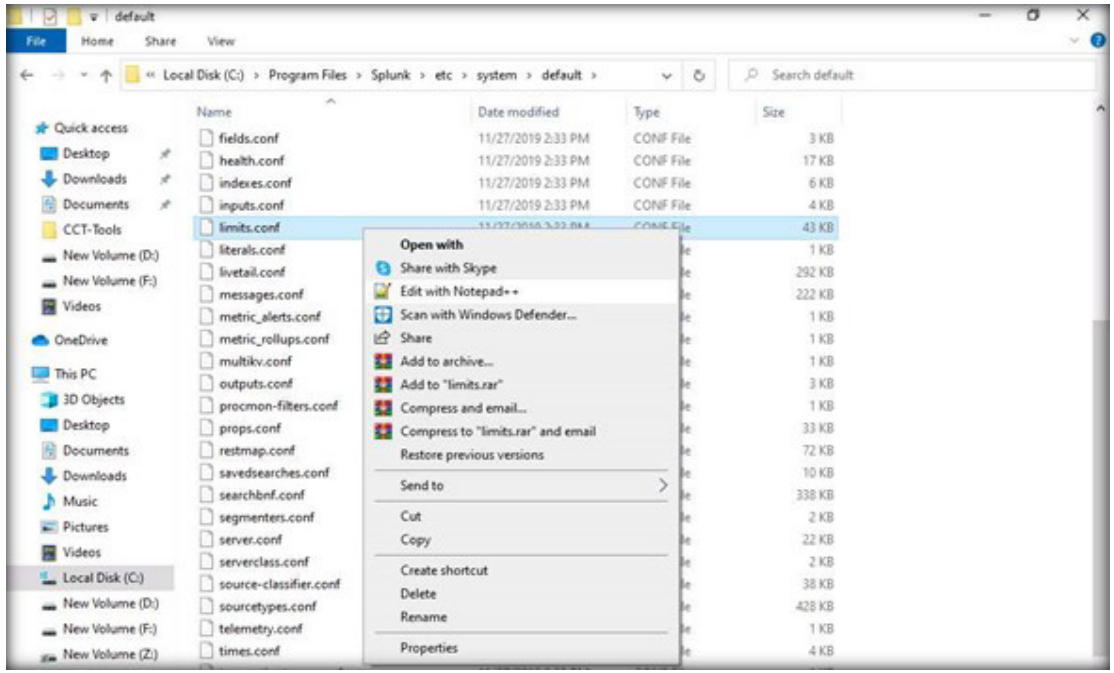
13. Close the browser, to increase the default maximum number of concurrent of searches per CUP in Splunk Enterprise, navigate to **C:\Program Files\Splunk\etc\system\default**.

14. If the permission alert window opens, click **Continue** to access the Splunk folder.



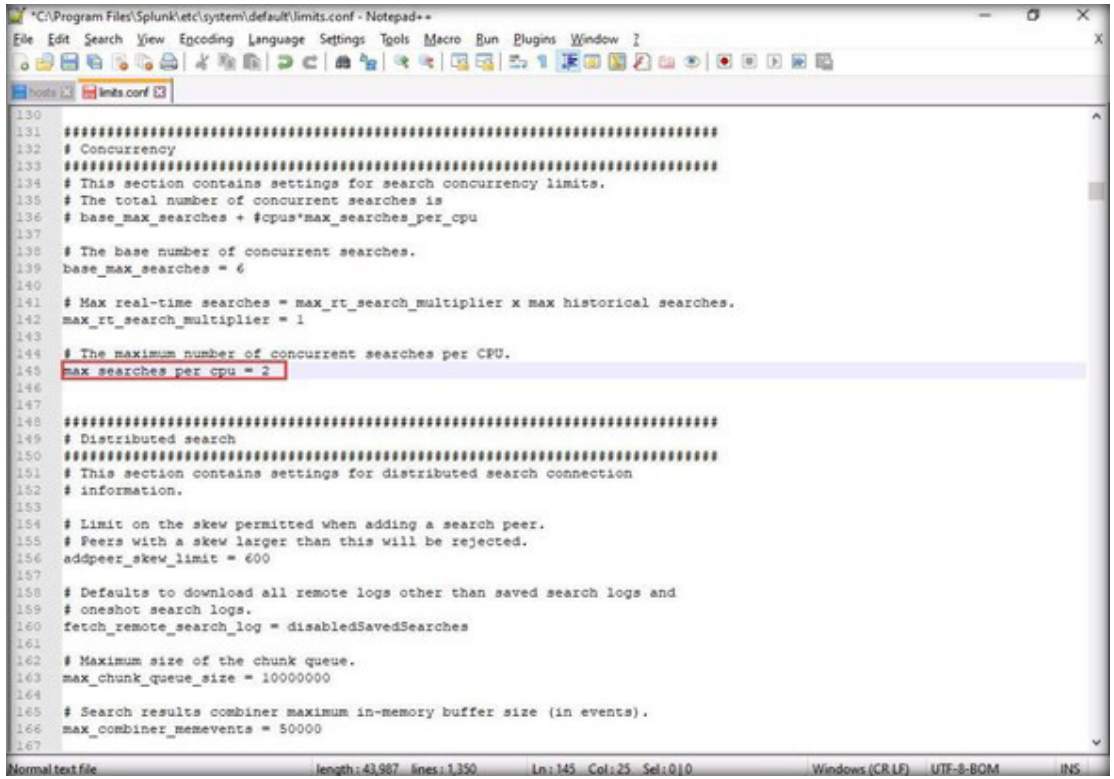
15. Open **limits.conf** with Notepad++.
    Note: If the **Notepad++ update** pop-up appears click **No**.

EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



16. Go to line number **145** and set **max_searches_per_cpu=2;** click save and close the file.

EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

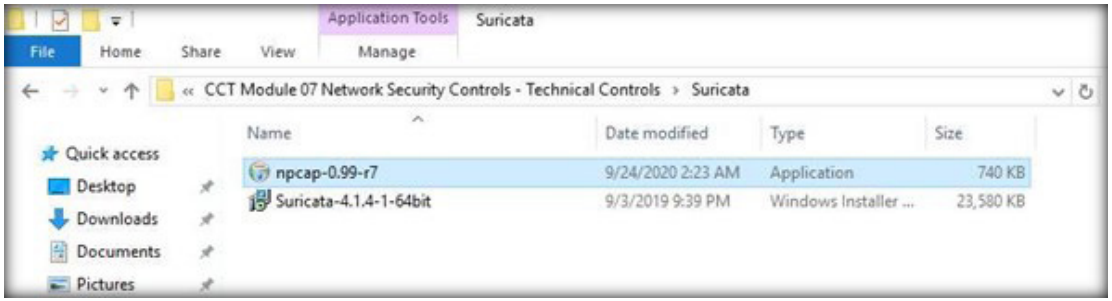


17. **Restart** the **Admin Machine-1** virtual machine.

18. The Suricata IDS configuration needs to be on the web server; therefore, we need to configure the Suricata IDS on Web Server.

19. Switch to the **Web Server** virtual machine.
    Note: If you are note logged into the machine, then log in using credentials **Administrator** and **admin@123**.

20. Navigate to **Z:\CCT Module 07 Network Security Controls - Technical Controls\Suricata** and copy **npcap-0.99-r7.exe**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

21. Paste the **npcap-0.99-r7.exe** file on the **Desktop**.

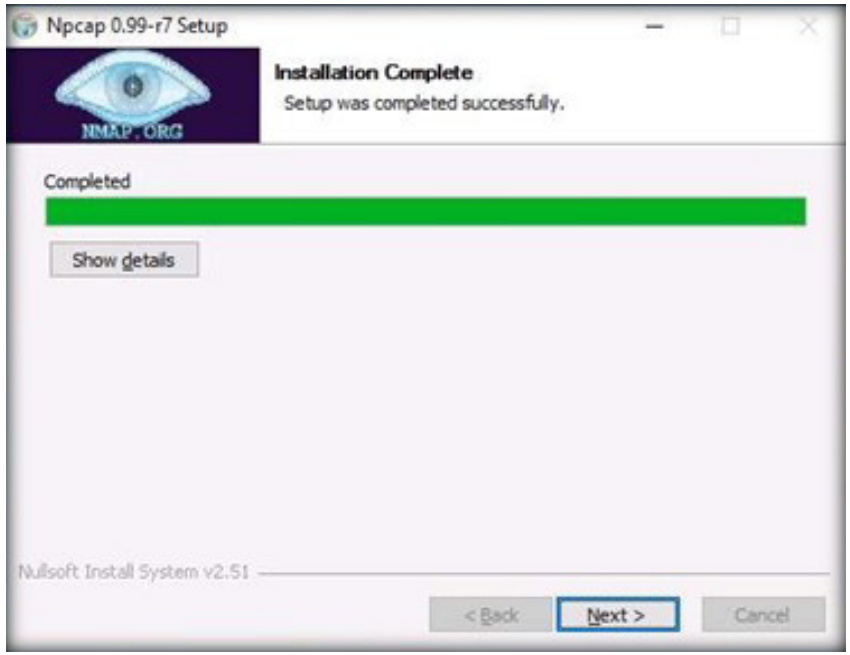
22. **Npcap** is a tool used for network packet capturing and injection library for Windows.

23. Suricata uses **npcap** for capturing network packets and alerts. The following steps demonstrate the installation of the npcap tool.

24. Double click on **npcap-0.99-r7.exe**. Click on **I Agree** to continue the installation.
    Note: If the **Security Warning** pop-up appears, click **Run**.

25. Check **Install Npcap in WinPcap API-compatible Mode** and click **Install**.

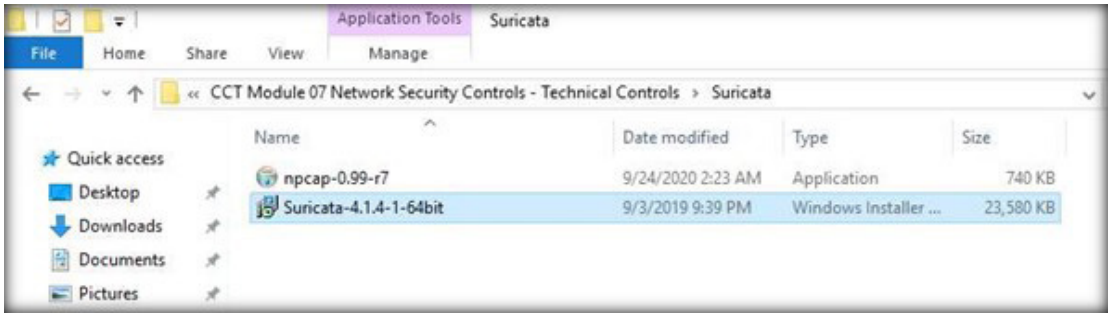
26. The installation will start in a few seconds. Once the installation is completed successfully, click **Next** to continue.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

27. Click **Finish** to complete the installation.

28. Navigate to **Z:\CCT-Tools\CCT Module 07 Network Security Controls - Technical Controls\Suricata** and copy **Suricata-4.1.4-1-64bit.msi**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

29. Paste the **Suricata-4.1.4-1-64bit.msi** file on the desktop.

30. Double click **Suricata-4.1.4-1-64bit.msi.** The **Suricata.IDS/IPS2.1.2-1-64bit Setup** window will appear. Click **Next**.

31. Check **I accept the terms in the License Agreement** to accept the license and click **Next**.

32. Click **Next** to continue the installation as shown in the screenshot below.

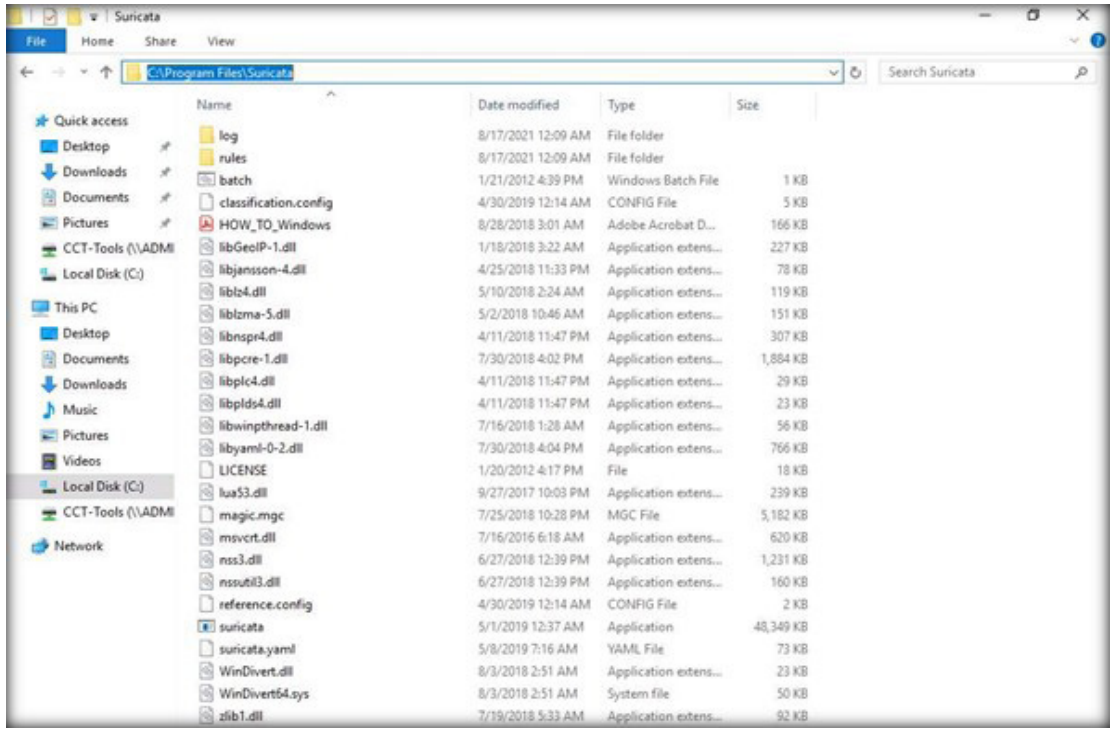
33. Click **Install** to continue the installation process.

34. Click **Finish** to complete the installation process.

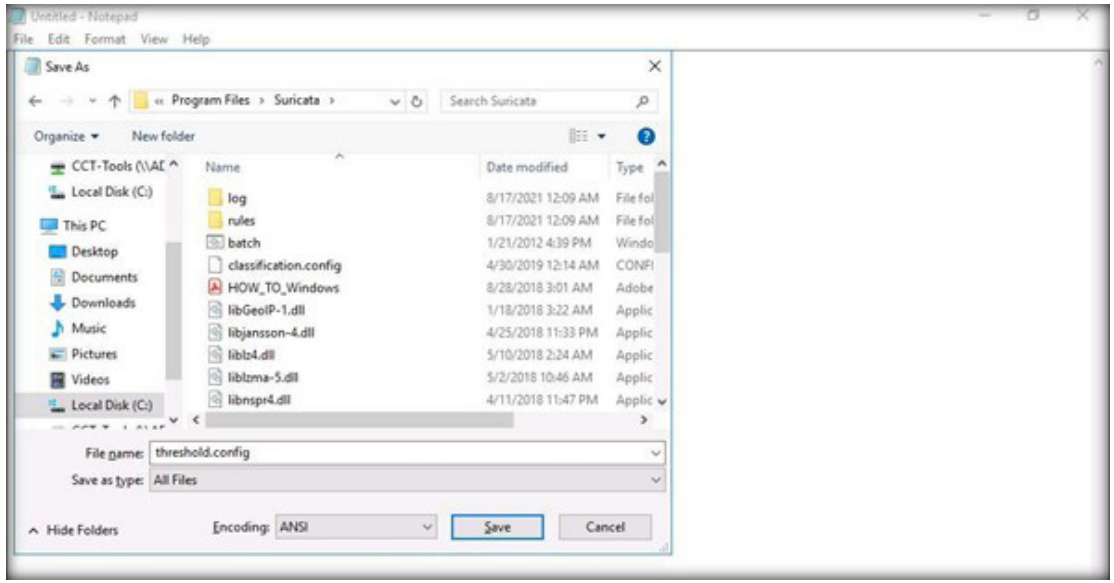
EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

35. After Suricata IDS is successfully installed, the Suricata directory will be created under the **C:\Program Files\Suricata**.

EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



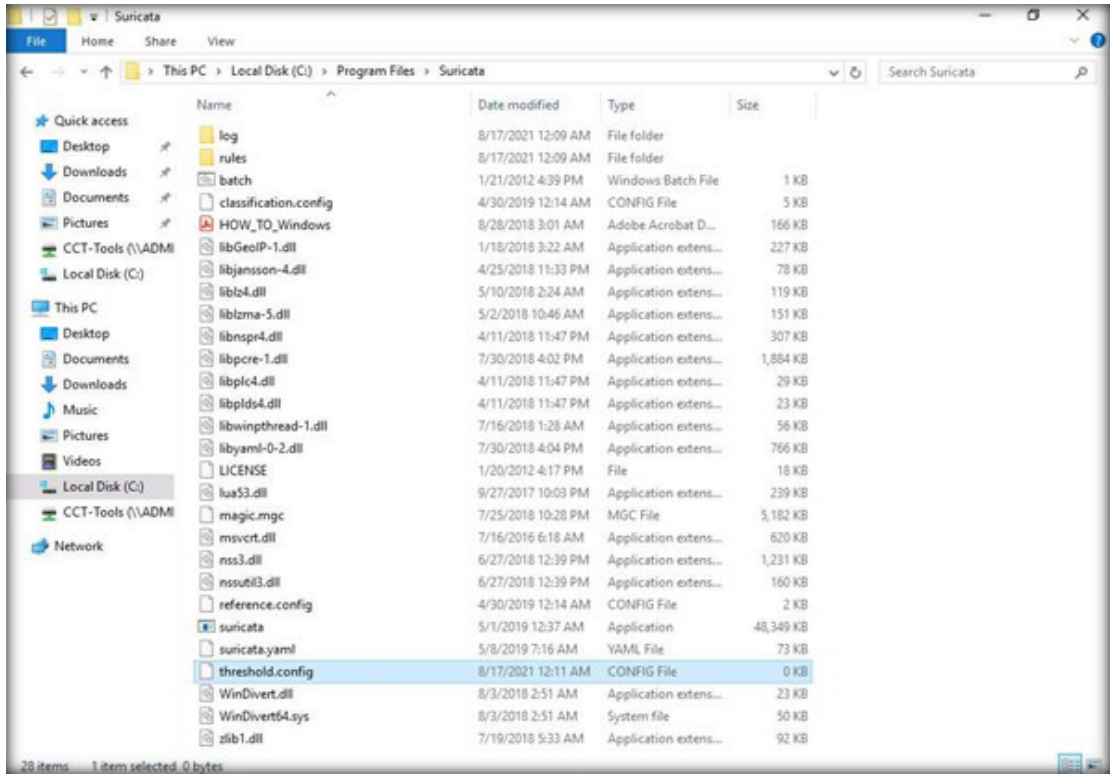
36. From Windows search, Open **Notepad** and save the empty **threshold.config** file under **C:\Program Files\Suricata** location, as shown in the screenshot below (ensure that you have selected **All Files** in the **Save as type:** option while saving the file).



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

37. The **threshold.config** file will be created, as shown in the screenshot below.

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



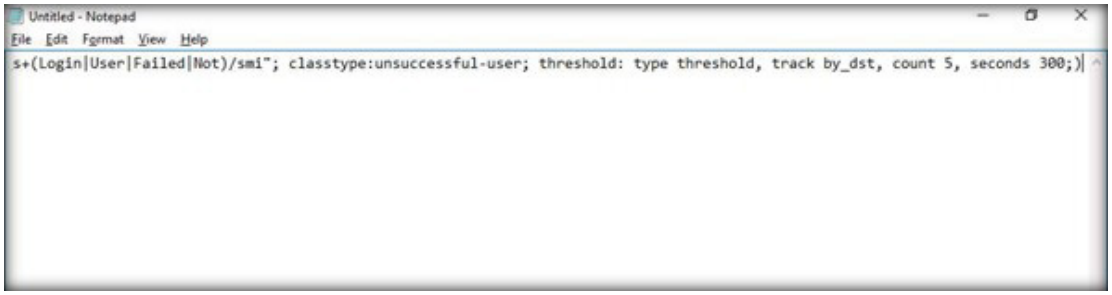
38. The Suricata IDS generates the alert based on the ruleset. A security professional can set the custom rule using the **.rule** file as shown in the following steps.

39. First, the **local.rules** file needs to be created. The **local.rules** file includes custom rules. We can create '**n**' number of files for various rules (the rule file must have a **.rule** extension).

40. Here, we have created a rule for generating a **PING** alert.

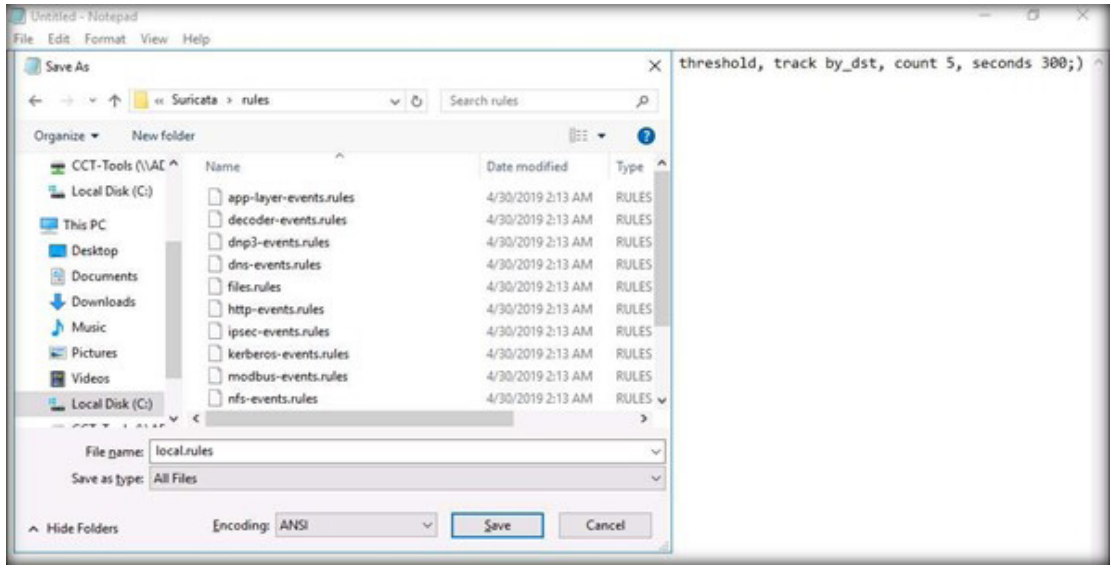
41. Open **Notepad**, and type the following:

alert tcp any 21 -> any (msg:"ET SCAN Potential FTP Brute-Force attempt"; flow:from_server,established; dsize:<100; content:"530 "; depth:4; pcre:"/530\s+(Login|User|Failed|Not)/smi"; classtype:unsuccessful-user; threshold: type threshold, track by_dst, count 5, seconds 300;)



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

42. Save the file as **local.rules** under the **C:\Program Files\Suricata\rules** location as shown in the screenshot below (ensure that you have selected **All Files** in the Save as type option while saving the file).



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

EXERCISE 6:
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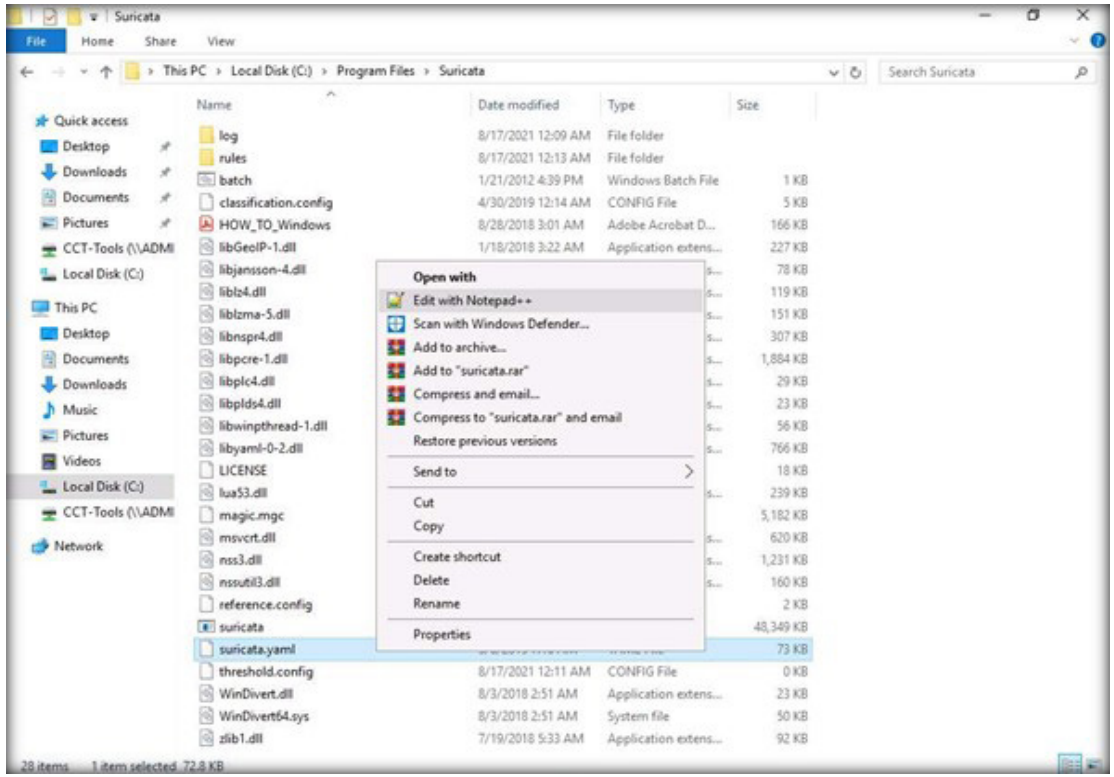
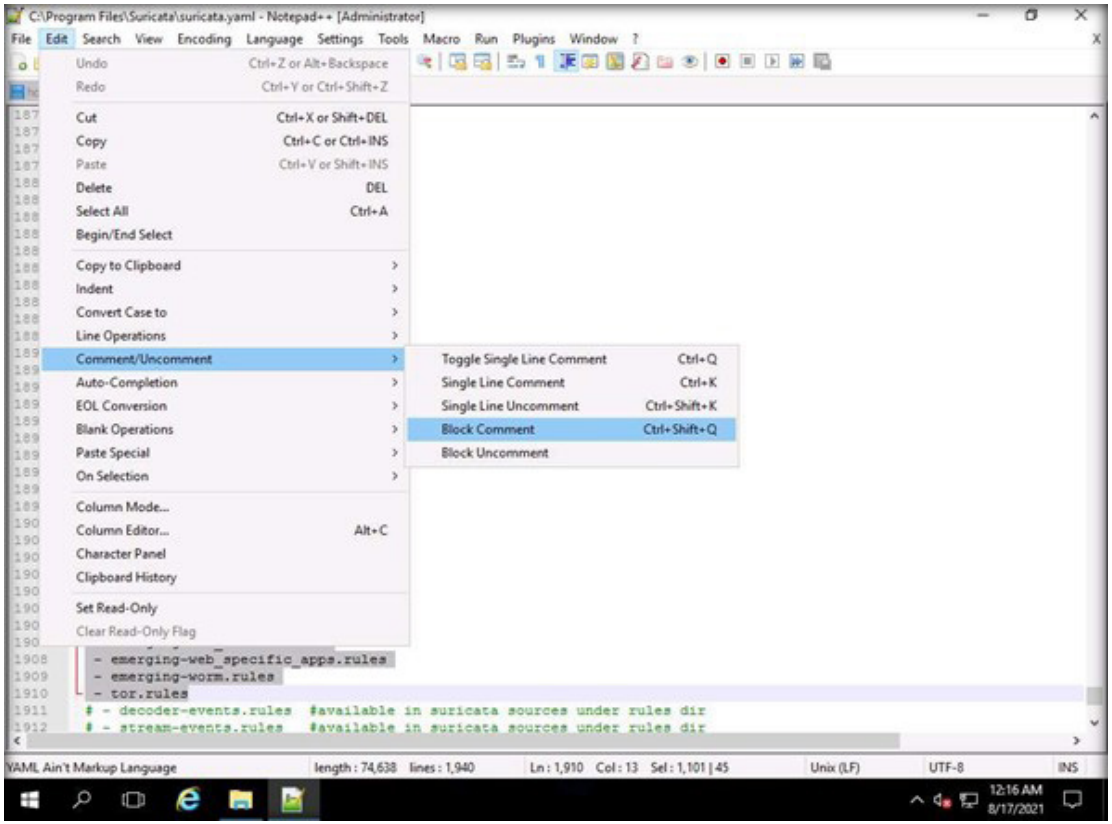
43. Navigate to **C:\Program Files\Suricata**, and open **suricata.yaml** file in Notepad++.



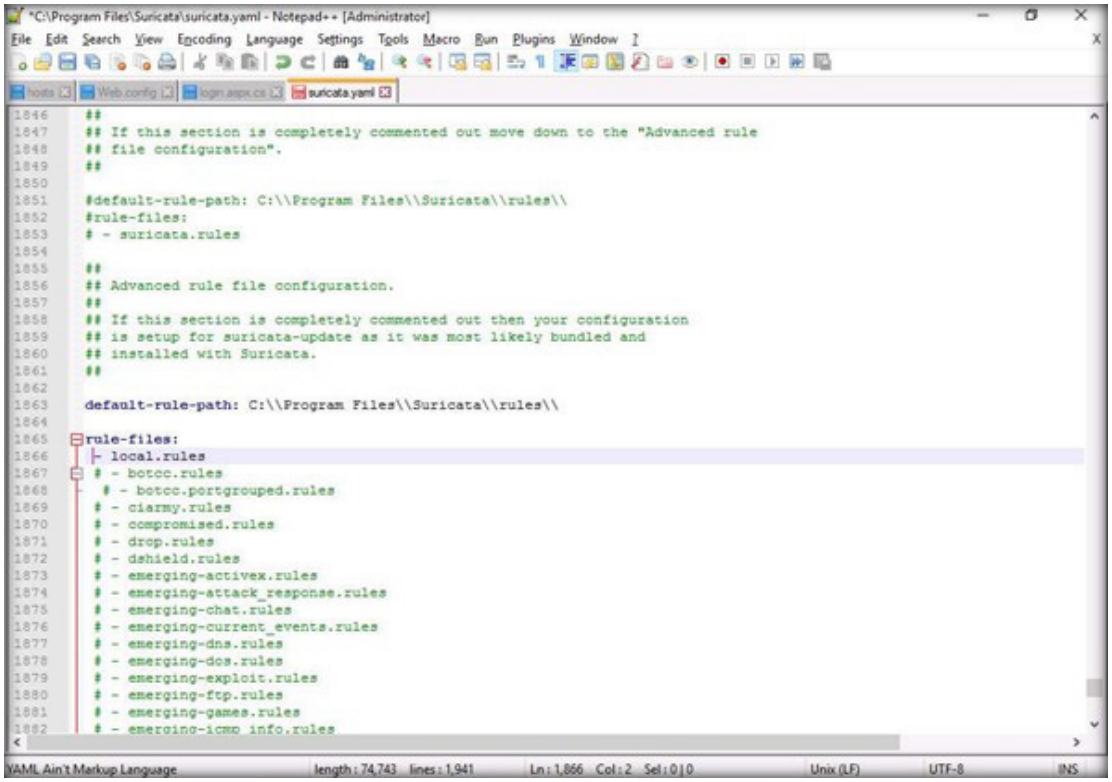
44. The **suricata.yaml** file opens in Notepad++.
    Note: If the Notepad++ update pop-up appears, click No.

45. To comment on the default rules files, select line numbers **1866** to **1910**, navigate to the **Edit** menu, and select **Comment/Uncomment > Block Comment** as shown in the screenshot below.

EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



46. Add – **local.rules** below the line number **1865** as shown in the screenshot below and click **Save**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

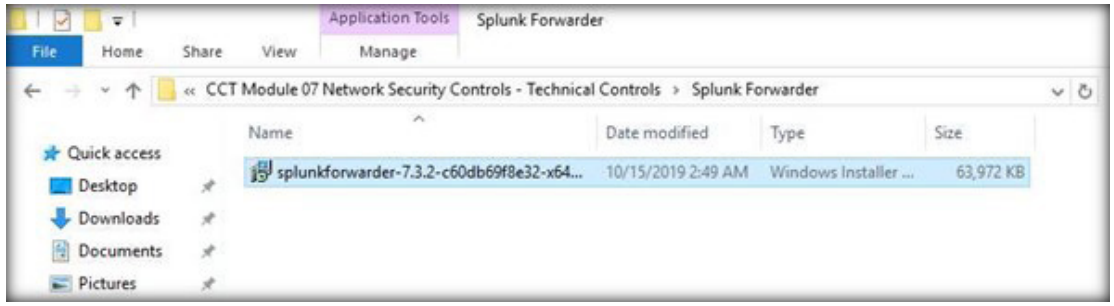
47. Close all open folders and files.

48. Navigate to **C:\Program Files\Suricata\log**. Observe that there is no log file under the **log\files** directory.

49. We will capture the Suricata logs in Splunk, next we forward Suricata logs to Splunk on the monitoring machine using Splunkforwarder.

50. To install Splunk forwarder, navigate to **Z:\CCT Module 07 Network Security Controls - Technical Controls\Splunk Forwarder**.

51. Double-click on **splunkforwarder-7.3.2-c60db69f8e32-x64-release.msi**.
    Note: If a **Security Warning** pop-up appears, click on **Run**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

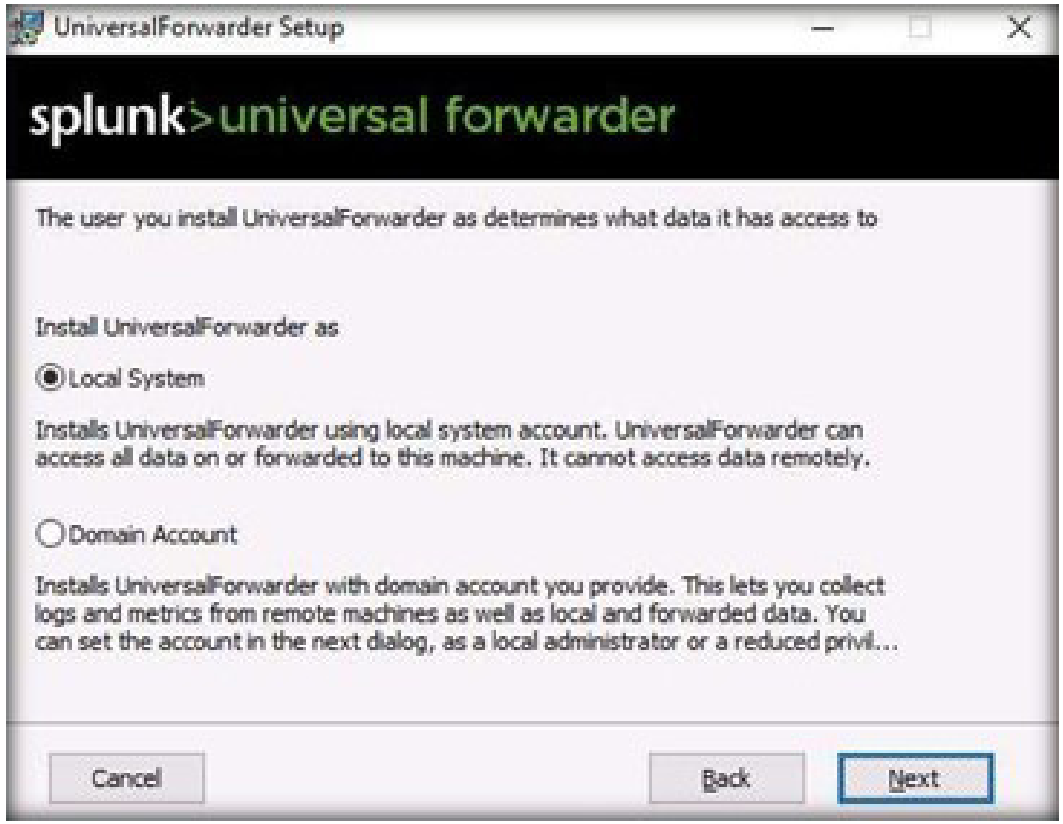
52. Once the UniversalForwarder Setup window appears, check **Check the box to accept the License Agreement** and click on **Customize Options**.

53. Leave the installation path set to the default location and click on **Next**.

54. Click on **Next** in the Splunk certificate section.

55. In the next step, select the Local System radio button to install Universal Forwarder as a **Local System** and then click on **Next**.

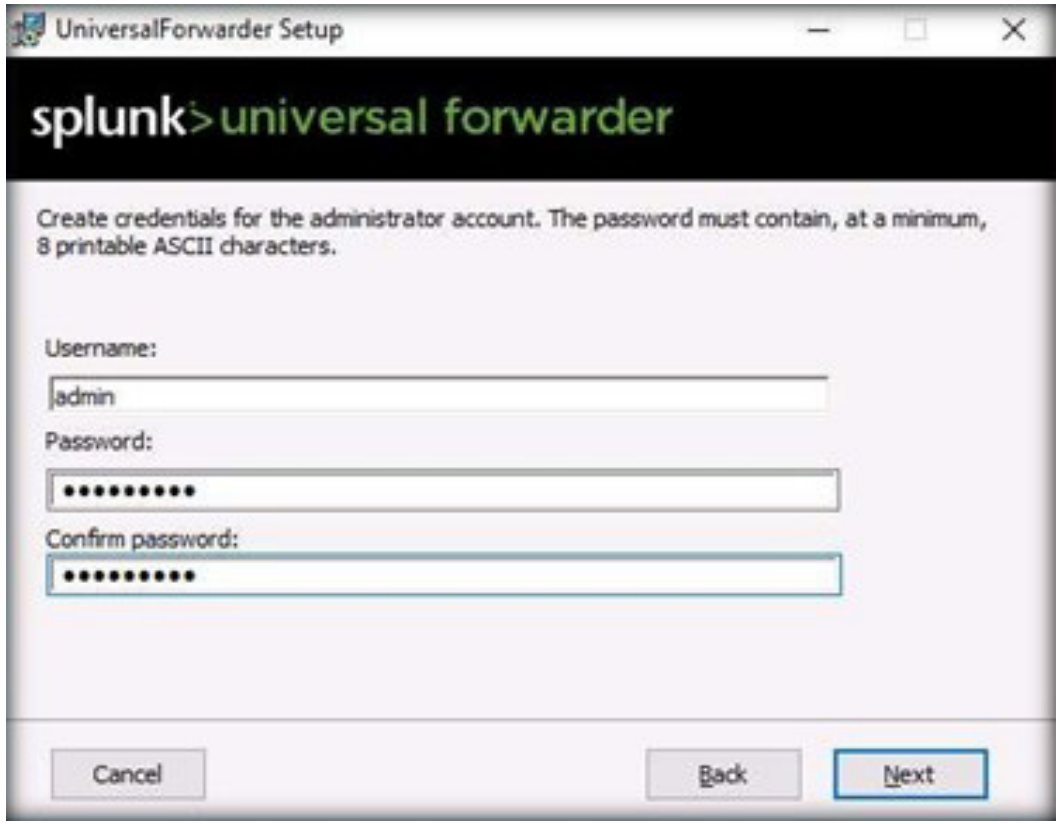
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



56. Next, check all entities under **Windows Event Logs, Active Directory Monitoring** and **Performance Monitor** and click on **Next**.

57. Create credentials for the administrator account; type username "**admin**" and password "**admin@123**" and click on **Next**.

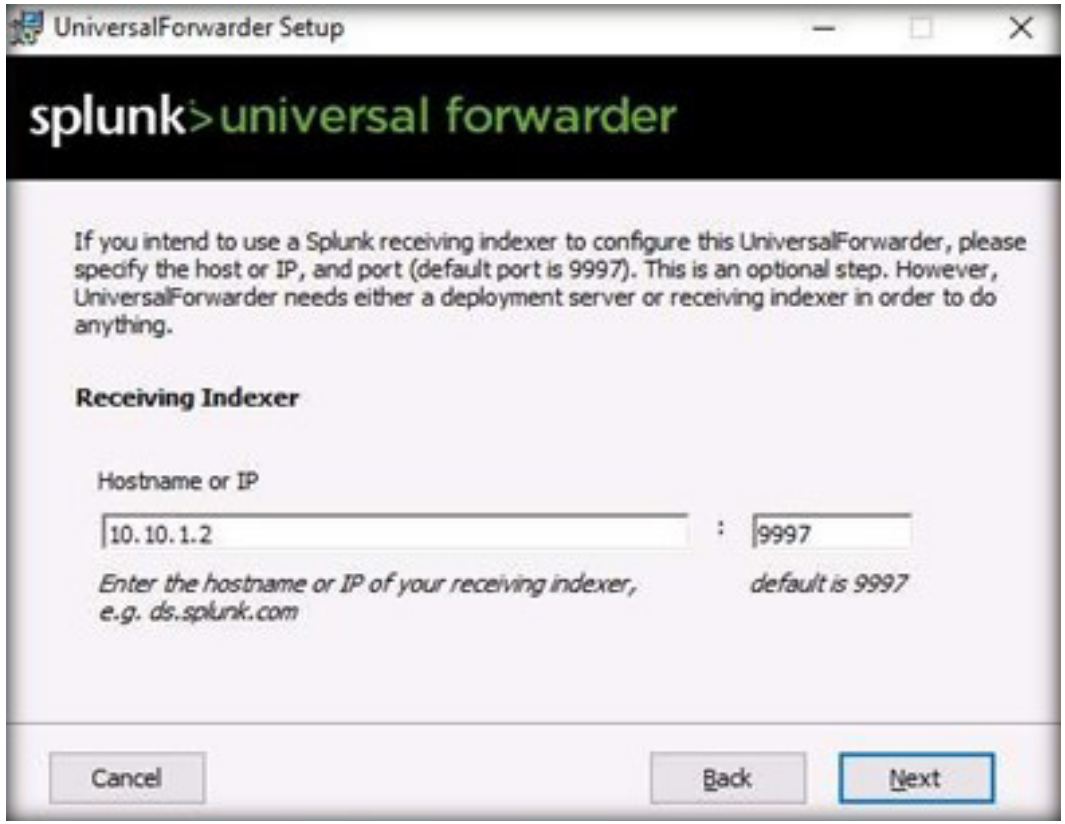
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



58. Leave the **Deployment Server** section without issuing the deployment IP and port number details and click on **Next**.

59. In the **Receiving Indexer** section, enter the IP address for **Admin Machine-1**, namely, **10.10.1.2** in the Hostname or IP field; enter Port **9997** in the port field and click on **Next**.

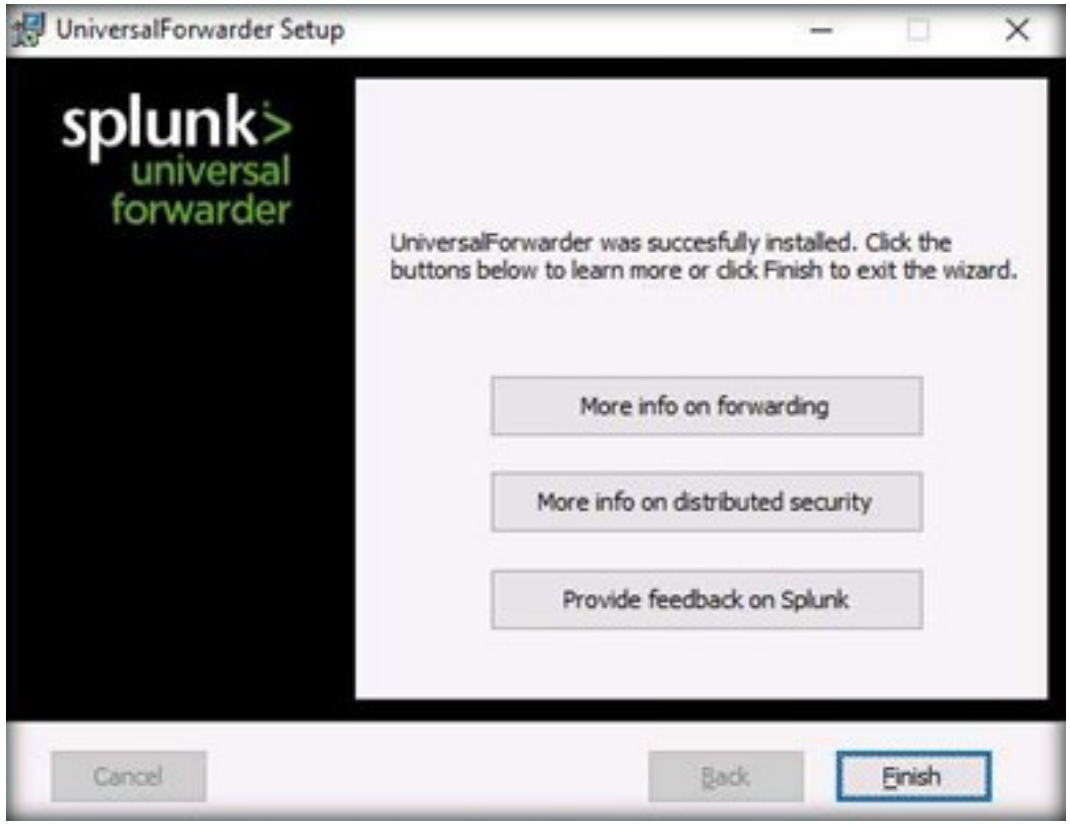
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



60. Once you are through with the configuration, click on Install. At this time, if a User **Account Control** pop-up appears, click on **Yes**.

61. Click on **Finish** after the installation completes.

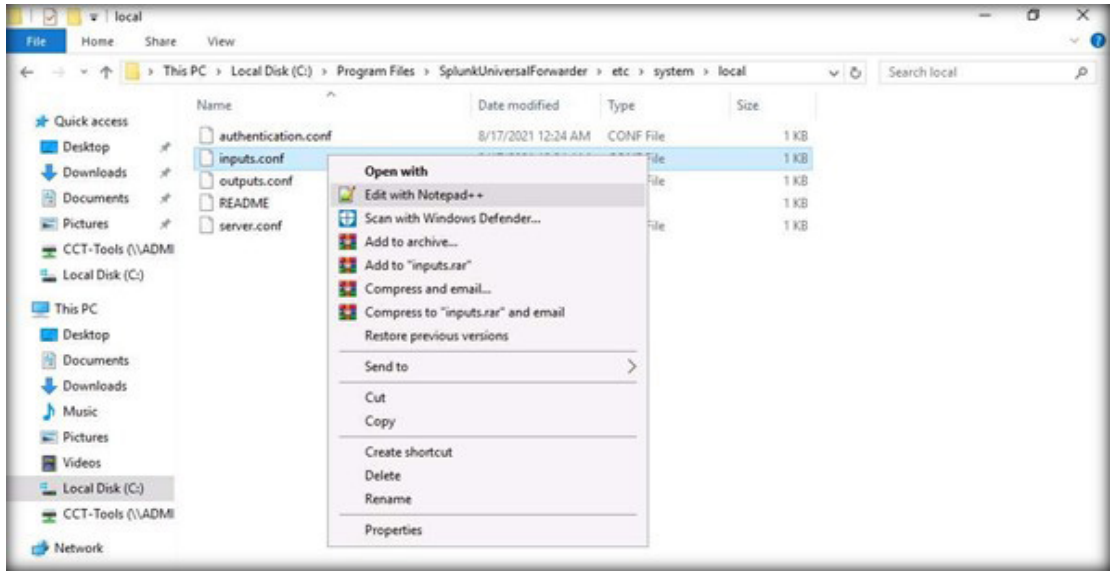
EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



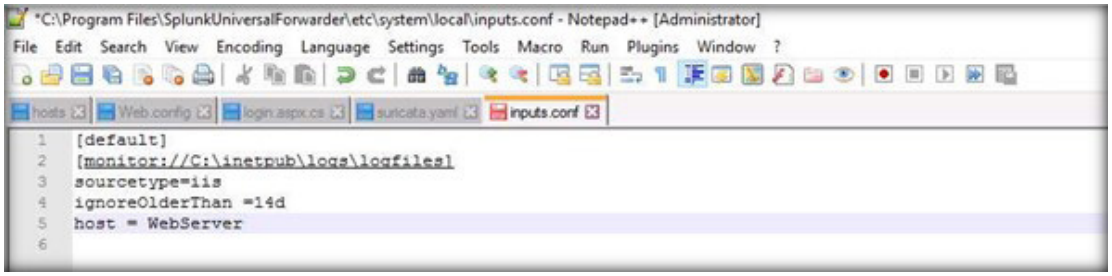
Note: You do not need any explicit configuration for **Splunk Forwarder** to collect Windows event logs, since Splunk Forwarder has default configuration done during installation. You need to configure Splunk Forwarder explicitly to collect logs from IIS and Snort IDS.

62. To configure Splunk Universal Forwarder to collect IIS logs from the Web Server machine, go to the Web Server machine.

63. Navigate to **C:\Program Files\SplunkUniversalForwarder\etc\system\local**, right-click on **inputs.conf**, and then on **Edit with Notepad++**.



64. Add the following lines in the **inputs.conf** file like in the below screenshot.
[monitor://C:\inetpub\logs\logfiles]
sourcetype=iis
ignoreOlderThan =14d
host = WebServer

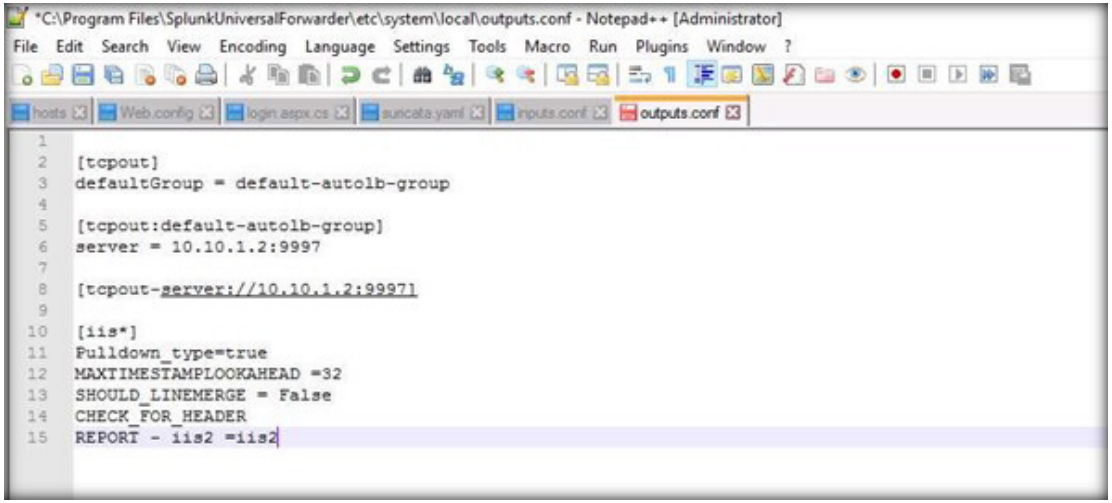


EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

65. Click on **Save** to save the file and close it.

66. Right-click on **outputs.conf**, and then on **Edit with Notepad++**.

67. Add the following lines in the **outputs.conf file**, as shown in the screenshot below.
[iis*]
Pulldown_type=true
MAXTIMESTAMPLOOKAHEAD =32
SHOULD_LINEMERGE = False
CHECK_FOR_HEADER
REPORT – iis2 =iis2



EXERCISE 6:
IMPLEMENT
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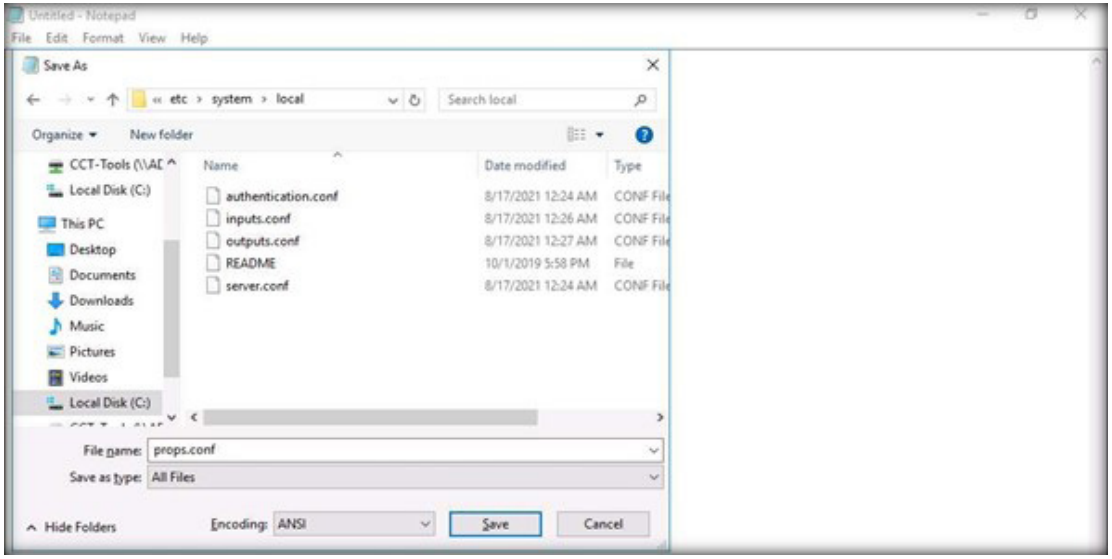
68. Click on **Save** to save the file and then **Close** it.

69. Open **Notepad** and type the below code.

```
[iis*]
Pulldown_type=true
MAXTIMESTAMPLOOKAHEAD =32
SHOULD_LINEMERGE =False
CHECK_FOR_HEADER
REPORT -iis2 =iis2
```

70. **Save** the notepad as **props.conf** at **C:\Program Files\SplunkUniversalForwarder\etc\system\local** path and close the file.

Note: Ensure you have selected **Save type as: All Files** while saving the props.conf file.



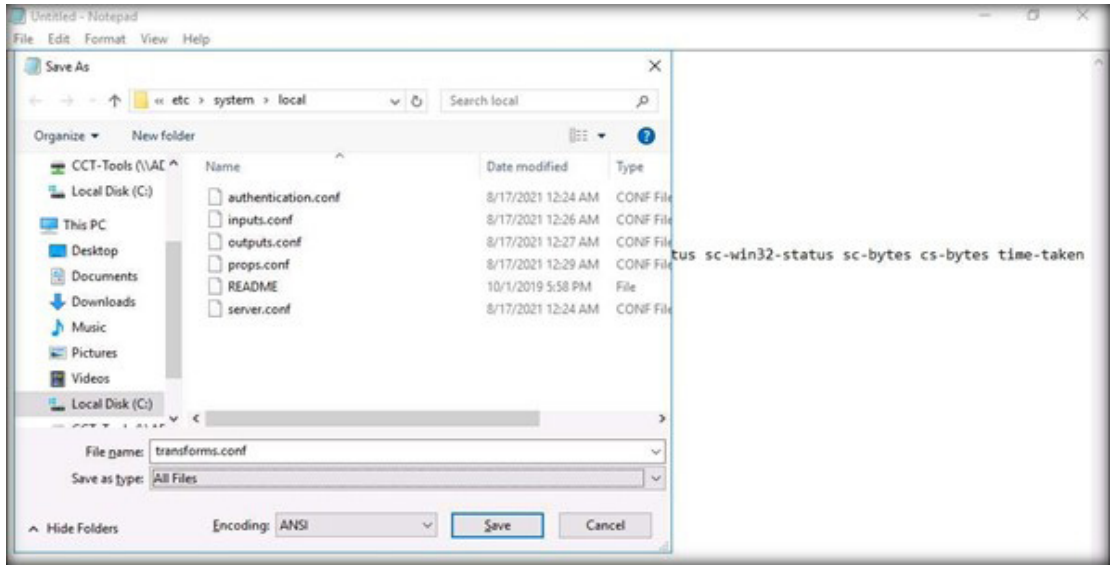
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

71. Open Notepad again, add the following lines in the new opened file and save the file as **transforms.conf** at **C:\Program Files\SplunkUniversalForwarder\etc\system\local**.

Note: Ensure you have selected **Save type as: All Files** while saving the transforms.conf file.

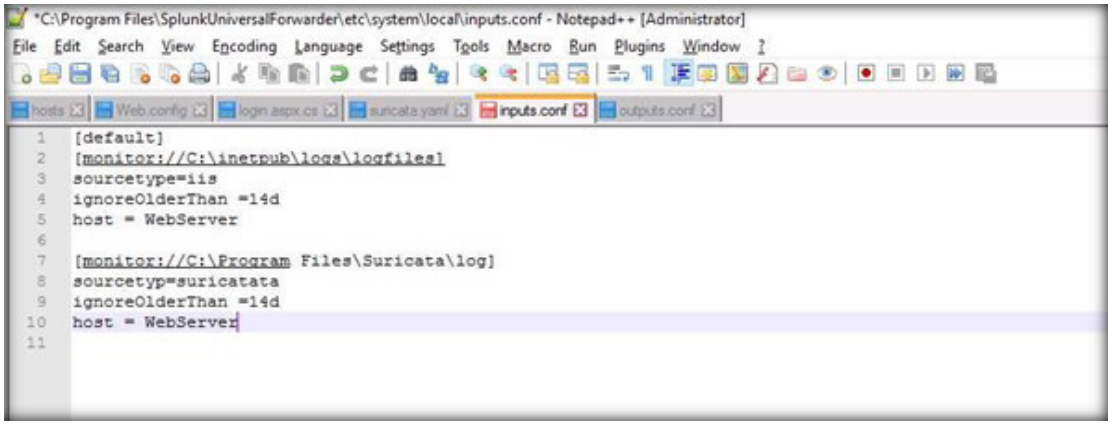
```
[default]
host -WebServer

[ignore_comments]
REGEX = ^#.*
DEST_KEY =queue
FORMAT =nullQueue

[iis2]
DELIMS =" "
FIELDS = date time s-ip cs-method cs-uri-stem cs-uri-query s-port cs-username c-ip cs(User-Agent) cs(Cookie) cs(Referer) cs-host sc-status sc-substatus sc-win32-status sc-bytes cs-bytes time-taken
```

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



72. To forward the Suricata logs, navigate to the **C:\Program Files\SplunkUniversalForwarder\etc\system\local** folder and open **inputs.conf** file **Edit with Notepad++**. Add the following configuration lines of code at the end of the file and **Save**. Close the file.

[monitor://C:\Program Files\Suricata\log]
sourcetyp=suricatata
ignoreOlderThan =14d
host = WebServer

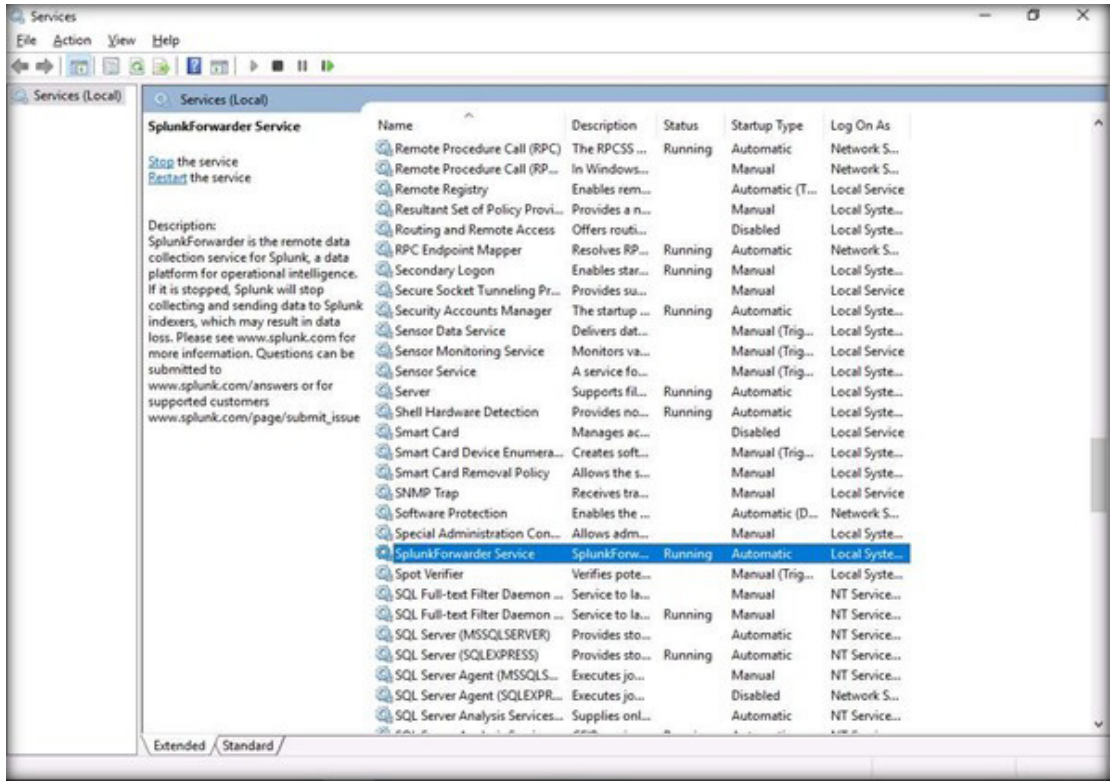


EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

73. Close all open files in **Notepad**.

74. Navigate to **Windows Start > Administrative Tools**. Double-click on **Services** in the Administrative Tools window. The services window opens, search for **SplunkForwarder Service**.

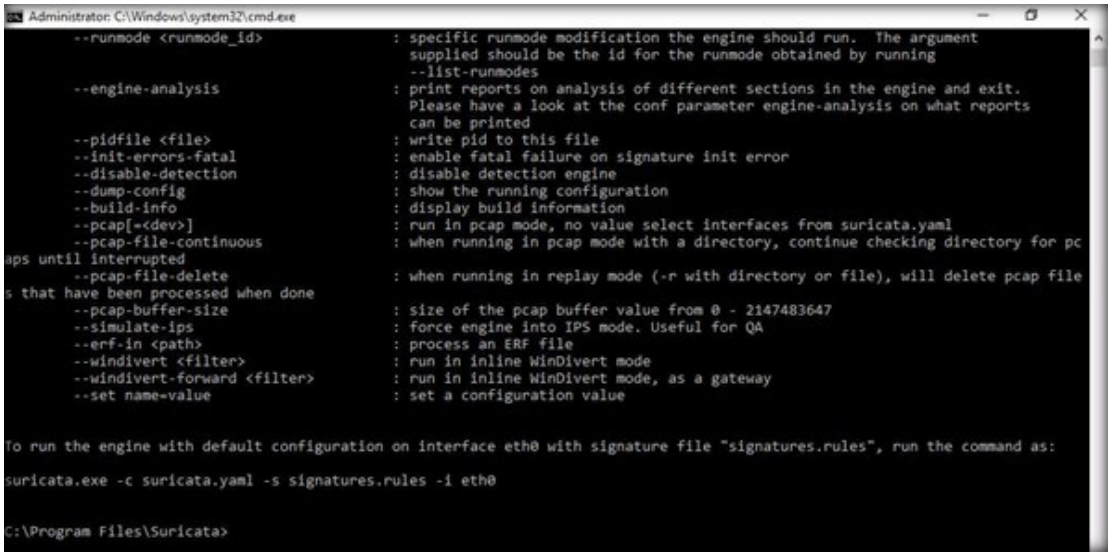
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



75. Click on **SplunkForwarder Service**, and then **Restart** the service.
    Note: If an error occurs while restarting, click **Start** again.

76. Next, launch Suricata to capture the network traffic, navigate to the desktop, and double click the **Suricata-4.1.4-64bit IDS-IPS** shortcut.

77. The Suricata Command Prompt will open.



78. Type the **suricata.exe -c suricata.yaml -i 10.10.1.16** command to run Suricata for capturing network traffic, and press **Enter**.

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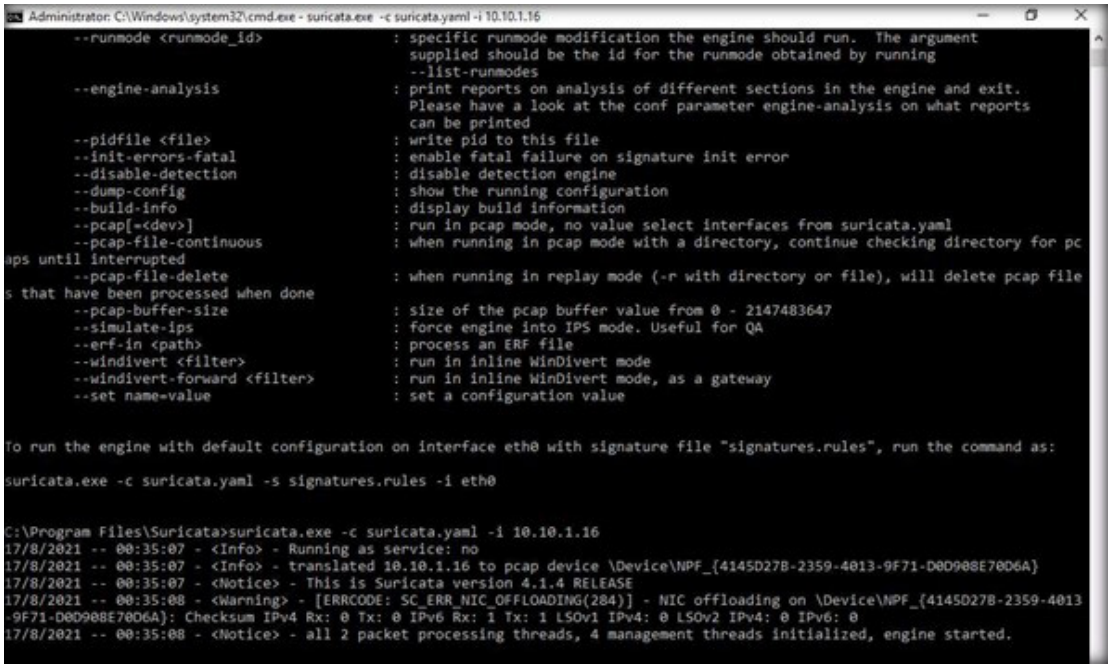


79. The Suricata engine will start. Leave the command prompt open and Suricata running.

80. We need to perform the attack from the attacker machine to the **Web Server**. Suricata will then generate the alert and store it in the **fast.log** file.

81. The **fast.log** file is the default alert log file that is already set into the suricatata.yaml file.

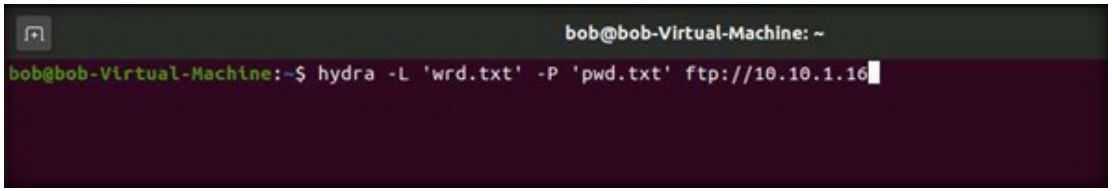
82. Switch to the **Attacker Machine-1** virtual machine.

83. Select username as **Bob** and type password as **user@123** and press **Enter**.

84. To perform a brute-force attack, use the tool Hydra from Ubuntu OS (Attacker Machine).

Note: Hydra uses two files for performing a brute-force attack. The first file has the list of usernames, and the second file has a list of passwords. Hydra uses these lists of usernames and passwords for performing a brute-force attacks.

85. Press **Ctrl + Alt + T** to open the terminal, type **hydra -L 'wrd.txt' -P 'pwd.txt' ftp://10.10.1.16**, and press **Enter**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

86. The **Attacker Machine-1** will try to match the combination of usernames and passwords with the Web Server.

87. The matched username and password are shown in the terminal in green color. Close the terminal window.

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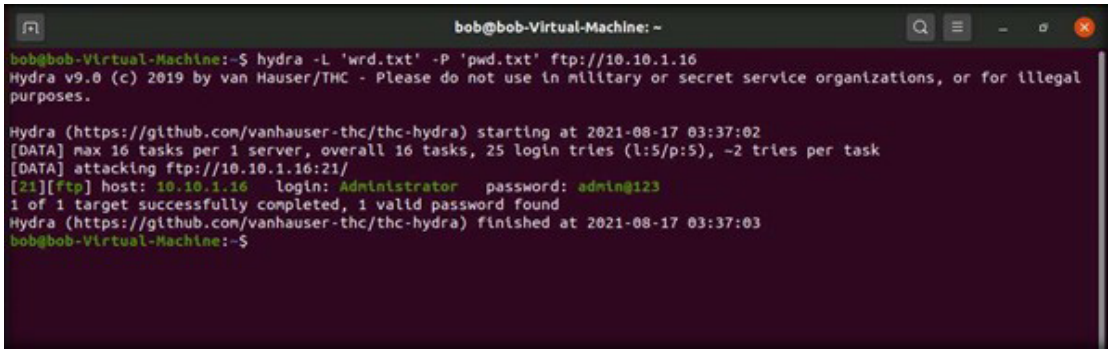


88. After the attack is complete, switch to the **Admin Machine-1** virtual machine.

89. Log in using the credentials **Admin** and **admin@123**.

    Note: If the network screen appears, click **Yes**.

90. Launch the web browser, and access Splunk Enterprise with the URL **http://localhost:8000/en-US/account/login?** and press **Enter**.

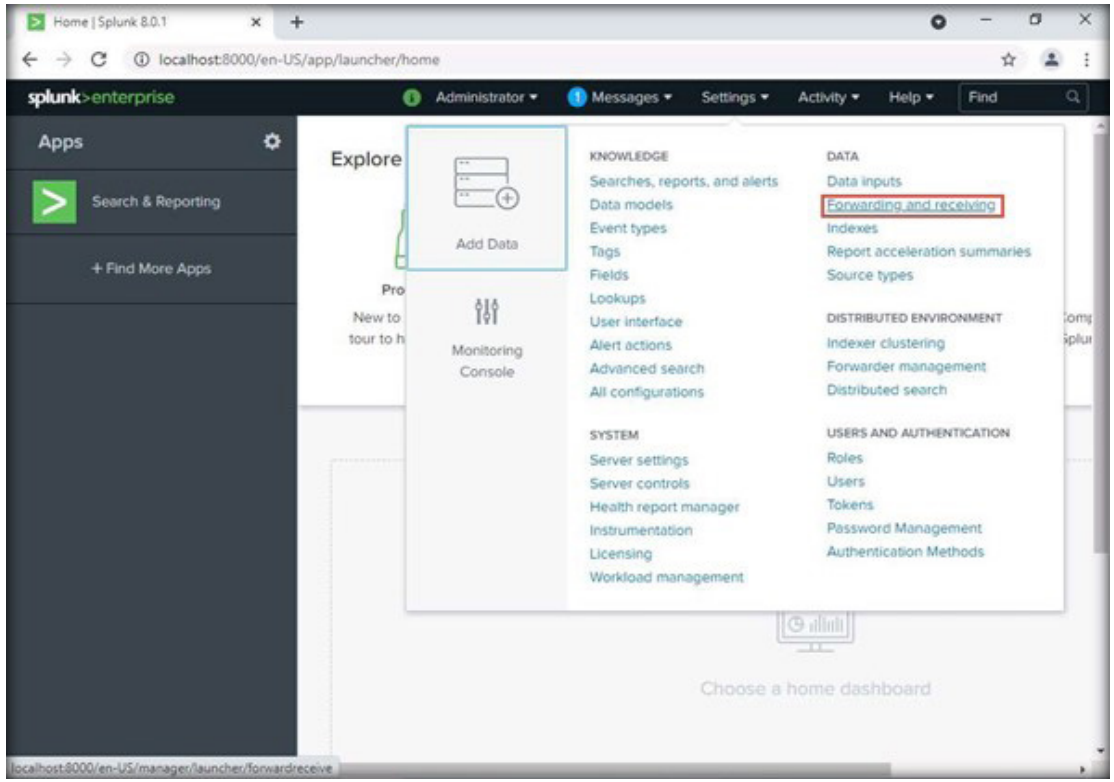
91. Log in with the username **admin** and password **admin@123**.

    Note: If the Splunk Enterprise page is not opening, make sure the splunkd service is running. If not, then press "**Windows+R**" on your keyboard and type "**services.msc**". Click on **OK**. Next, the Services window opens. Search for the **splunkd** service and **restart**. Wait for the service to start.

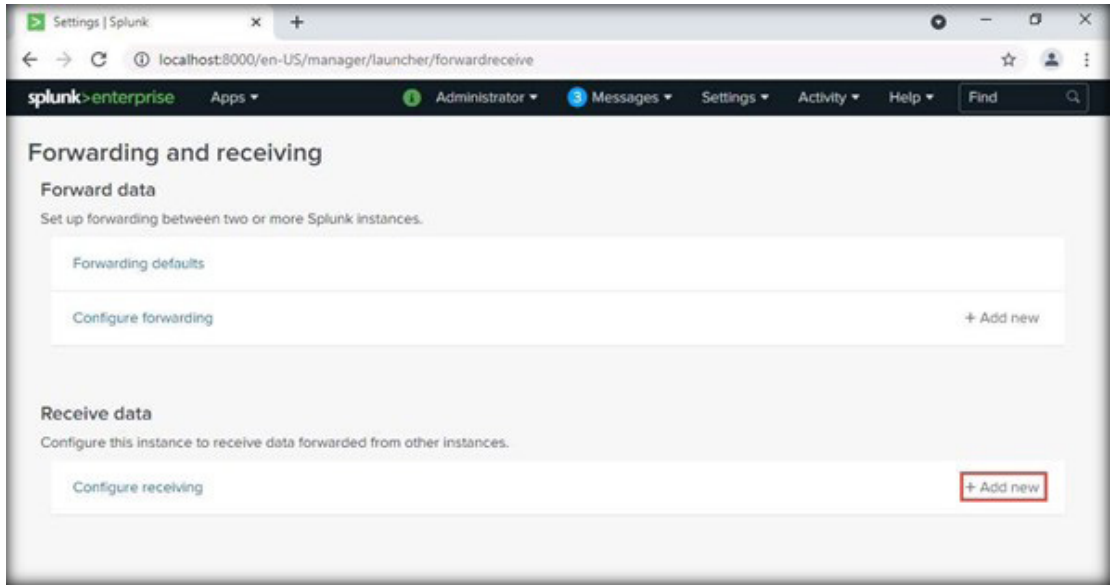
    Note: If **Important Changes coming!** pop-up appears, click **Don't show me this again**.

92. The Splunk web console appears; click **Settings** menu, select **Forwarding and receiving** link under the **DATA** section

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

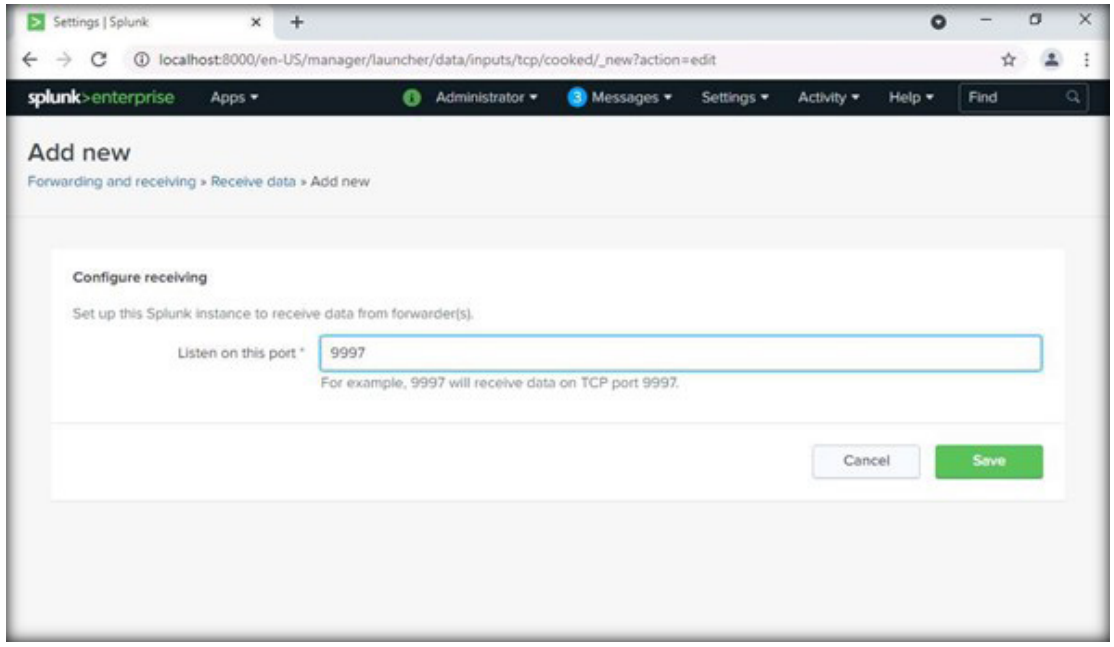


93. The Forwarding and receiving console will appear. This is where a new instance will be added to receive the data forwarded from Universal Forwarder. Click on the **+Add new** link in the bottom right corner to **Configure receiving**.



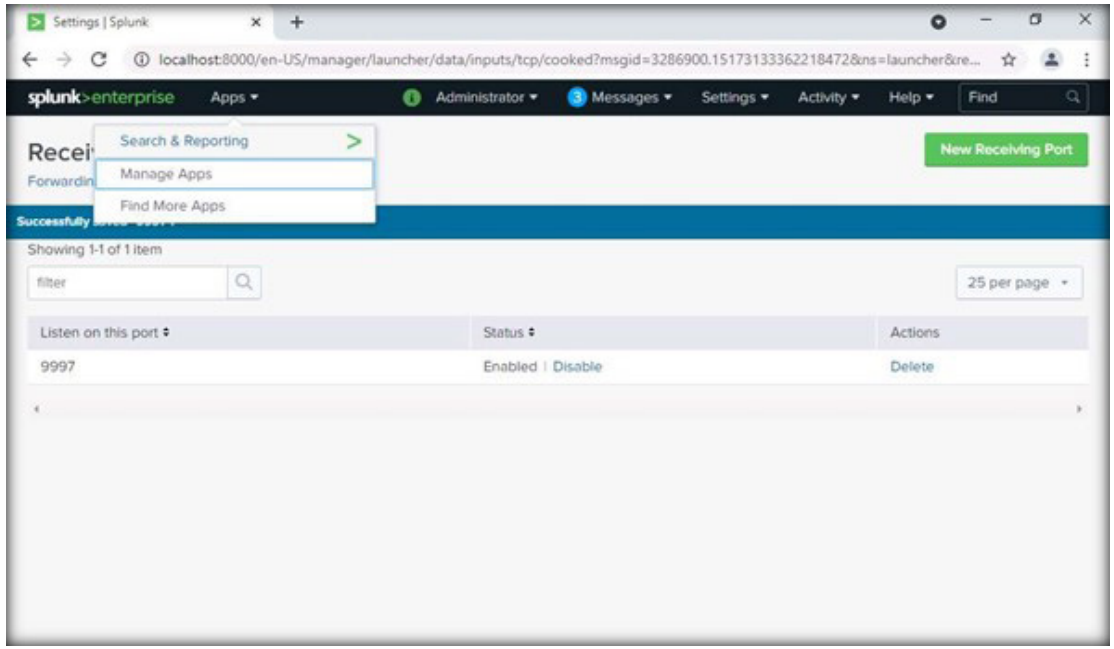
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

94. The **Add new** console appears; in the **Listen on this port*** field, type **9997** and click on **Save**.



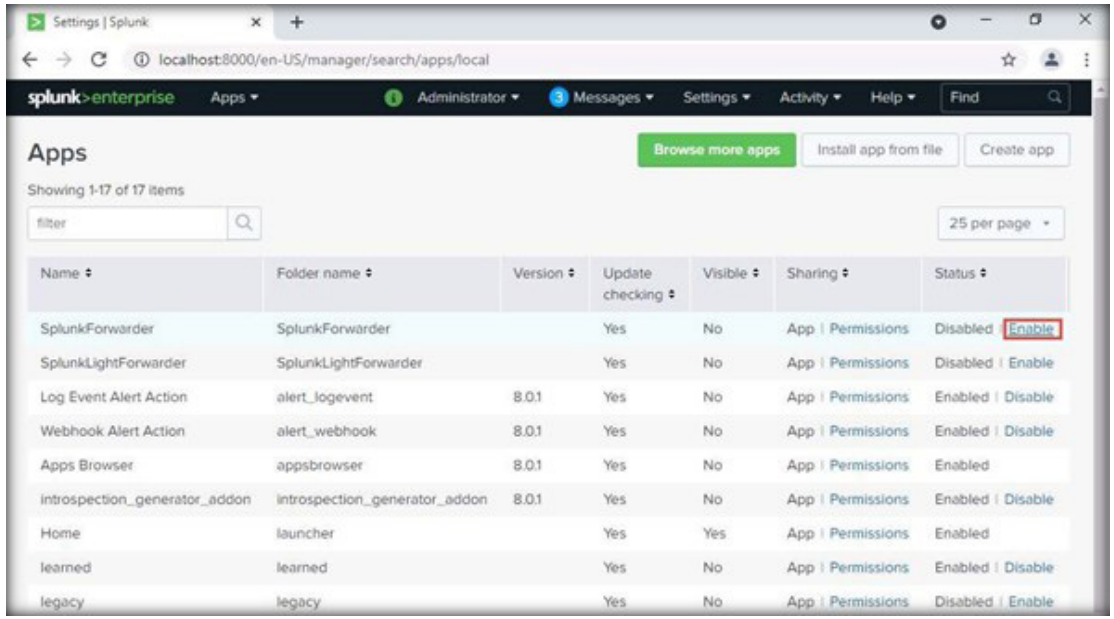
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

95. Once the port is added, go to **Apps** menu, and then select **Manage Apps**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

96. The Apps console appears; click on the **Enable** link toward the extreme right associated with the **SplunkForwarder** application.



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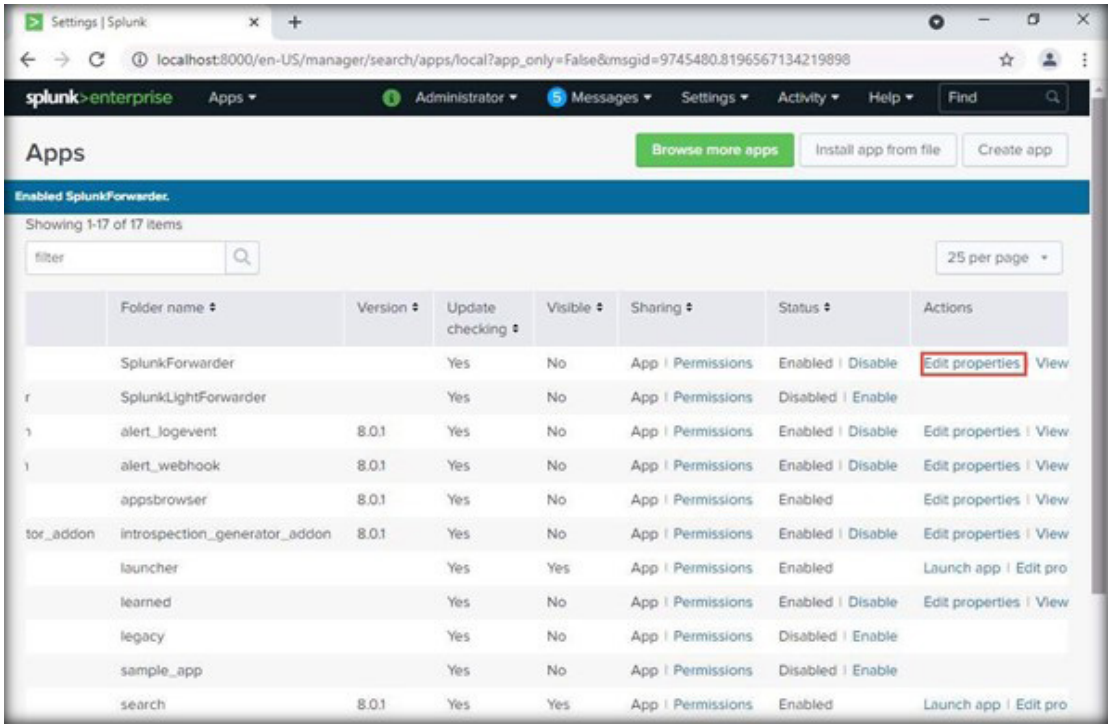
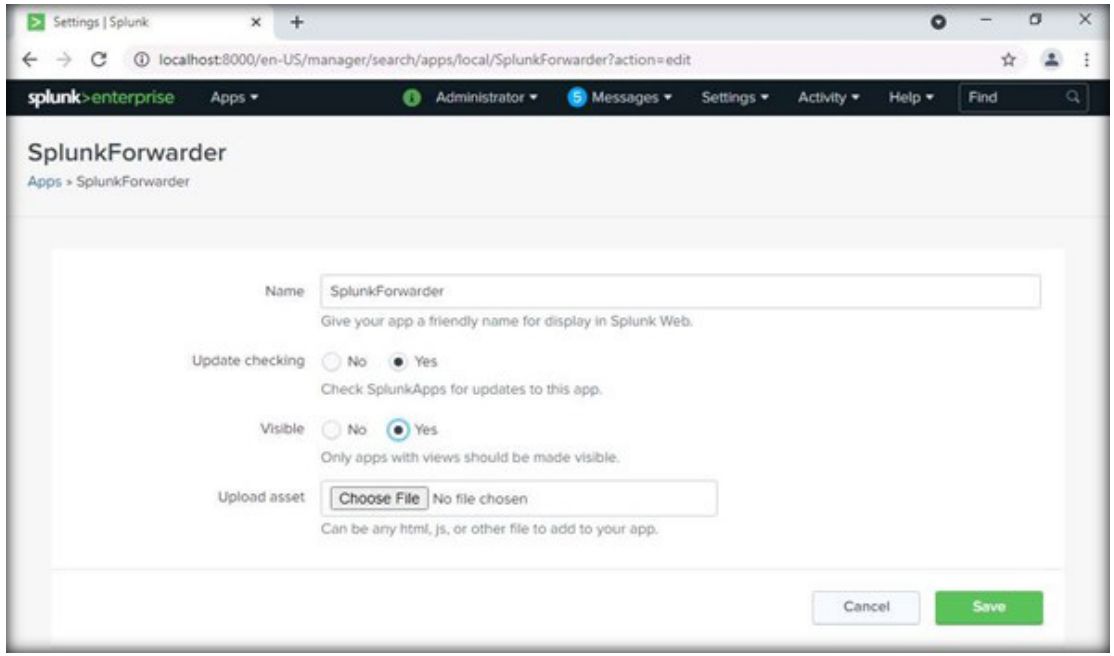
97. When the application is enabled, click on **Edit properties** under **Actions** column associated with **SplunkForwarder**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

98. The SplunkForwarder console appears; click on **Yes** under the **Visible** section, and then on **Save**.



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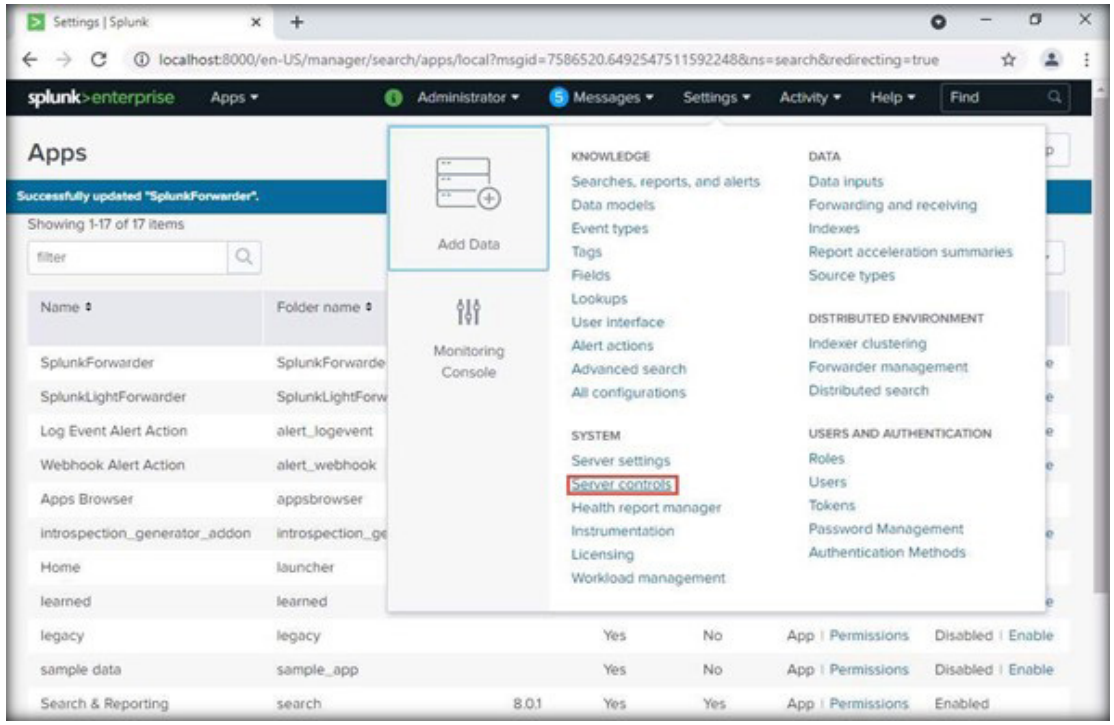
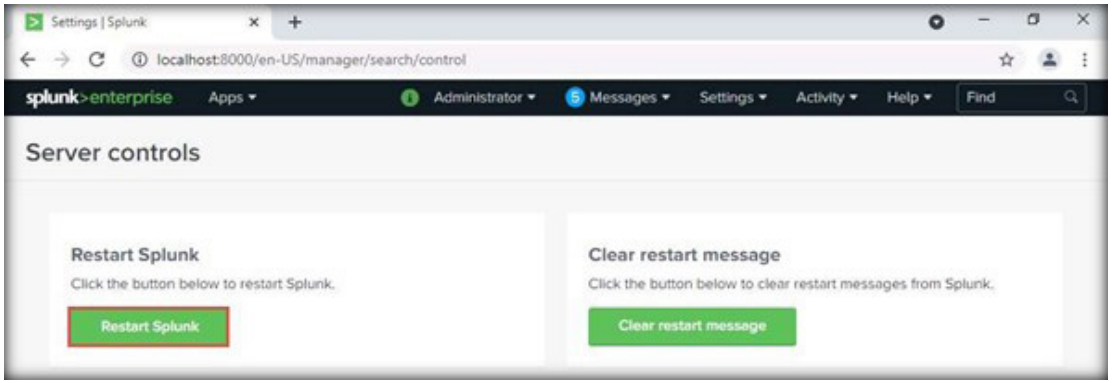
99. Go to **Settings** and select **Server controls** under the **SYSTEM** section.

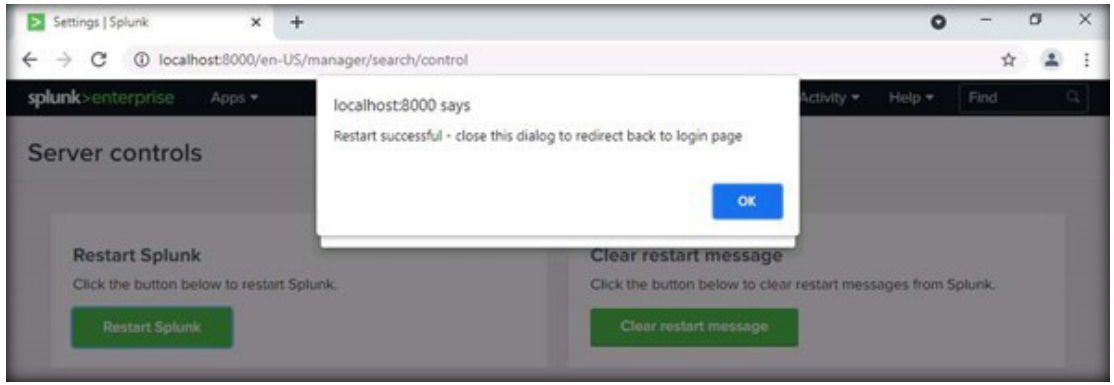


100. The **Server controls** console appears; click on **Restart Splunk**. A confirmation pop-up appears; click on **OK**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

101. Wait for few seconds, on a successful restart, a pop-up appears with the message "**Restart successful**". Click **OK** to log back into Splunk. Click on **OK**.



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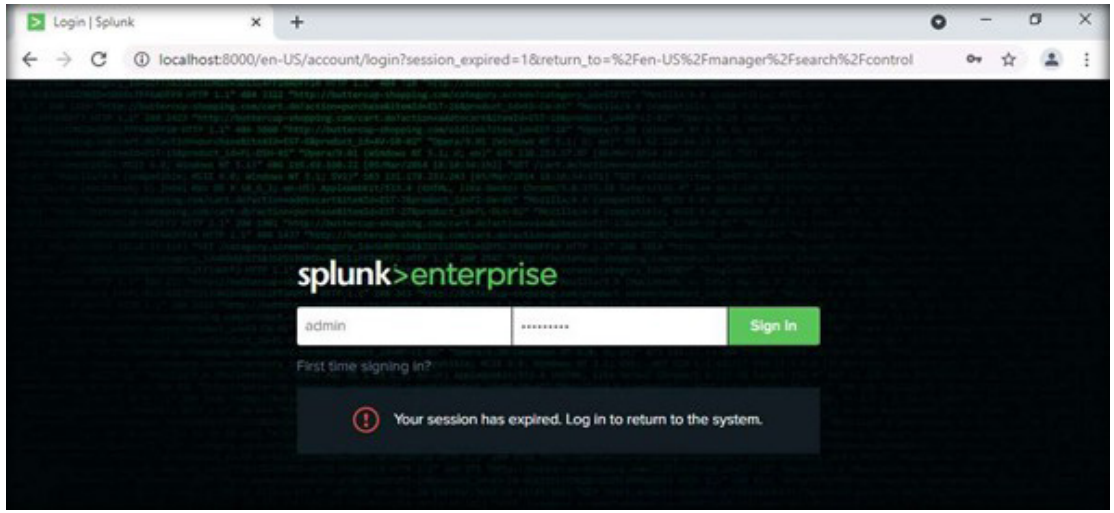
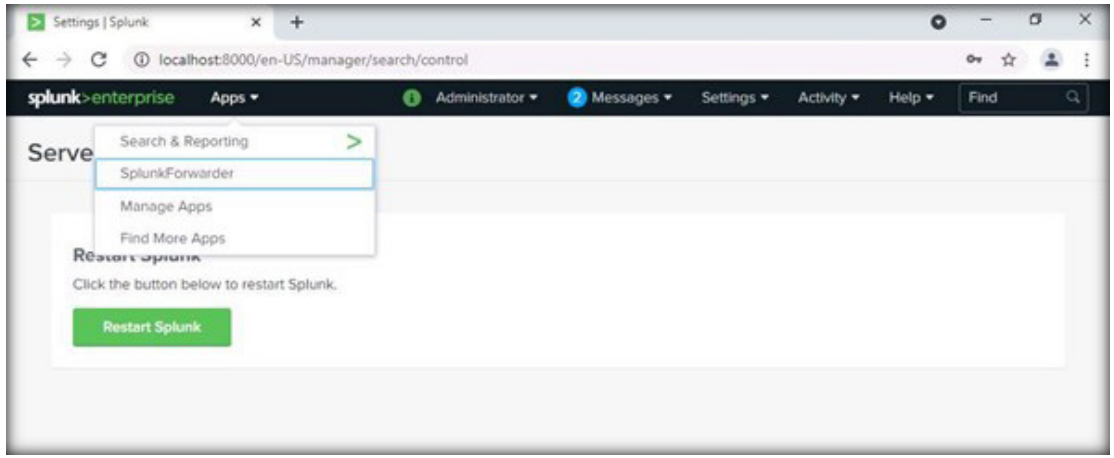
102. You will be redirected to the login page. Enter the user credentials (username **admin** and password **admin@123**) and click on **Sign In**.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

Note: If Splunk is properly not restarted, click **Restart Splunk again**.

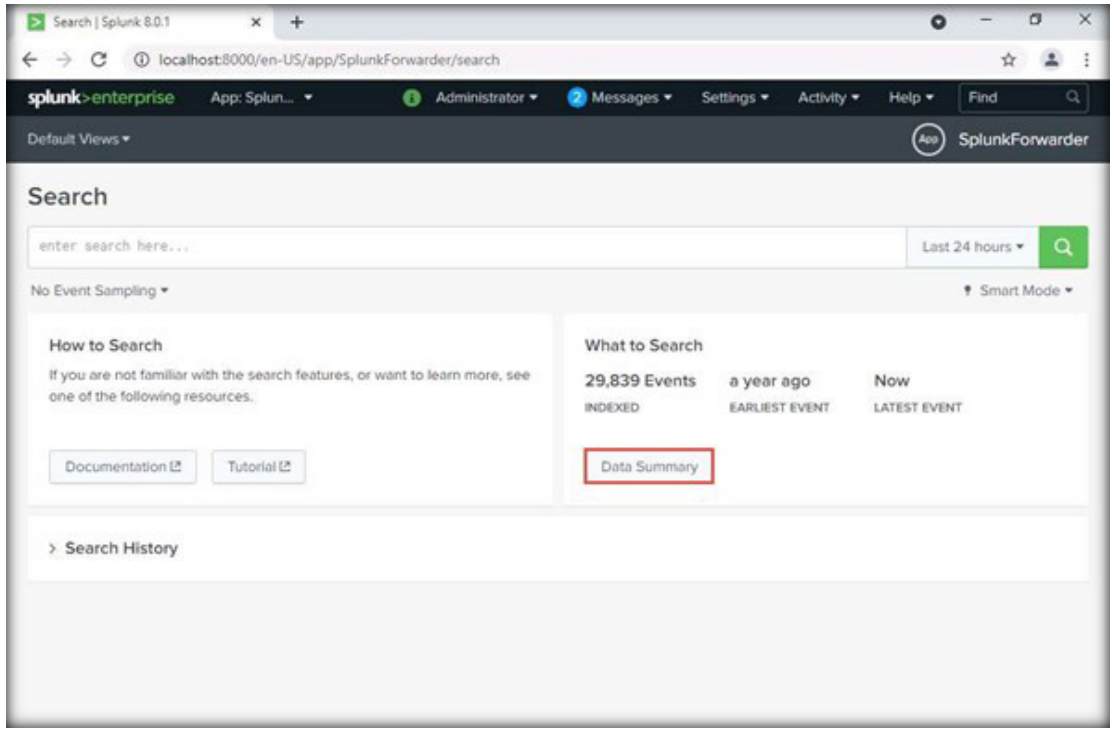
103. Once you log in, click on **Apps > SplunkForwarder** from menu.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

Note: Make sure Splunk Forwarder service is running. If it is not running, start the Splunkforwarder service in Windows services.

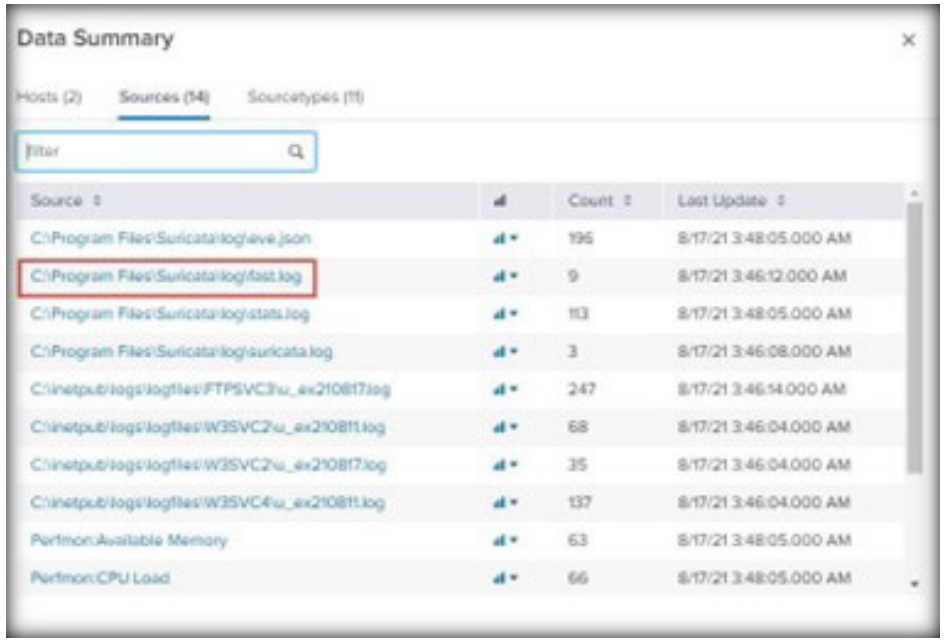
104. The **Search** console appears; click on **Data Summary** under the **What to Search** section.



EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

105. The **Data Summary** pop-up appears. Select the **Sources (_)** tab, wait for some time, and then click the **C:\Program Files\Suricata\log\fast.log** link to continue.

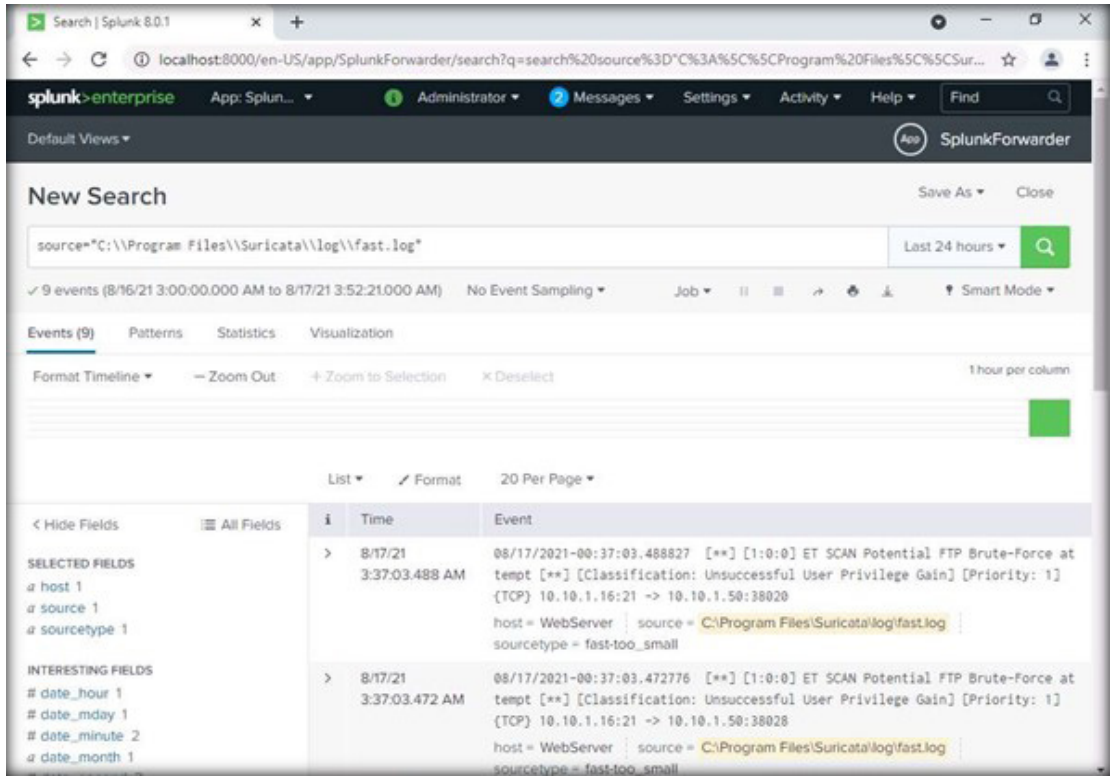
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



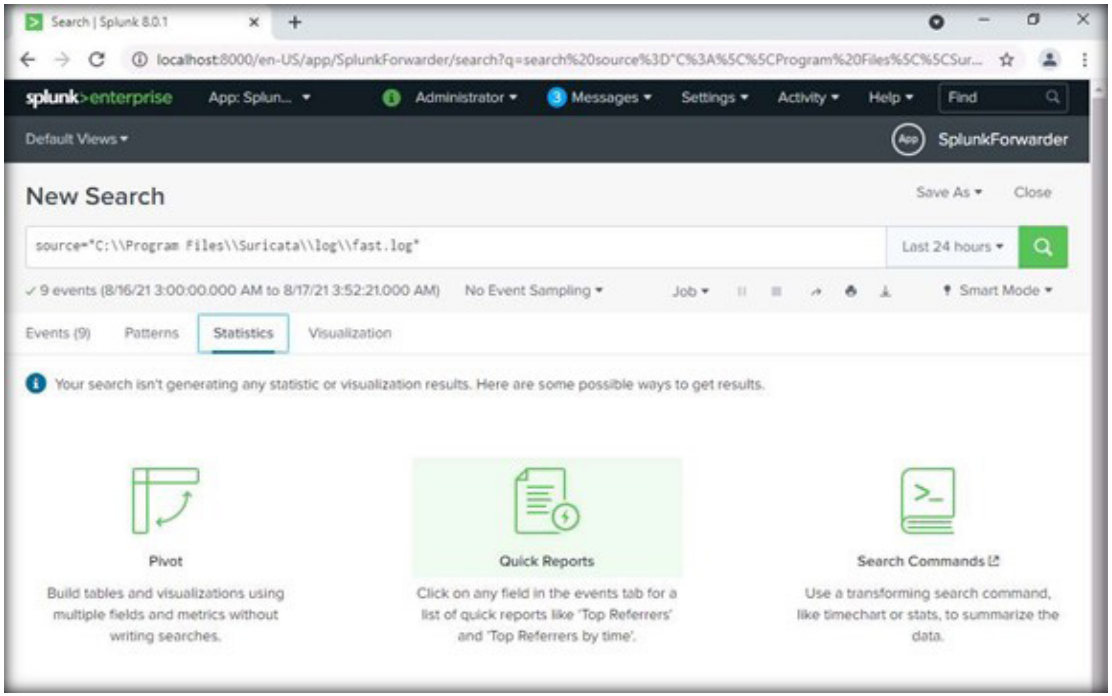
106. Once the **fast.log** file is selected, the page redirects to the search page and displays the detailed logs.

107. The brute-force attempt was made from Attacker Machine-1 **(10.10.1.50)** to the Web Server **(10.10.1.16)**.
Note: The number of **Events** might vary in your lab environment.

EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

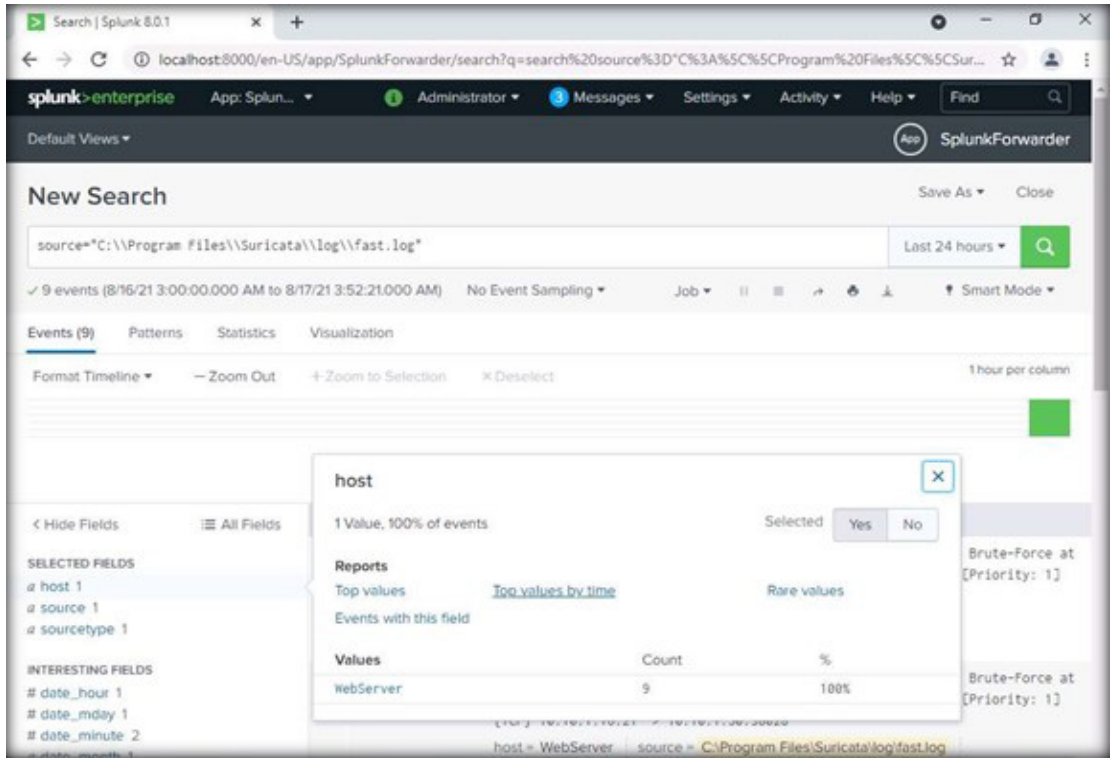


108. Click on **Statistics** tab and **Quick Reports**.



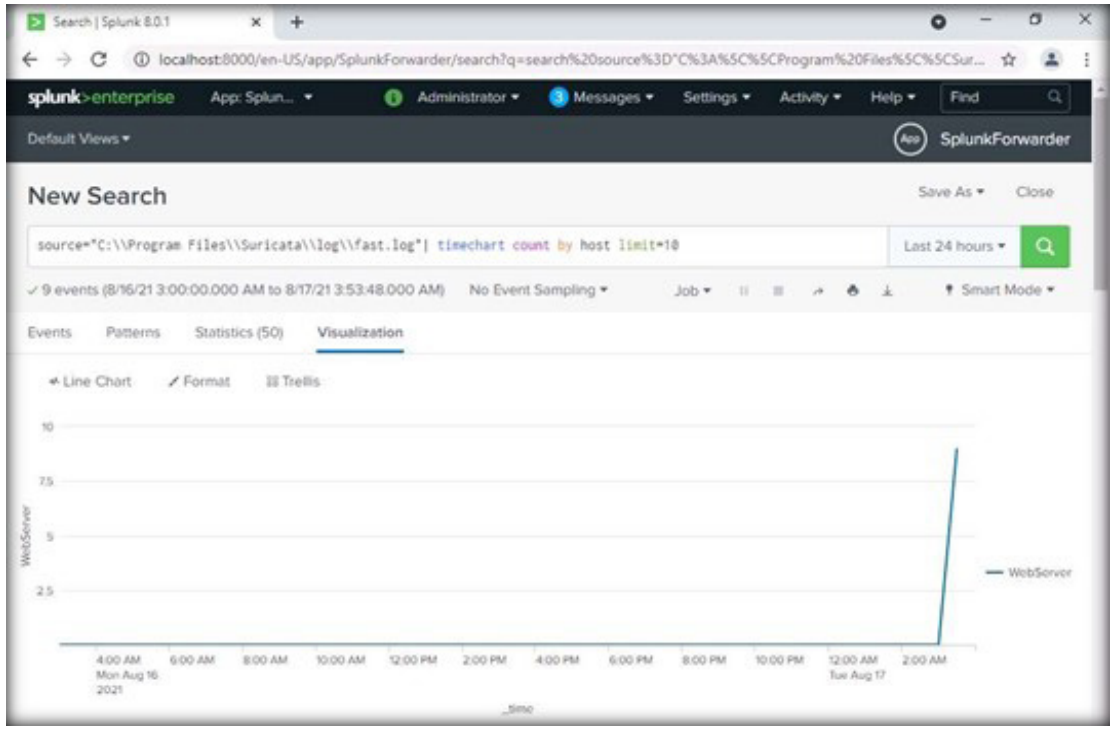
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS

109. You will be redirected to the host window, in the host window click on any value under Reports to see the graphical representation of that value. Here we are selecting **Top values by time**.



110. You will be redirected to **Visualization** tab where you can find the **Line Chart** of the selected option.

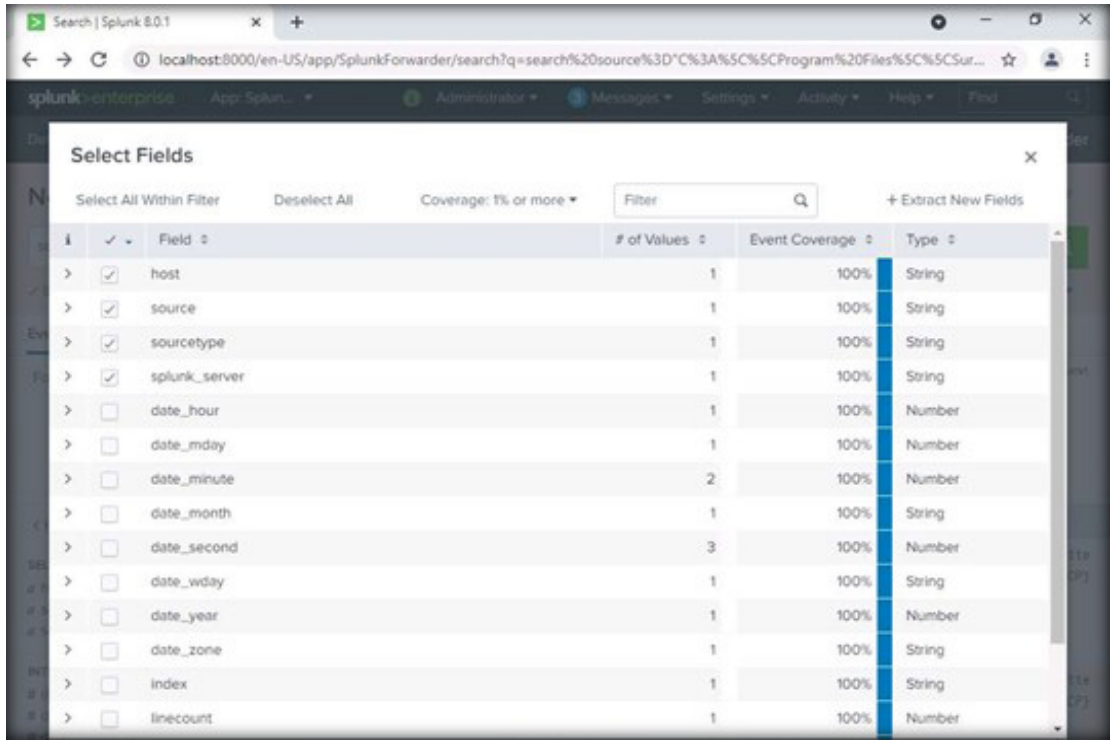
EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



111. Click on back button on the chrome browser to get back to the **Events** tab.

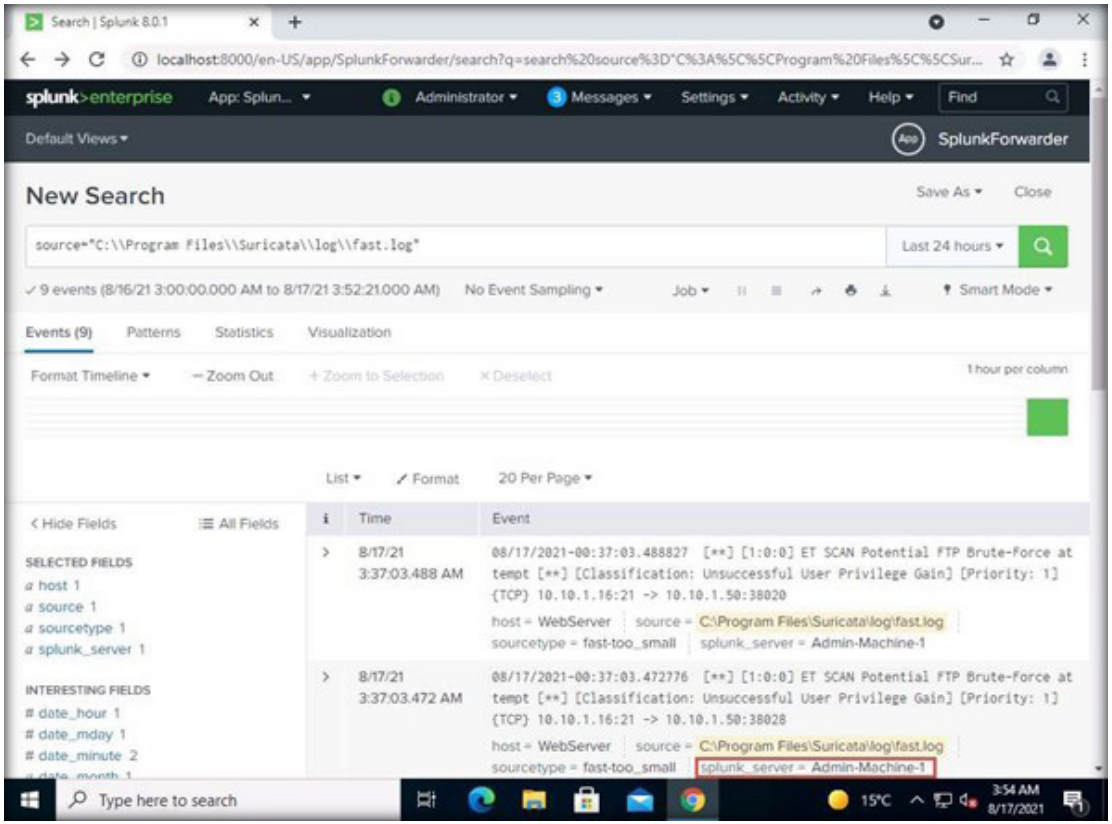
112. Click on **All Fields** option at the left panel of the window to select the options that can be visible in the events tab. Here we are selecting **splunk_server** option, after selecting the options close the **Select Fields** window.

EXERCISE 6: IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



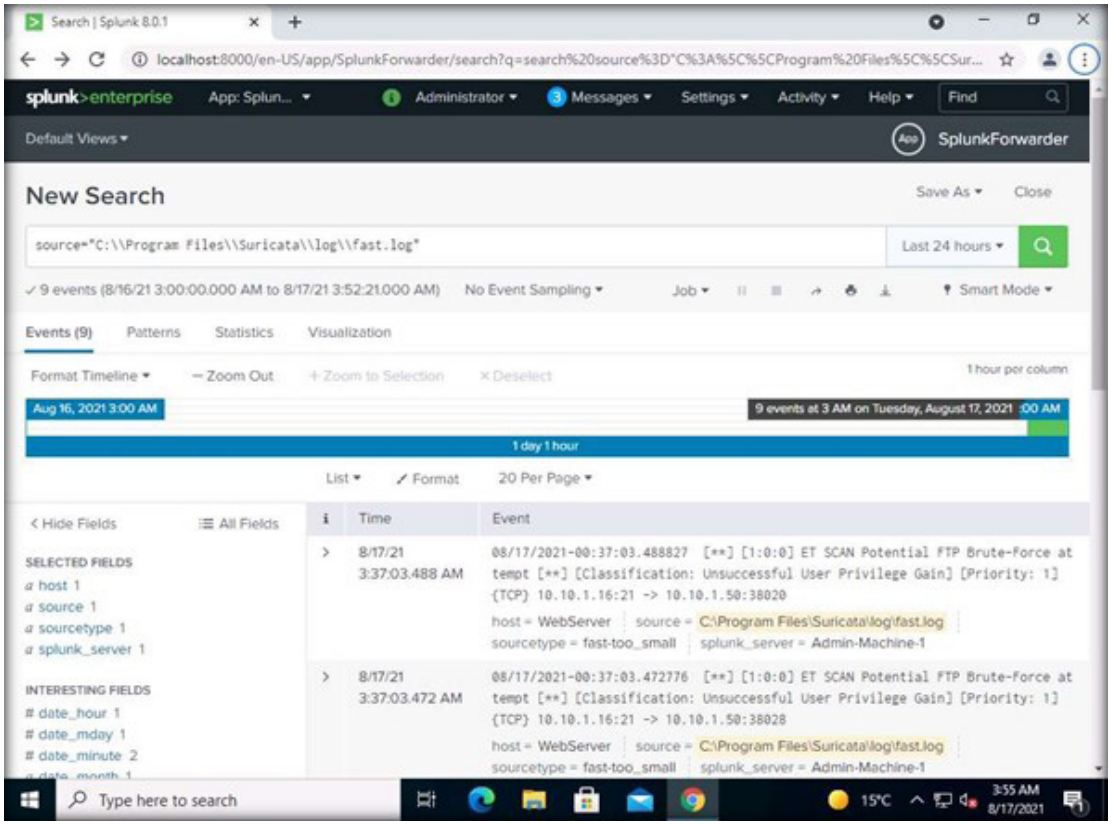
113. We can see that the **splunk_server (Admin Machine-1)** is visible in the **Event** tab.

EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



114. Scroll the cursor under the **Format Timeline** option you can see that the events are recorded in hourly basis, in real time the Administrator can just click on the time in which he wants to review the information.

EXERCISE 6:
IMPLEMENT NETWORK-BASED IDS FUNCTIONALITY USING SURICATA IDS



115. Close the web browser in **Admin Machine-1** virtual machine.

116. Close all open windows in **Web Server** virtual machine.

117. Turn off the **Web Server** virtual machine.

EXERCISE 7: **DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT**

Network traffic monitoring is the process of capturing network traffic and inspecting it closely to determine what is happening on the network.

LAB SCENARIO

A security professional must have the required knowledge to detect malicious traffic in the network. You should constantly strive to maintain smooth network operation. If a network goes down even for a small period, productivity within a company may decline. To be proactive rather than reactive, the traffic movement and performance must be monitored to ensure that no security breach occurs within the network.

LAB OBJECTIVE

This lab demonstrates how to detect malicious network traffic using HoneyBOT.

OVERVIEW OF NETWORK TRAFFIC MONITORING

The network monitoring process involves sniffing the traffic flowing through the network. For this purpose, network packets must be captured, and a signature analysis must be conducted to identify any malicious activity.

Networking monitoring assists security professionals in identifying possible issues before they affect business continuity. If an issue occurs in the network, the root cause can be determined easily with network monitoring, and with network automation tools, the problem can be fixed automatically. Networking monitoring not only prevents outages but also gives visibility to potential issues. Continuous network monitoring minimizes downtime and increases the performance of the network.

LAB TASKS

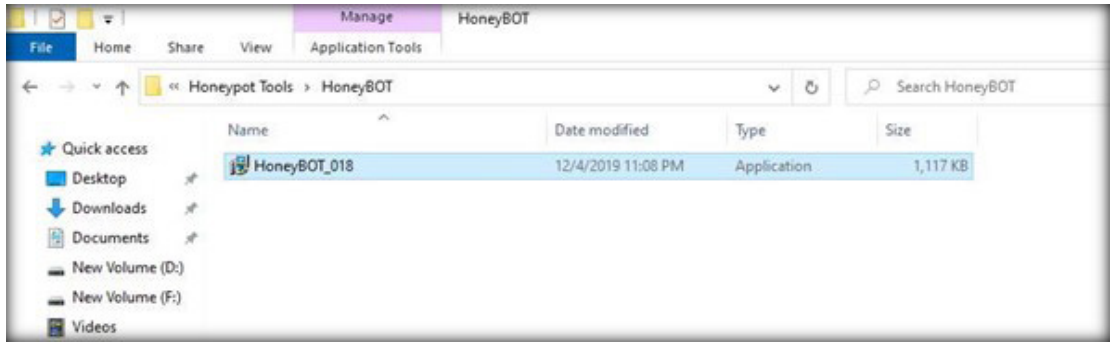
Note: Ensure that **Admin Machine-1, Attacker Machine-1** and **PfSense Firewall** are running.

EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

1. Switch to the **Admin Machine-1** virtual machine.

2. Navigate to **Z:\CCT-Tools\CCT Module 07 Network Security Controls - Technical Controls\Honeypot Tools\HoneyBOT**. Double-click **HoneyBOT_018.exe** to launch the HoneyBOT installer. Follow the wizard-driven steps to install HoneyBOT.

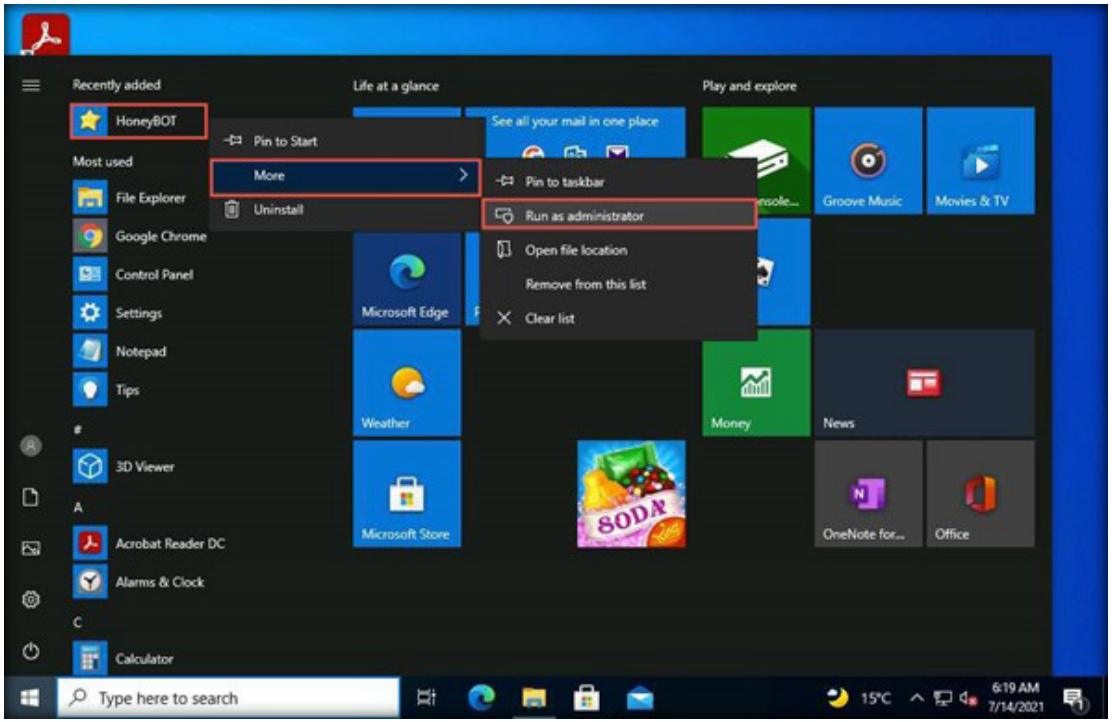
Note: If the **User Account Control** window appears, click **Yes**.



3. Once the installation of HoneyBOT completes, in the **Completing the HoneyBot Setup Wizard** window, uncheck the **Launch HoneyBOT** option, click **Finish**.

4. Now, click the **Start** icon from the left-bottom of **Desktop**. Under **Recently added** applications, right-click **HoneyBOT > More > Run as administrator**, as shown in the screenshot.

Note: If the **User Account Control** window appears, click **Yes**.



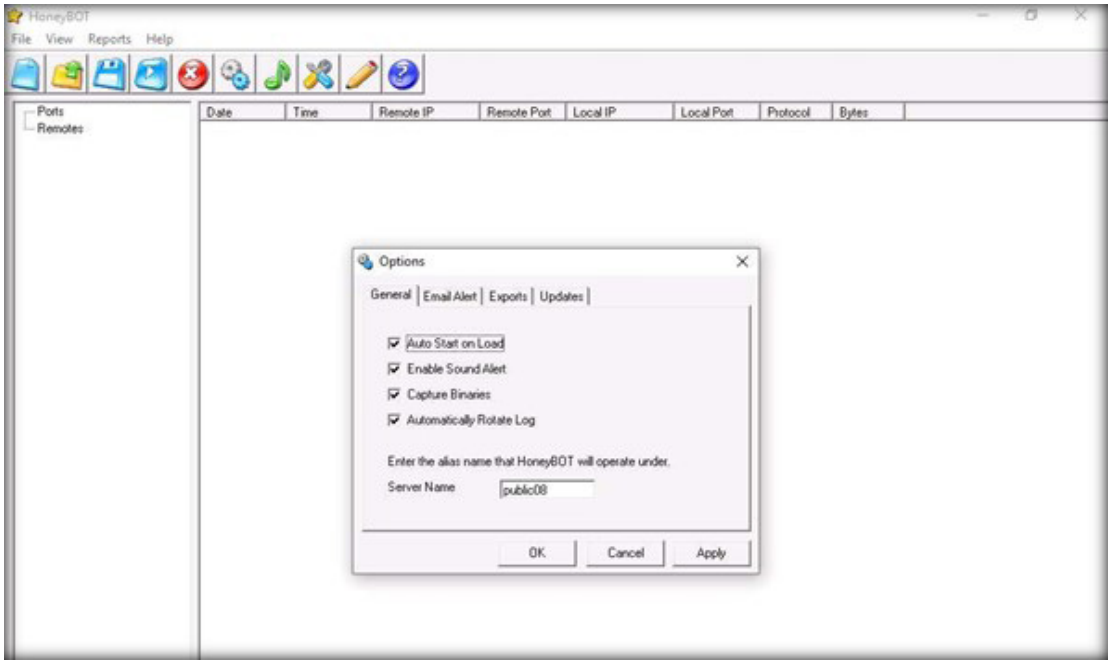
EXERCISE 7: DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

5. The **HoneyBOT** configuration pop-up appears; click **Yes** to configure HoneyBOT.

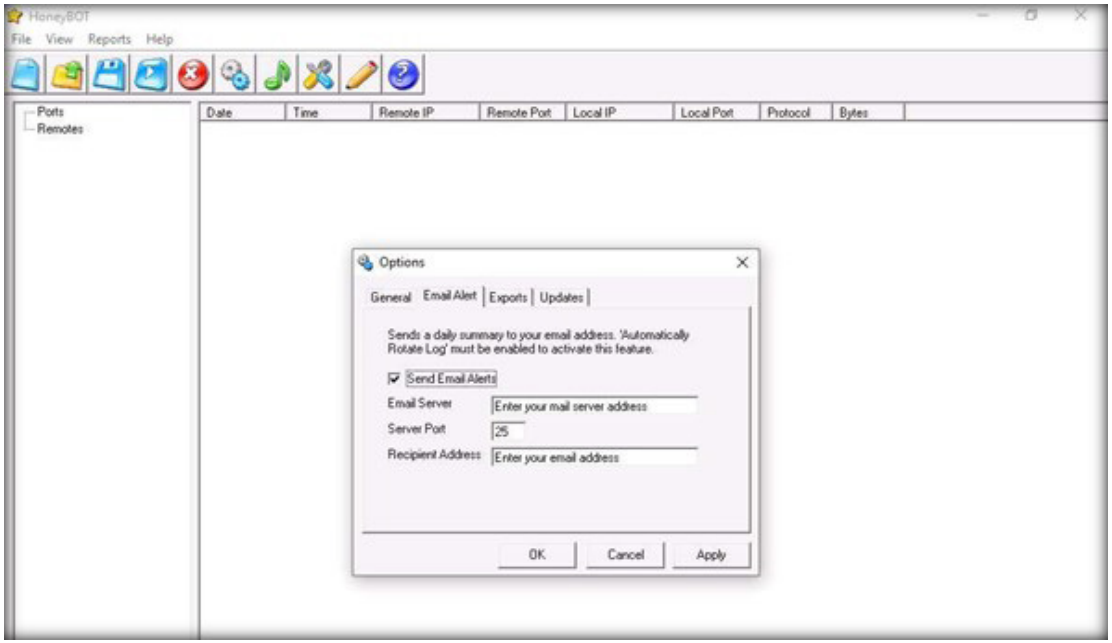
6. The HoneyBOT **Options** window appears with default options checked on the **General** settings tab. Leave the default settings or modify them accordingly.

7. In this task, we are leaving the settings on default for the **General** tab in the **Options** window.

EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

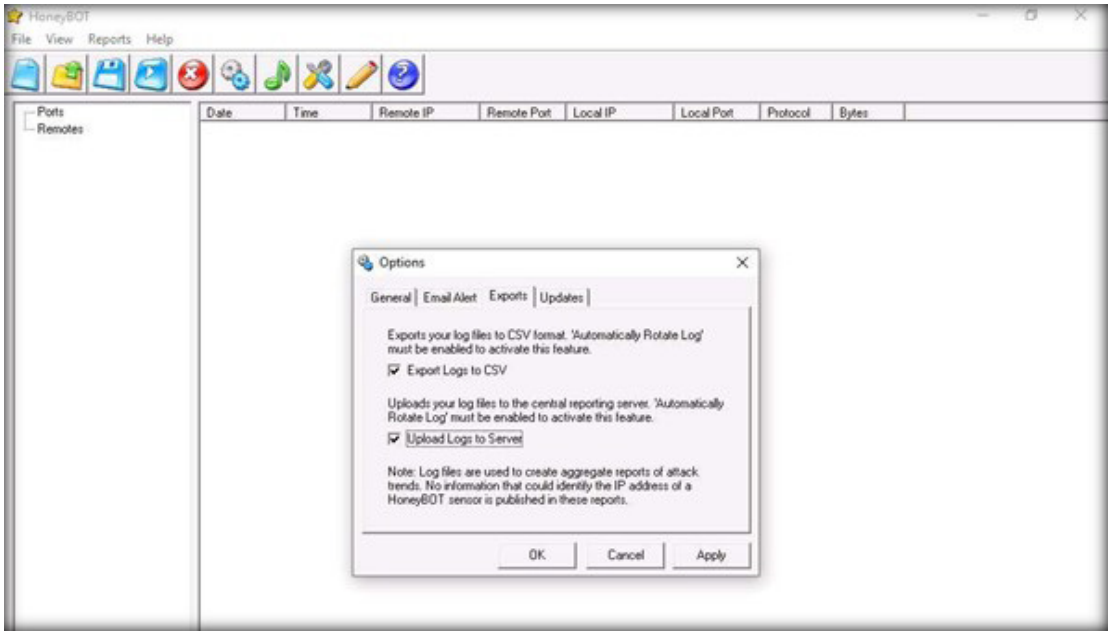


8. Click the **Email Alert** tab; if you want HoneyBOT to send you email alerts, check **Send Email Alerts**, and fill in the respective fields.
   Note: In this task, we will not be providing any details for email alerts.



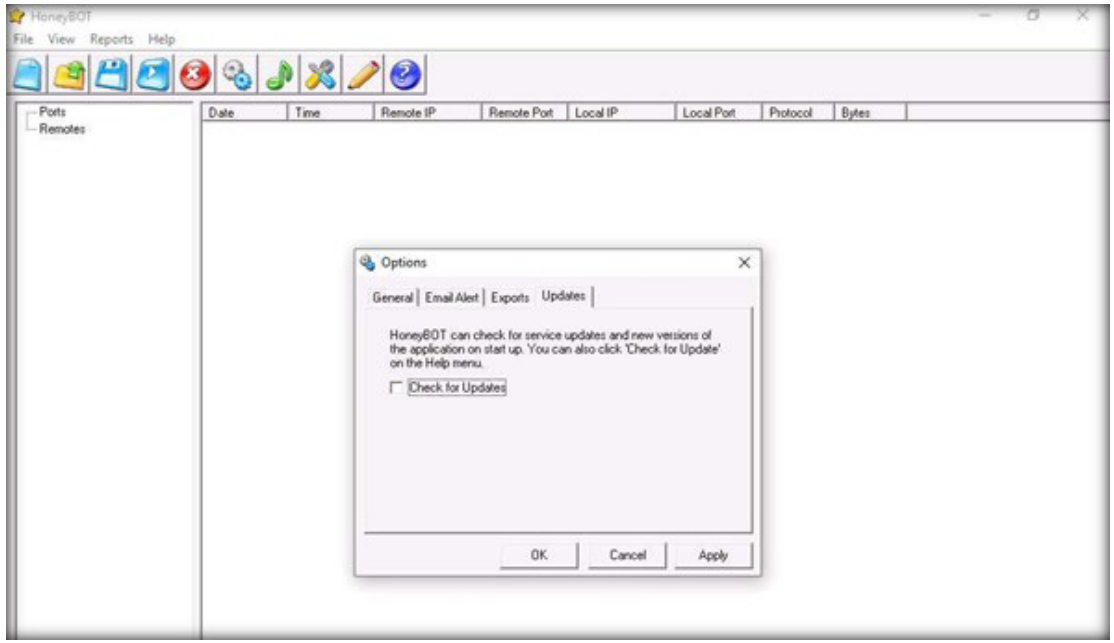
EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

9. On the **Exports** tab, in which you can export the logs recorded by HoneyBOT, choose the required option to view the reports, and then proceed to the next step. (Here, **Export Logs to CSV** and **Upload Logs to Server** checkbox are selected)



EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

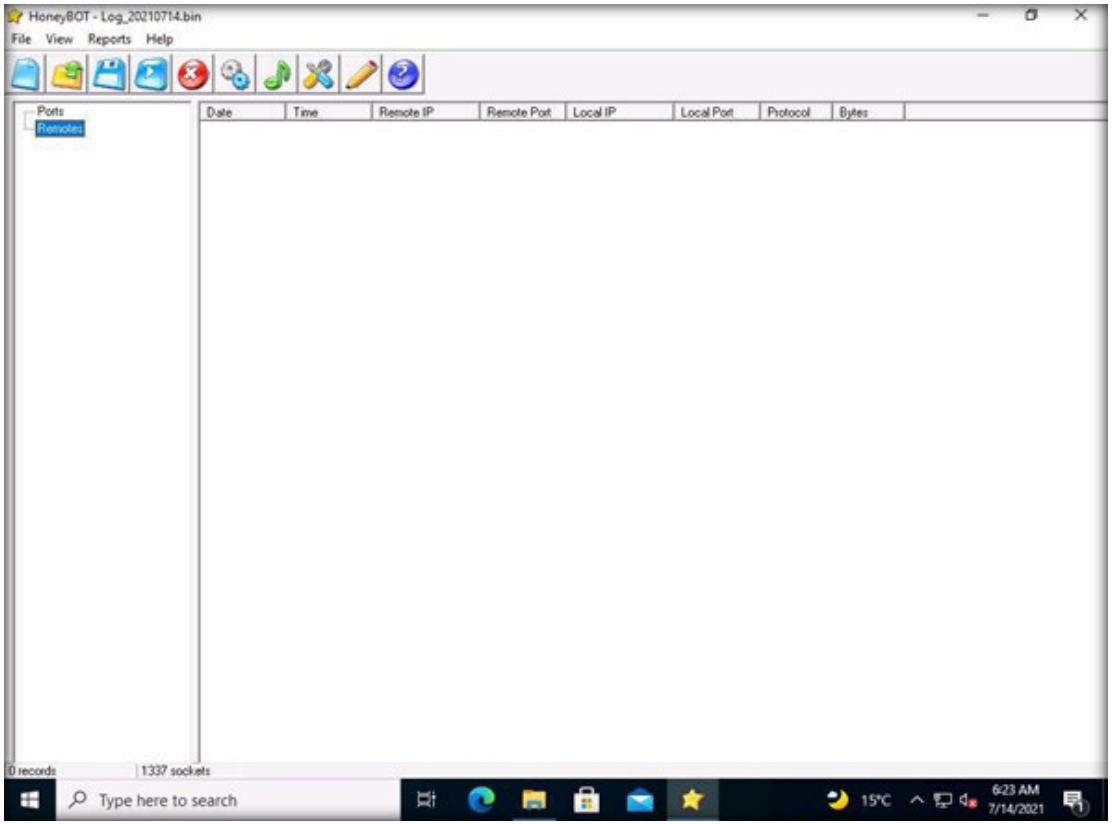
10. On the **Updates** tab, uncheck **Check for Updates;** click **Apply** and click **OK** to continue.
    Note: If a **Bindings** pop-up appears, click **OK** to continue.



EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

11. The **HoneyBOT** main window appears, as shown in the screenshot.

EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT



12. Now, leave the HoneyBOT window running on **Admin Machine-1** virtual machine.

13. Switch to the **Attacker Machine-1** virtual machine.

14. Select User **Bob** and type password **user@123** press the **Enter** button.

15. Press **ALT + CTL + T** to open the terminal, type the **sudo su** command for the root user, and press **Enter**.

16. When prompted for the password, type the password for the root user (here the **root** user password is **user@123**), and press **Enter**.
    Note: The password that you type will not be visible.

EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

17. In the terminal window, type **ftp [IP Address of the Admin Machine-1]** and press **Enter**.

18. You will be prompted for the ftp credentials of the **Admin Machine-1** machine.

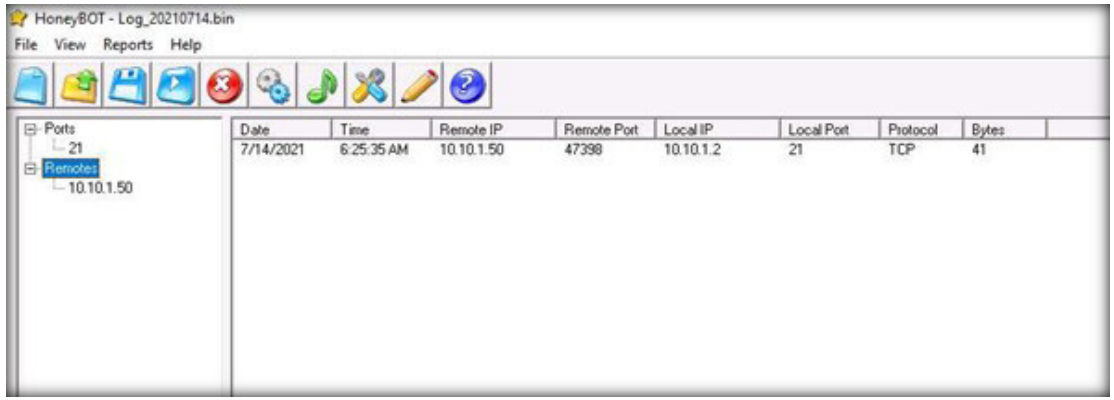
19. In this task, the IP address of **Admin Machine-1** is **10.10.1.2;** this may differ in your lab environment.

EXERCISE 7:
DETECT MALICIOUS
NETWORK TRAFFIC USING
HONEYBOT

20. Switch back to the **Admin Machine-1** virtual machine. In the **HoneyBOT** window, expand the **Ports** and **Remotes** node from the left-pane.

21. Under **Ports**, you can see the port numbers from which **Admin Machine-1** received requests or attacks.

22. Under **Remotes**, you can view the recorded IP addresses through which Admin Machine-1 received requests.



EXERCISE 7: DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

23. Now, right-click any IP address or Port on the left, and click **View Details**, as shown in the screenshot, to view the complete details of the request or attack recorded by HoneyBOT.

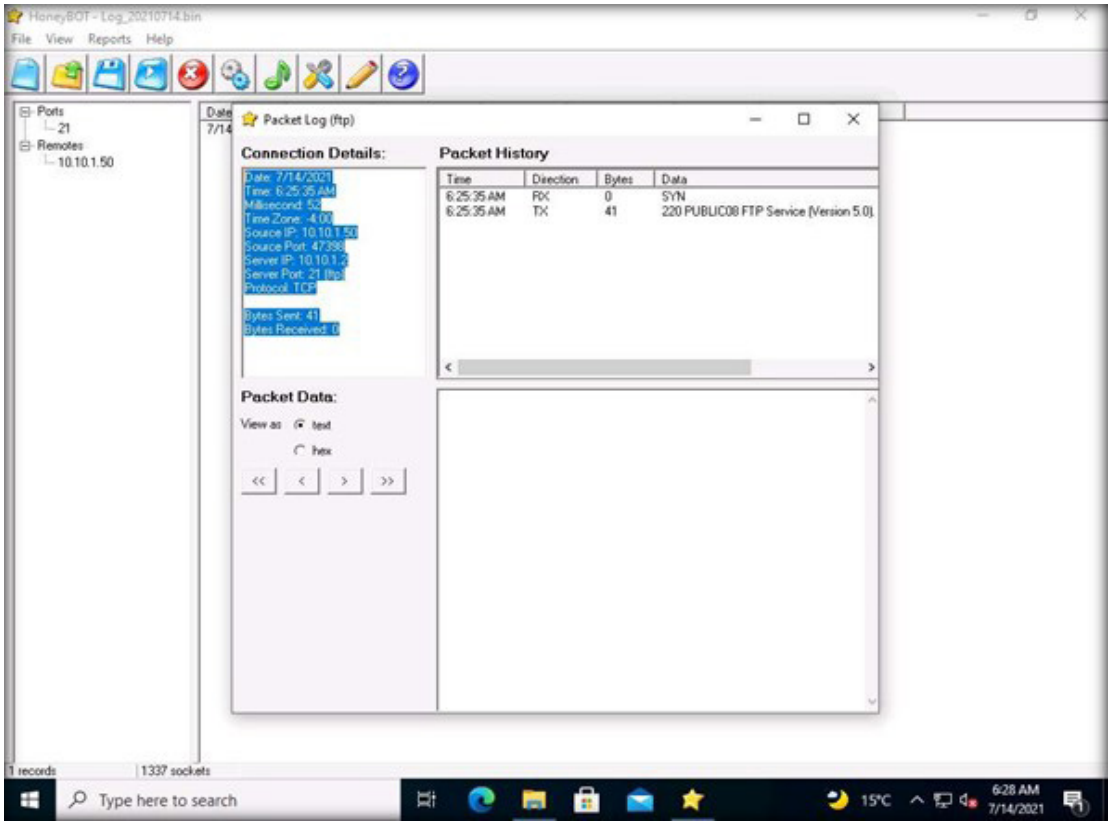
EXERCISE 7: DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT

24. The **Packet Log** window appears, as shown in the screenshot. This displays the complete log details of the request captured by HoneyBOT.

25. In the screenshot, under **Connection Details**, you can view the **Date** and **Time** of the connection established as well as the protocol used.

26. **Connection Details** also shows the **Source IP, Port,** and **Server Port,** as shown below.

EXERCISE 7:
DETECT MALICIOUS NETWORK TRAFFIC USING HONEYBOT



27. Similarly, you can run the telnet command on the **Attacker Machine-1** virtual machine and observe the log recorded by **HoneyBOT** on **Admin Machine-1**.

28. After the completion of this task, open **Control Panel** in the **Admin Machine-1** and uninstall **HoneyBOT**.

29. Turn off the **Attacker Machine-1** virtual machine.

EXERCISE 8: **ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN**

Virtual private network is a private network that uses a public network to connect users/sites remotely.

LAB SCENARIO

Most of the organization has its offices located at different locations around the world. There is a need for establishing a remote connection between these offices as a result. Previously, remote access was established through leased lines with the help of dial-up telephone links such as ISDN, DSL, cable modem, satellite, and mobile broadband. However, establishing remote connections with these leased lines is quite expensive and the costs rise when the distance between the offices increases.

A security professional must have the required knowledge to establish a VPN connection to provide a secure remote access to organization's employees and distant offices.

LAB OBJECTIVE

This lab will demonstrate how to establish a Virtual Private Network (VPN) connection using SoftEther VPN.

OVERVIEW OF VIRTUAL PRIVATE NETWORK

A virtual private network (VPN) offers an attractive solution for security professionals to connect their organization's network securely over the Internet. VPN is used to connect distant offices or individual users to their organization's network over a secure channel. VPN uses a tunneling process to transport encrypted data over the internet.

IPsec is the common protocol used in VPN at the IP level. VPN ensures the data integrity check by using a message digest and ensures data transmission is not tampered with. VPN guarantees the quality of service (QoS) through service level agreements (SLA's) with the service provider.

LAB TASKS

Note: Before starting this lab exercise, make a note of your public IP. To know your public IP, open up any web browser and browse for google.com. In the Google search, type **what is my IP** and click **search**. Your public IP will be displayed.

Note: Ensure that **Admin Machine-1** and **PfSense Firewall** virtual machines are running.

1. Turn on the **AD Domain Controller** virtual machine.

2. Log in with the credentials **CCT\Administrator** and **admin@123**.

   Note: If the network screen appears, click **Yes**.

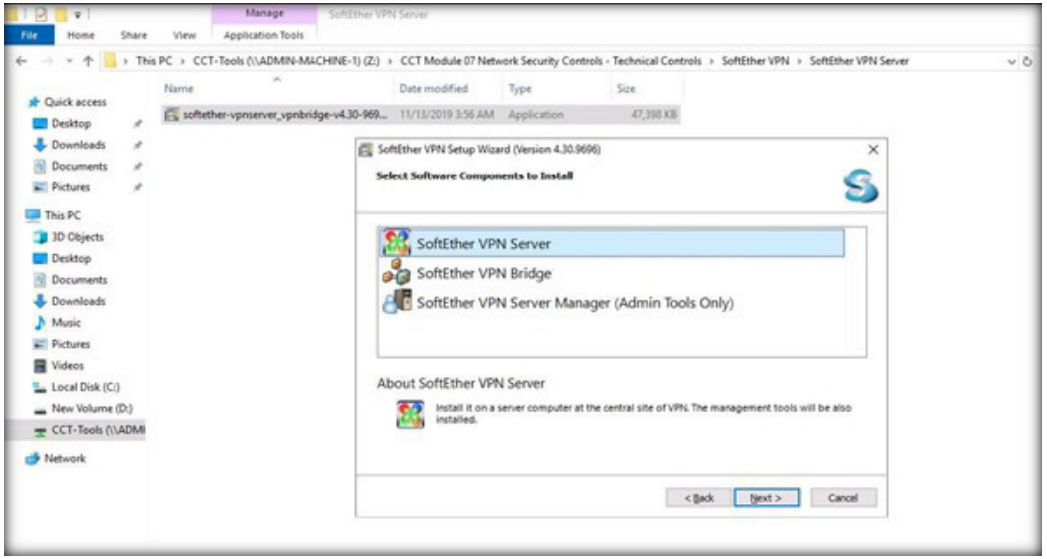
3. To install **SoftEther VPN Server**, navigate to **Z:\CCT Module 07 Network Security Controls - Technical Controls\SoftEther VPN\SoftEther VPN Server**. Double click **softether-vpnserver_vpnbridge-v4.30-9696-beta-2019.07.08-windows-x86_x64-intel**.

   Note: If the **Open File – Security Warning** window appears, click **Run**.

   Note: You can download the latest version of **SoftEther VPN Server** from **https://www.softether-download.com**. If you use the downloaded file, the screenshots in the lab may vary.

4. The **SoftEther VPN Setup Wizard** appears. Click **Next**.

5. In the **Select Software Components to Install** wizard, **SoftEther VPN Server** is selected by default. Retain the default selection and click **Next**.



EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

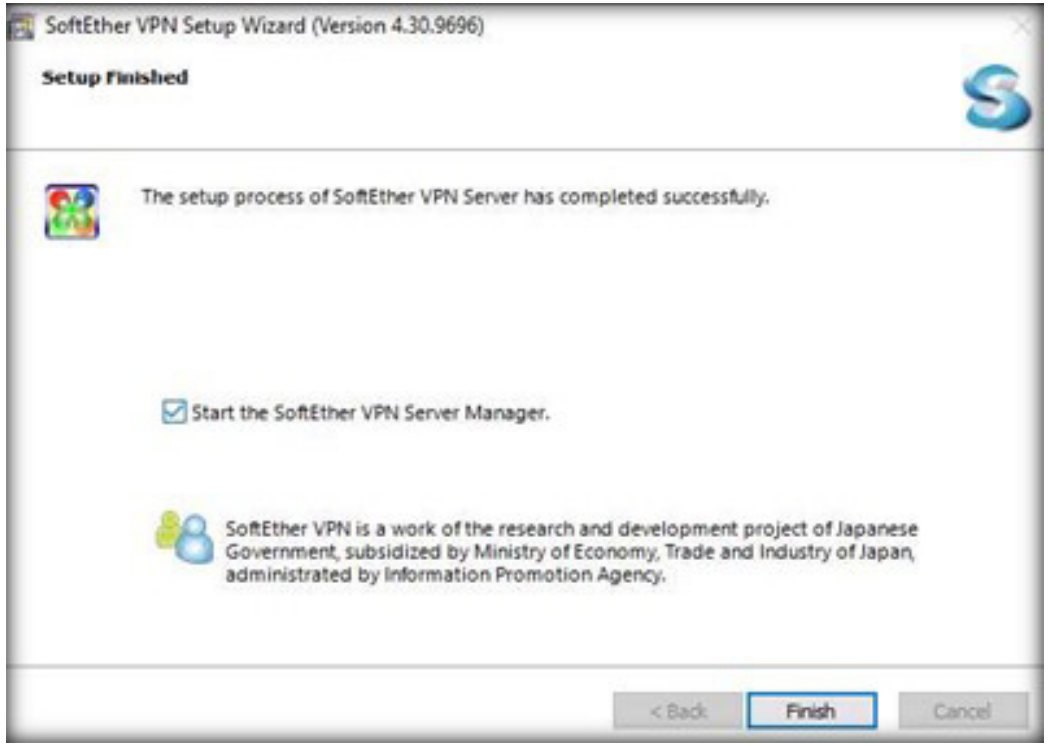
6. The **End User License Agreement** wizard appears. Check **I agree to the End User License Agreement**. Click **Next**. Follow the wizard-driven installation steps to install **SoftEther VPN Server Manager**.

7. The **Important Notice** window appears. Click **Next**.

8. Continue the installation until you see the **Setup Finished** wizard appears. Ensure that the **Start the SoftEther VPN Server Manager** option is checked to launch it automatically. Click **Finish**.

Note: Alternatively, you can also launch the application by double-clicking the shortcut icon on the Desktop.

EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



9. The **SoftEther VPN Server Manager** window appears. Click the **Connect** button to configure the VPN Server.
   Note: If an **Update Available** pop-up appears, click on **Do Not Show this Message Again**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

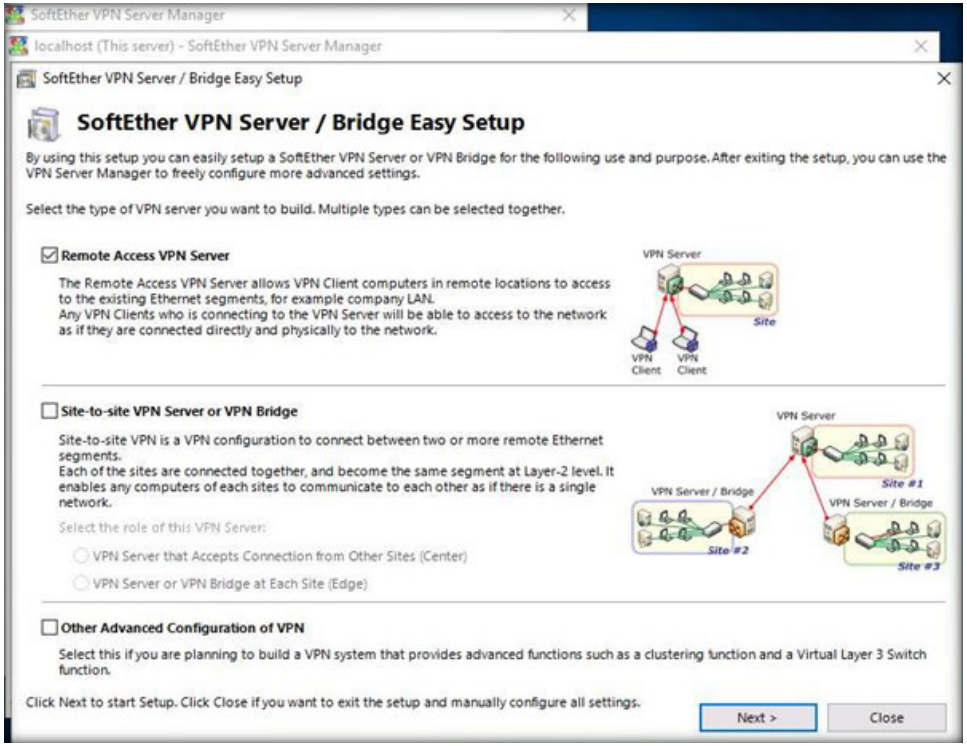
10. When you connect for the first time, you will be prompted to set the Administrator password for the Server Manager. Type in the password in the **New Password** field and retype the same password in the **Confirm Password** field (in this lab, the password was set to **user@123**). Click **OK**.

EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

11. After this, the password will be changed. A confirmation pop-up appears. Click **OK**.

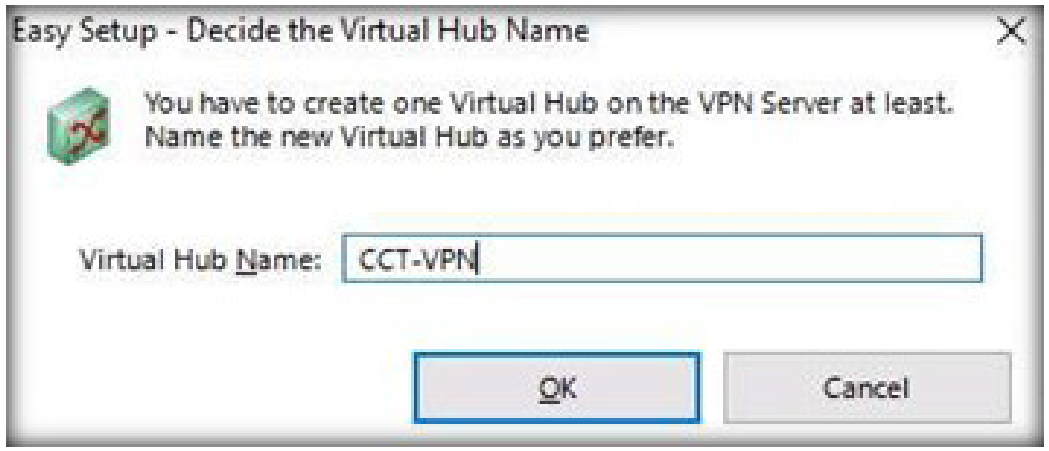
12. The **SoftEther VPN Server / Bridge Easy Setup** wizard appears. Check **Remote Access VPN Server**. Click **Next**.
    Note: If an **Update Available** pop-up appears, click on **Do Not Show this Message Again**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



13. The **SoftEther VPN Server Manager** pop-up appears. Click **Yes**.

14. The **Easy Setup - Decide the Virtual Hub Name** pop-up appears. Specify the **Virtual Hub Name** in the field (in this exercise, the name is set as **CCT-VPN**) and click **OK**.

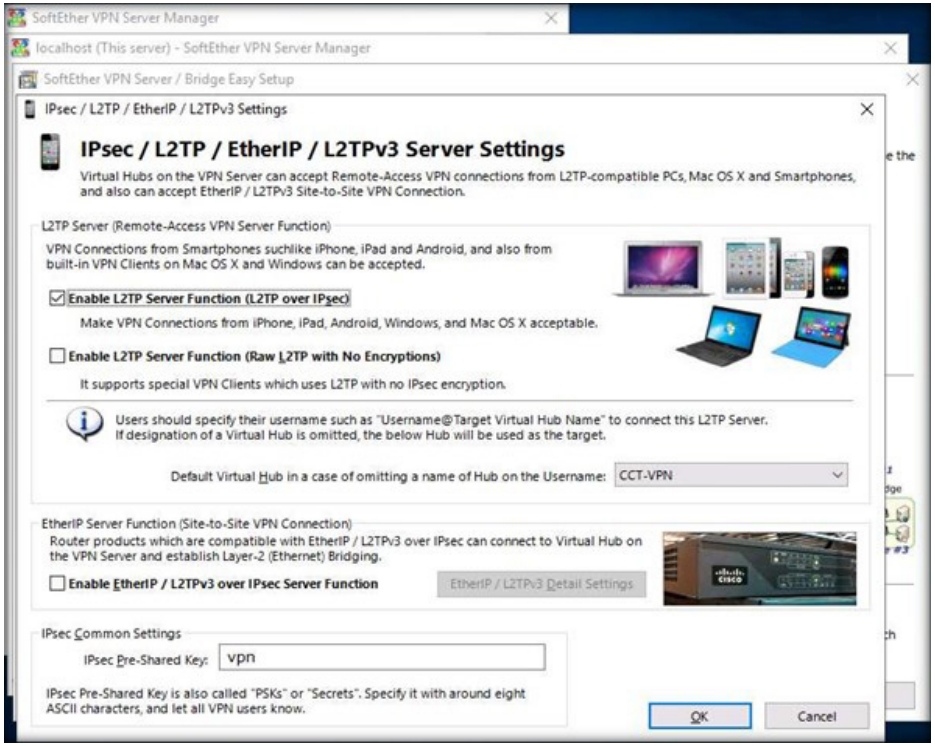


EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

15. The **Dynamic DNS Function** window appears. Click **Exit** to continue.

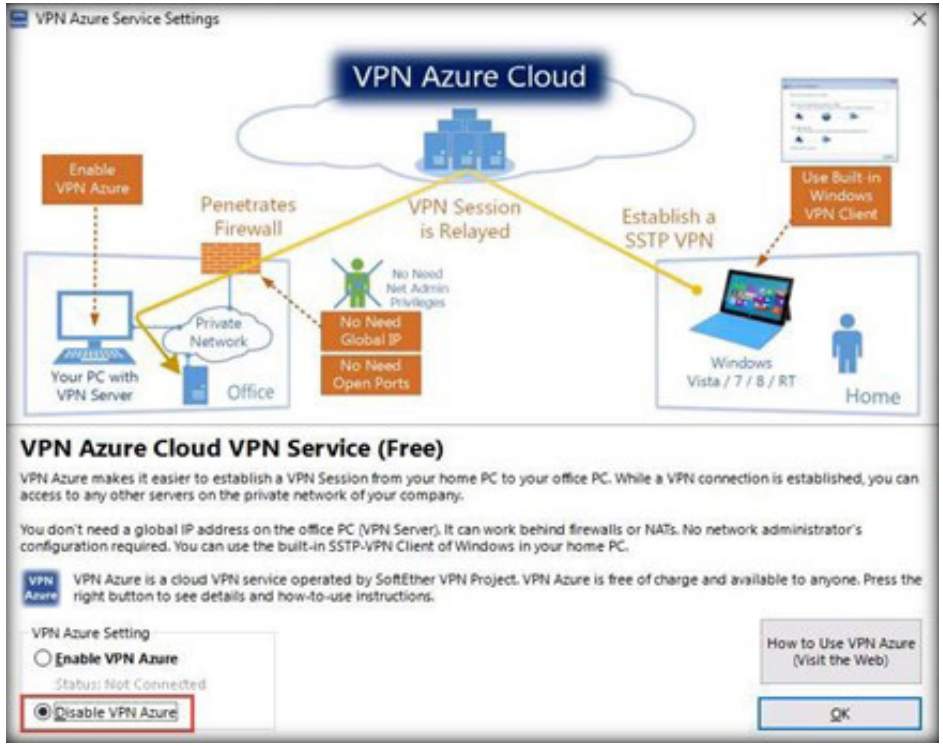
16. The **IPsec / L2TP / EtherIP / L2TPv3 Server Settings** window appears. Check **Enable L2TP Server Function (L2TP over IPsec)**. Retain the other settings as default and click **OK**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



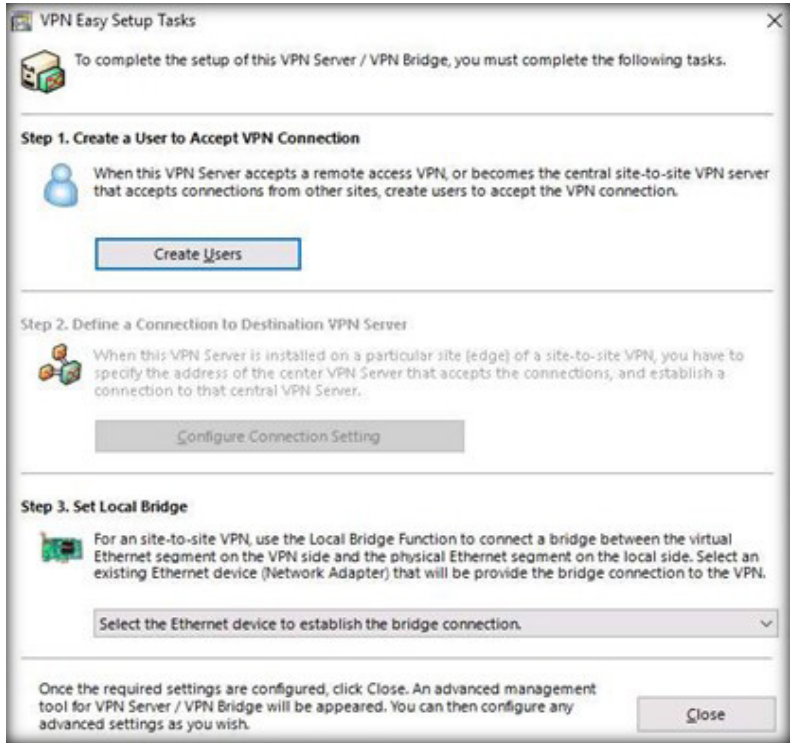
17. The **VPN Azure Service Settings** wizard appears. You can choose any option according to your organization network policy. In this exercise, we select the **Disable VPN Azure** radio button. Click **OK**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



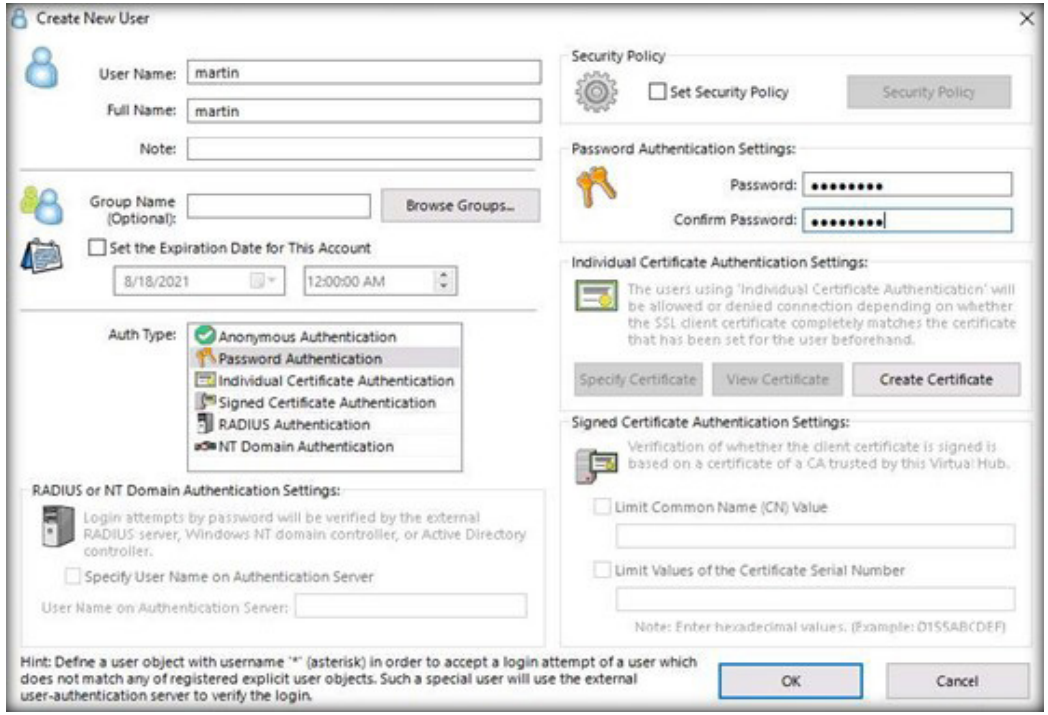
18. The **VPN Easy Setup Tasks** wizard appears; in this wizard, we create users who can access the organization network using VPN. To create new users, click **Create Users**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



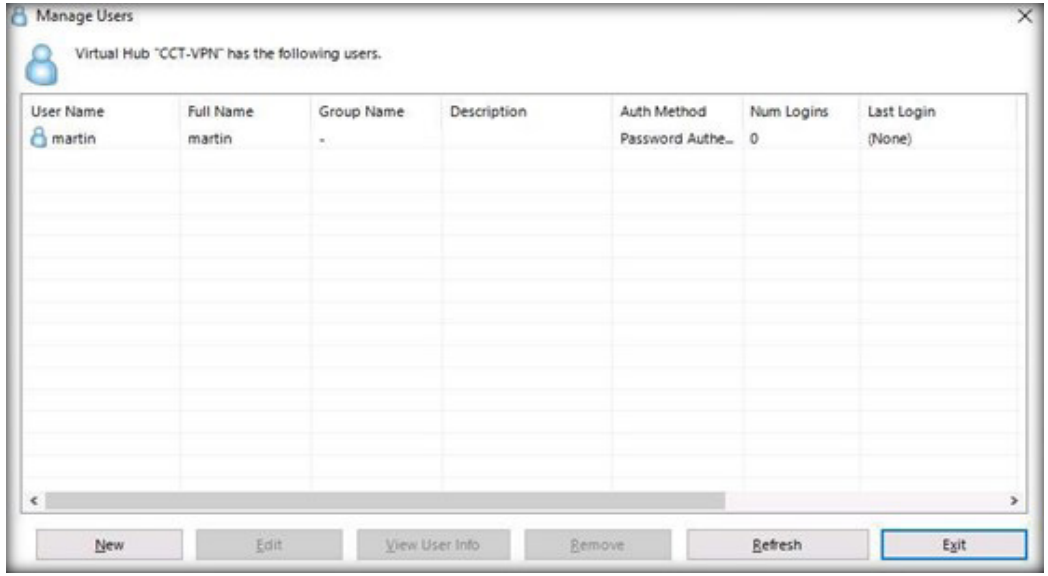
19. The **Create New User** wizard appears. Fill in the required details. As can be seen, we have created a new username **martin** and password **user@123**. Click **OK**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



20. A pop-up notifying that the user has been created appears. Click **OK**.

21. The **Manage Users** window appears. Here, you can create new users, edit created users, view user information, and remove users. Click the **Exit** button.

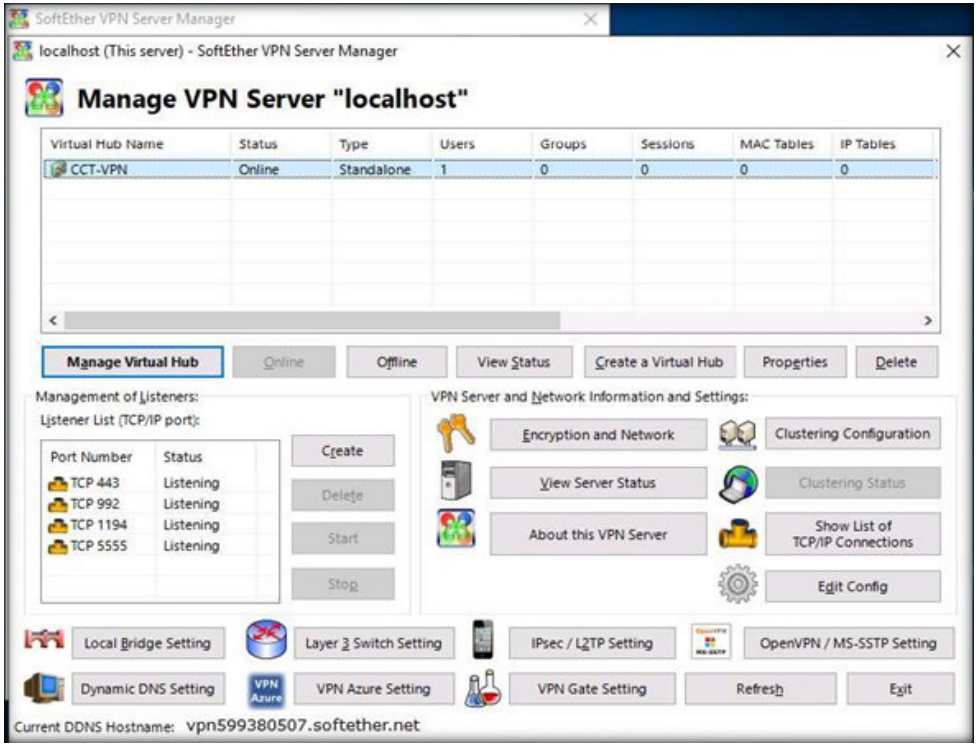


EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

22. The **VPN Easy Setup Tasks** wizard appears. Click **Close**.

23. The **Manage VPN Server** "localhost" dashboard appears. Here, you can see the connected users through the VPN network. You can also manage the VPN settings using different options on this dashboard.

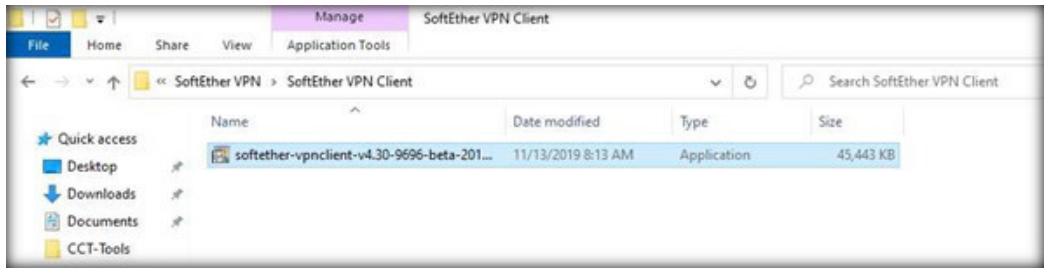
EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



24. Switch to the **Admin Machine-1** virtual machine.
Note: If you are not logged into the machine, then login with the credentials **Admin** and **admin@123**.

25. To install the **SoftEther VPN client**, navigate to **Z:\CCT-Tools\CCT Module 07 Network Security Controls - Technical Controls\SoftEther VPN\SoftEther VPN Client**.

26. Double-click **softether-vpnclient-v4.30-9696-beta-2019.07.08-windows-x86_x64-intel.exe**.



EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

Note: You can download the latest version of SoftEther VPN Client from **https://www.softether-download.com**. If you use the downloaded file, then the screenshots may not exactly match the version you will use.

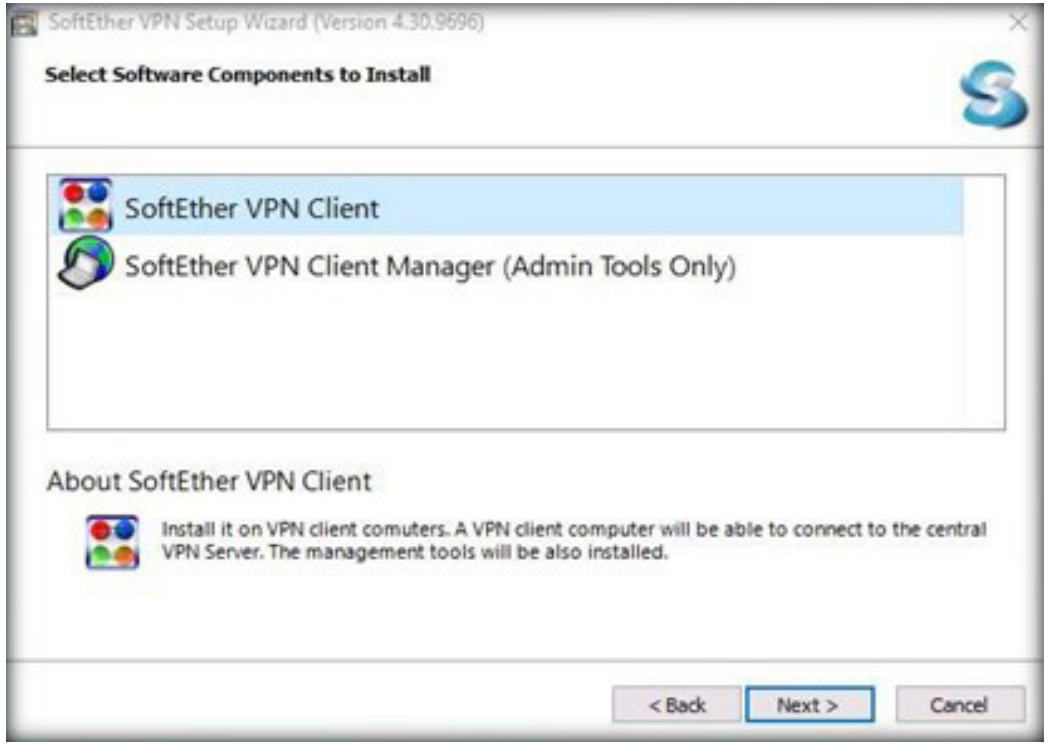
Note: If an **Open File - Security Warning** window appears, click **Run**.

27. The **SoftEther VPN Setup Wizard** appears. Click **Next**.

Note: If **User Account Control** window appears, click **Yes**.

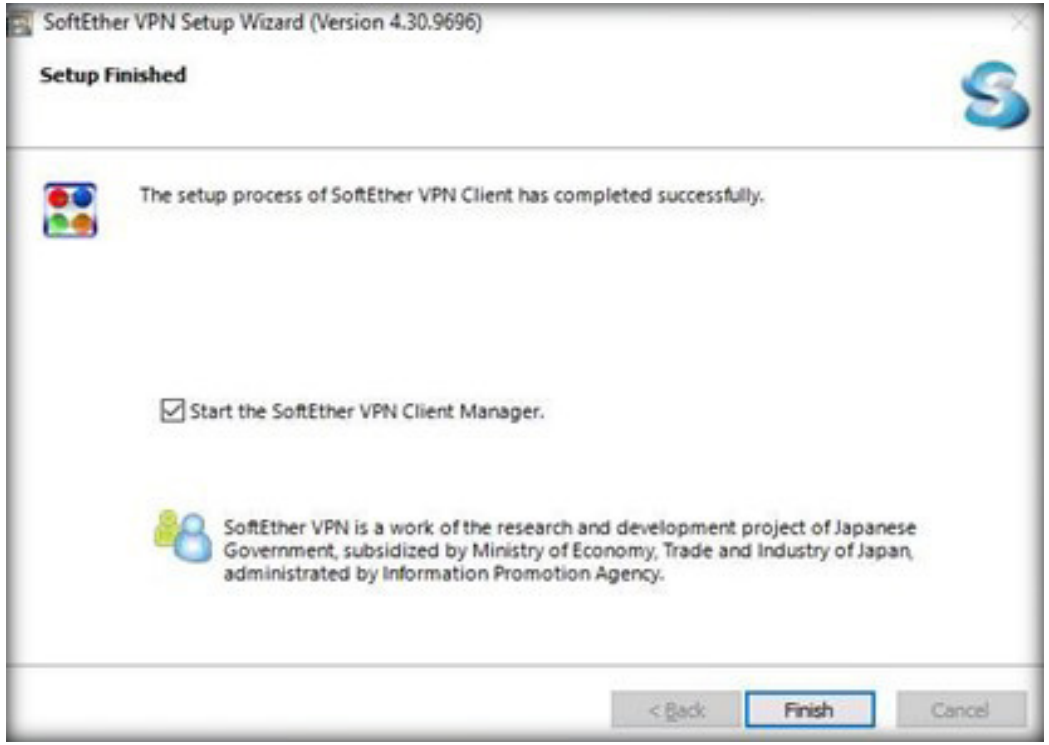
28. The **Select Software Components to Install** wizard appears. **Choose the SoftEther VPN Client**. Click **Next**.

EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



29. Follow the wizard-driven installation steps to complete the installation process. When the **Setup Finished** wizard appears, ensure that **Start the SoftEther VPN Client Manager** is checked to launch the application automatically. Click **Finish**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

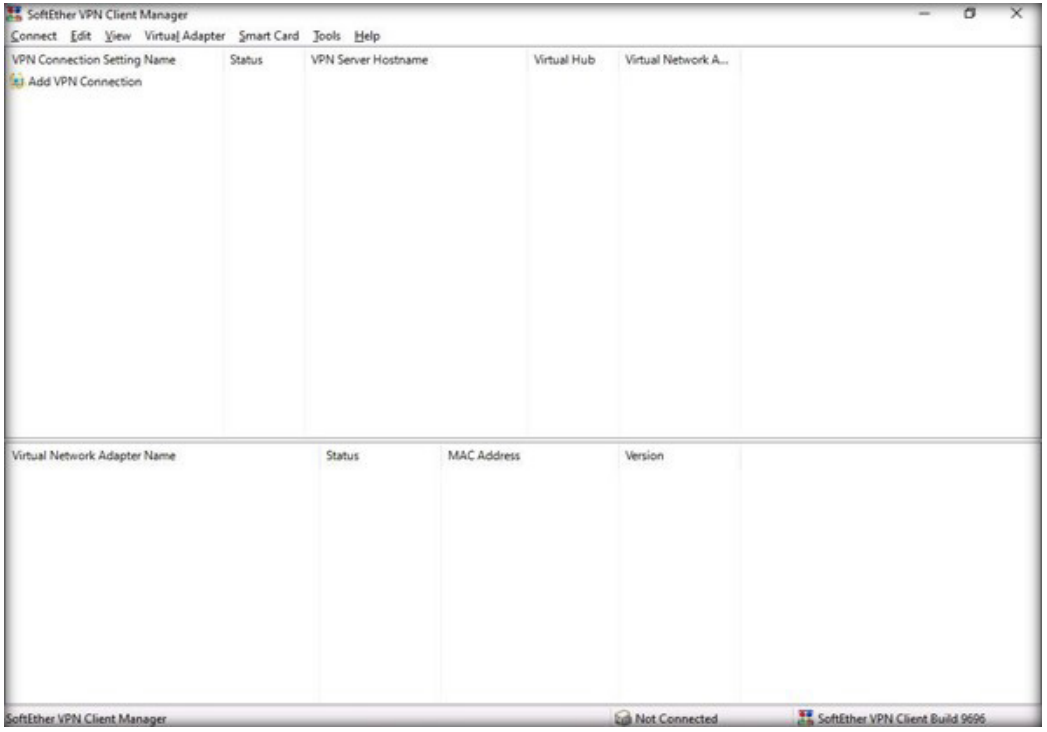


Note: Alternatively, you can also launch the application by double-clicking the shortcut icon on the desktop or from the Start menu installed apps.

30. The **SoftEther VPN Client Manager** window appears.

Note: If an **Update Available** pop-up appears, click on **Do Not Show this Message Again**.

EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



31. Double-click **Add VPN Connection** to add a system to the VPN network.

32. Before creating a VPN Connection Setting, we need to create a Virtual Network Adapter. When the **SoftEther VPN Client Manager** prompts to create a Virtual Network Adapter, click **Yes**.

EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

33. The **Create New Virtual Network Adapter** pop-up appears. Type the name in the **Virtual Network Adapter Name** field. Click **OK**. Retain the default settings.

Note: The Virtual Network Adapter Name should be VPN or should range from VPN2 to VPN127 as shown in the pop-up (you can create a maximum of 127 Virtual Network Adapters).

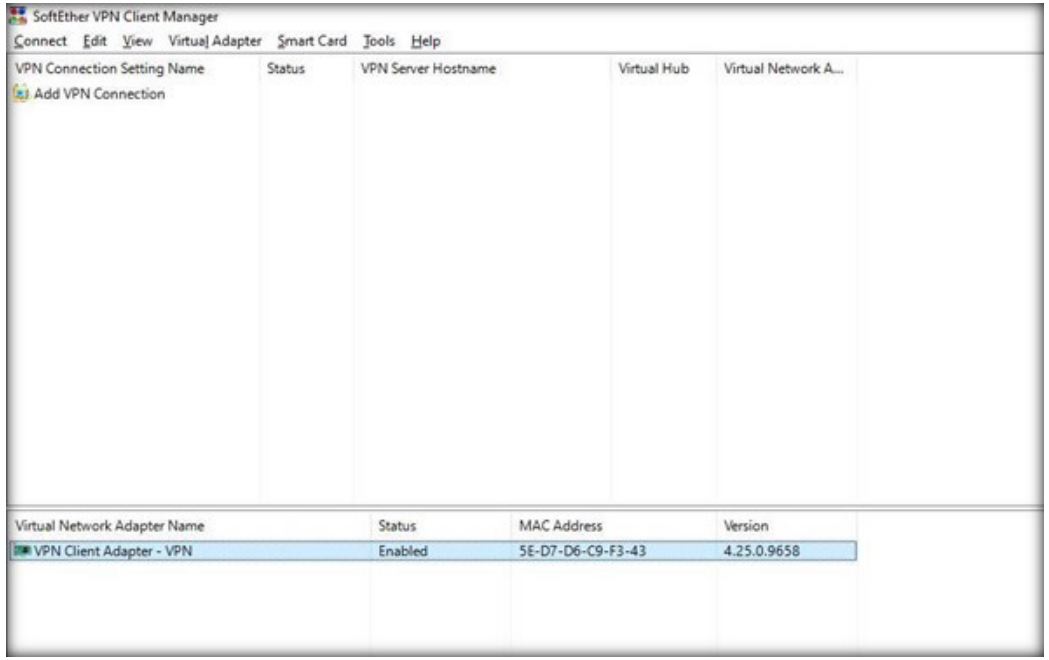
EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

34. The SoftEther VPN client will create a new **Virtual Network Adapter**. Wait until the process is completed.

35. The newly created **Virtual Network Adapter** can be seen in the lower pane of the **SoftEther VPN Client Manager** window with the assigned **Status, MAC Address, and Version**. In this exercise, the newly created Virtual Network Adapter is **VPN Client Adapter - VPN**.

Note: The MAC Address might differ in your lab environment.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



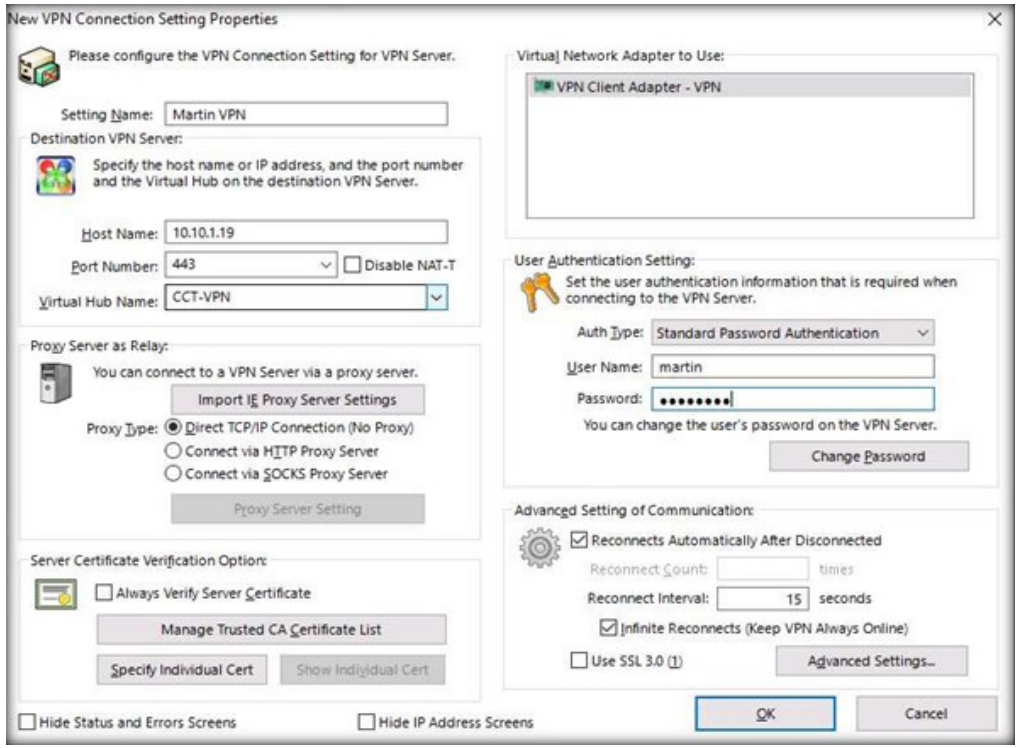
36. Next, we need to configure the adapter. Double-click on the newly created **Virtual Network Adapter**.

37. The **New VPN Connection Setting Properties** wizard appears.

38. In the **Setting Name** field, provide a name for the VPN Connection **[Martin VPN]**. Under the **Destination VPN Server** section, type your public IP in the **Host Name** field **[10.10.1.19]**. You can choose any port from the **Port Number** dropdown **[443]**. In the **Virtual Hub Name** field, choose the appropriate name. In this exercise, we have created a virtual hub name **CCT-VPN** in **Step 14**. If you have created multiple virtual hubs, choose the appropriate one. Retain the other default settings.

39. On the right side in the **User Authentication Setting:**, type the username and password of the user that you have created in **Step 19**. In this exercise, the username is **martin** and the password is **user@123**. Click **OK** and retain the other default settings.

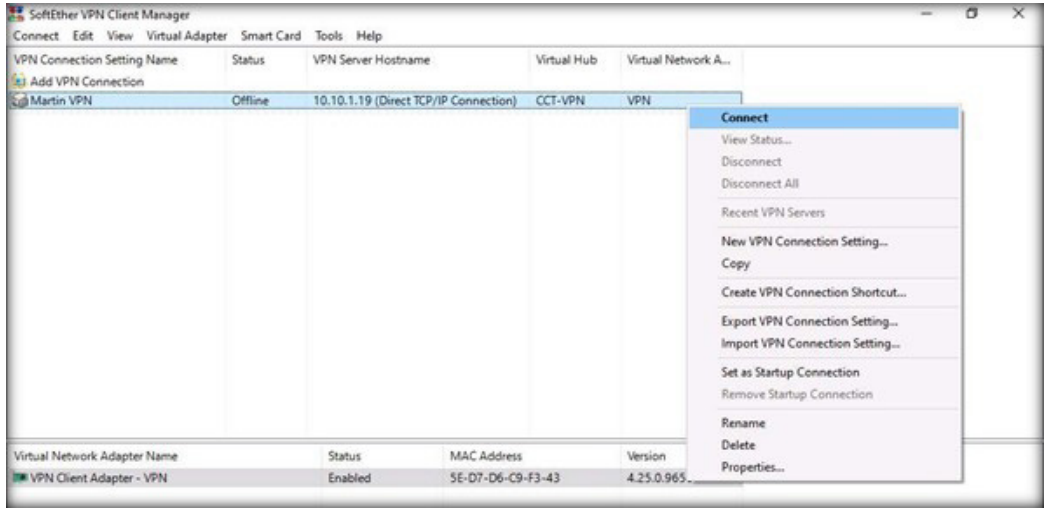
EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



40. A newly created VPN connection appears in the **SoftEther VPN Client Manager** window with the status showing as **Offline**.

41. Right-click **Martin VPN** and select **Connect** from the context menu to connect the organization network through the VPN.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

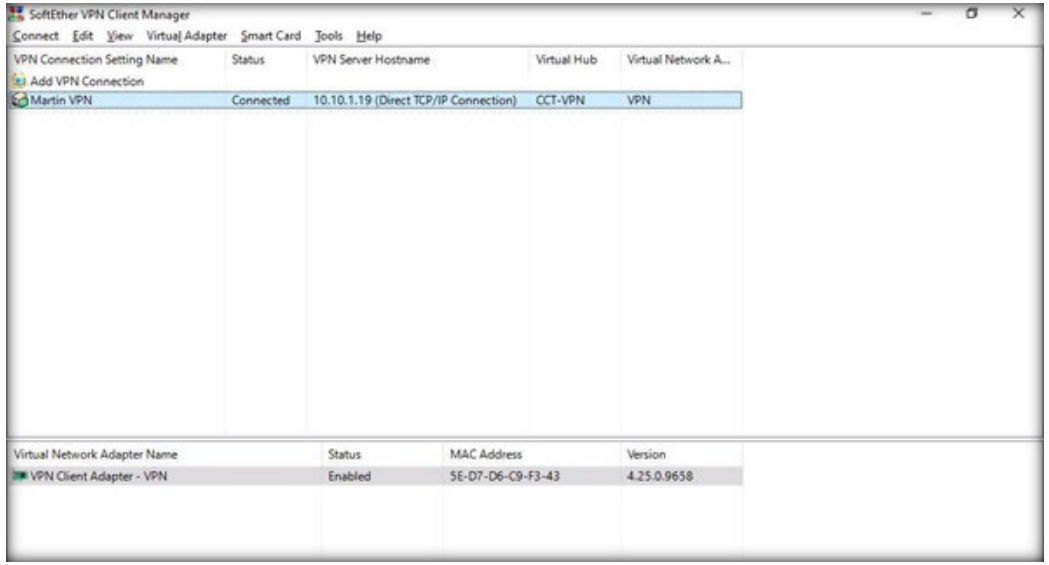


Note: If the **Login to 10.10.1.19** pop-up window appears and if it keeps connecting, type the Username and Password. (Here, we use the username as **martin** and password as **user@123** used in the **Step 40**).

42. The **Connected to VPN Server** pop-up appears, requesting to assign an IP. Wait until the process is completed.

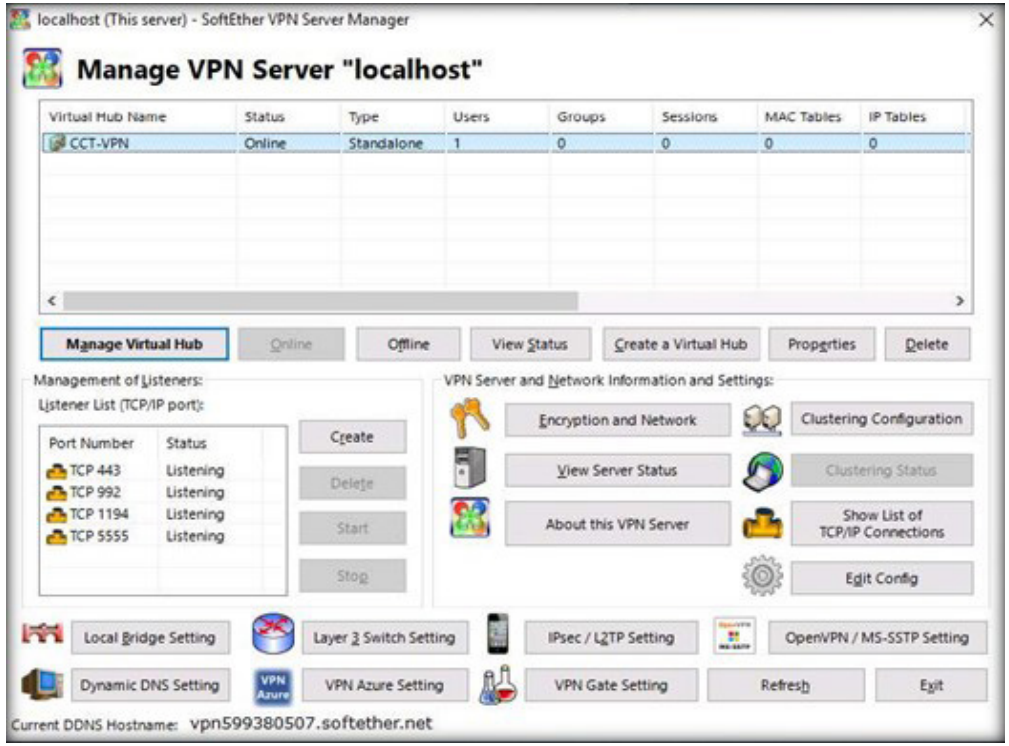
43. The status of the **VPN changes to Connected from Offline**.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



44. Switch back to the **AD Domain Controller** virtual machine, where the **SoftEther VPN Server** is installed. See the active sessions using the VPN. You can see **0** Sessions.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



45. Click the **Refresh** button. You can see the active sessions that are accessed by the users.

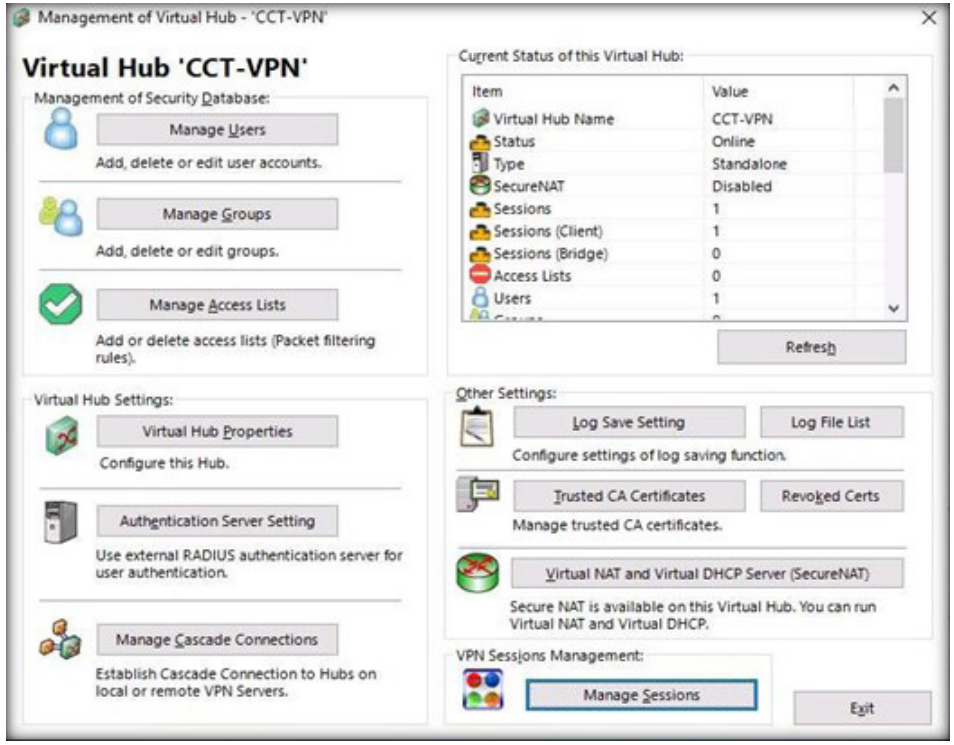
EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

46. To view and manage the sessions; click **Manage Virtual Hub** button or double-click the available VPN Hub in the dashboard. The **Management of Virtual Hub – (Virtual Hub Name)** window appears.

47. Traverse through all the required options available in the wizard. You can manage the sessions and settings of the VPN Network.

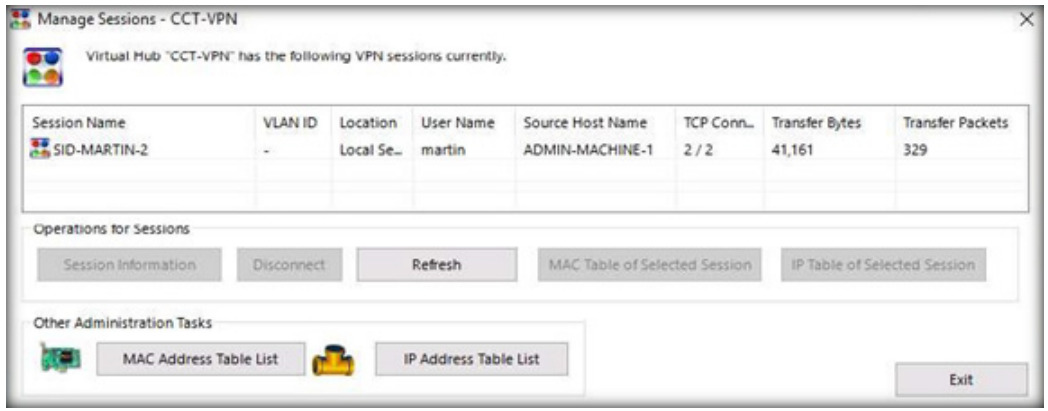
48. For instance, to access the **Manage Sessions** option, click the **Manage Sessions** button.

EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



49. The **Manage Sessions** window appears, where you can see connected users through the VPN Network. You can use different options to manage the VPN users.

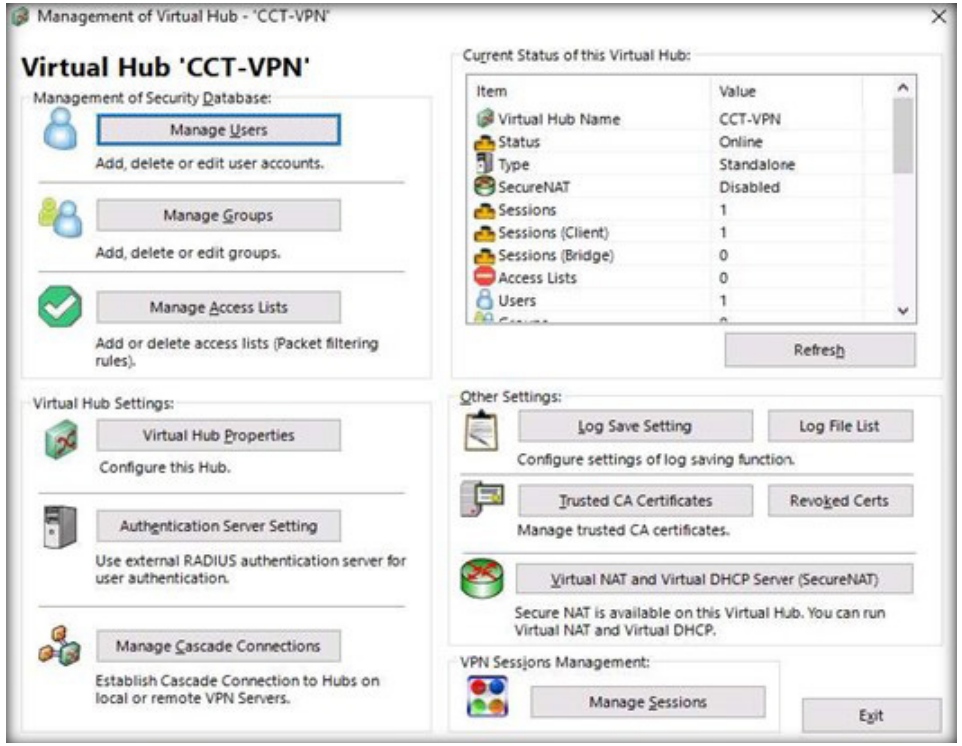
50. Click on **Exit** to close the **Manage Sessions** window.



EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

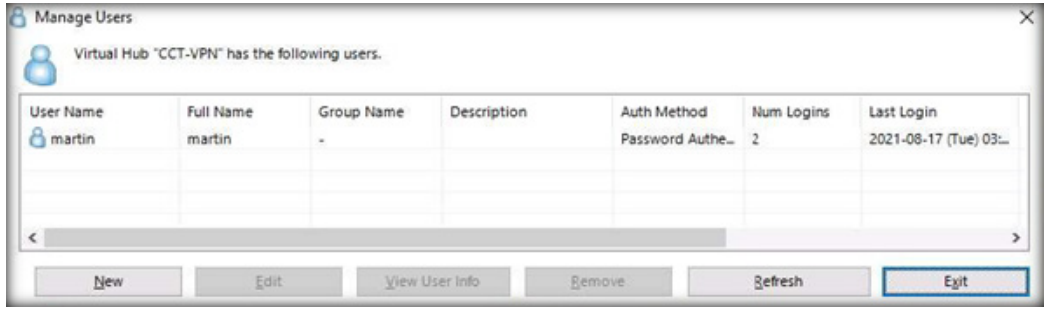
51. Now in the **Management of Virtual Hub – (Virtual Hub Name)** window, click the **Manage Users** button.

EXERCISE 8: ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN



52. The **Manage Users** window appears, where you can see the details of the users.

53. Click on **Exit** to close the **Manage Users** window to return to Management of **Virtual Hub – (Virtual Hub Name)** window.



EXERCISE 8:
ESTABLISH VIRTUAL PRIVATE NETWORK CONNECTION USING SOFTETHER VPN

54. In the same way you can explore different options in the **Management of Virtual Hub – (Virtual Hub Name)** window like **Manage Groups, Manage Access** lists etc.

55. Close all the open windows in both machines.

56. Turn off the **AD Domain Controller** virtual machine.

EXERCISE 9: **SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY**

Anti-virus software is a tool or program that is designed to identify and prevent malicious Trojans or malware from infecting computer systems or electronic devices.

LAB SCENARIO

An attacker uses malware to commit online fraud or theft. Thus, the use of antivirus or anti-malware software is recommended to help detect malware, remove it, and repair any damage it might cause.

A security professional must have the required knowledge to scan the systems in the network with Antivirus or Anti-malware software to remove any unwanted or malicious files which can be harmful to the system and overall network security.

LAB OBJECTIVE

This lab will demonstrate how to perform a scan on a system using Kaspersky Internet Security.

OVERVIEW OF ANTI-VIRUS

Anti-virus systems and threat intelligence platforms use Indicators of Compromise (IoCs) to spot and stop malicious activities at an initial stage. Examples for IoCs include using specific registry entries, domain names of botnet command-and-control (C&C) servers, hashes of malware files, virus signatures, and Internet Protocol (IP) addresses.

LAB TASKS

Note: Ensure that **Admin Machine-1, Web Server** and **PfSense Firewall** virtual machines are running.

1. Switch to the **Admin Machine-1** virtual machine.

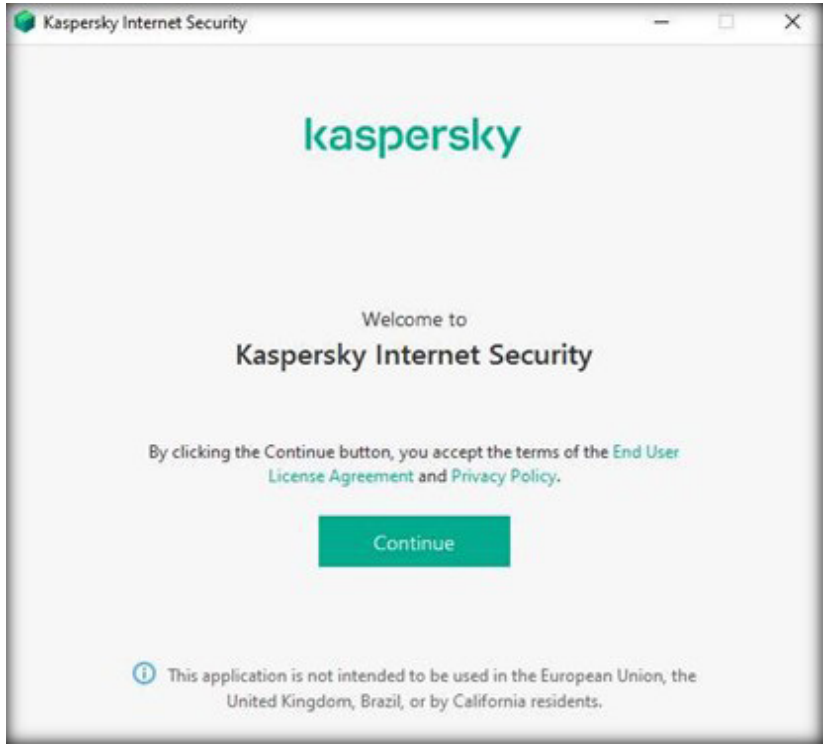
2. To install the **Kaspersky Internet Security**, navigate to **Z:\CCT-Tools\CCT Module 07 Network Security Controls - Technical Controls\Kaspersky Internet Security**.

3. Double-click **Kis21.3.10.391en_26096.exe**.

   Note: You can download the latest version of **Kaspersky Internet Security** from **https://www.kaspersky.com**. If you use the downloaded file, the screenshots in the lab may vary.

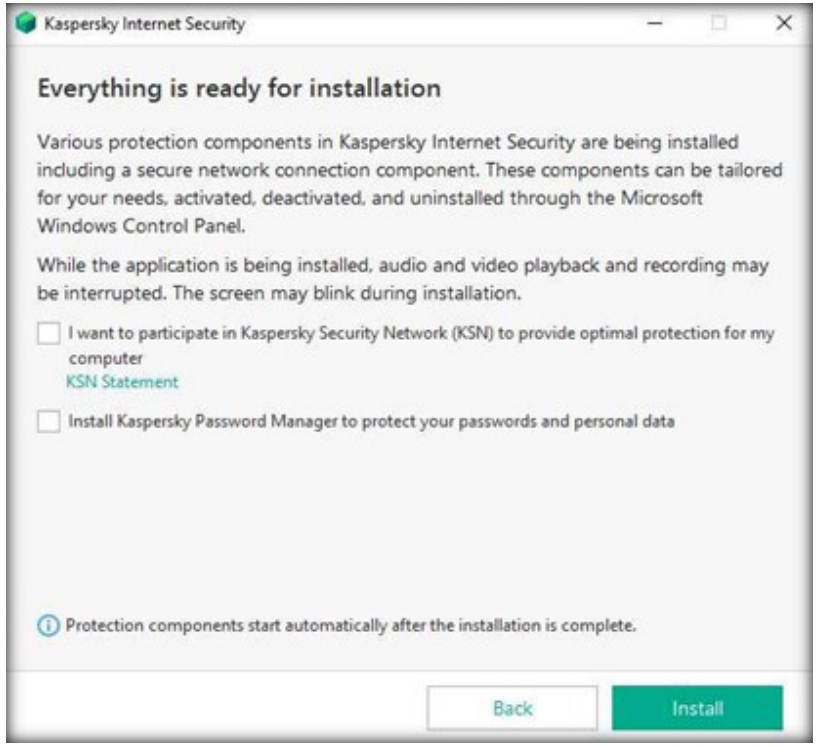
4. The **Kaspersky Internet Security** window appears. After the connection to the server has been established, the **Continue** button appears, click on it.

EXERCISE 9: SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY



5. The **Everything is ready for installation** wizard appears, uncheck both the checkboxes and click Install button.

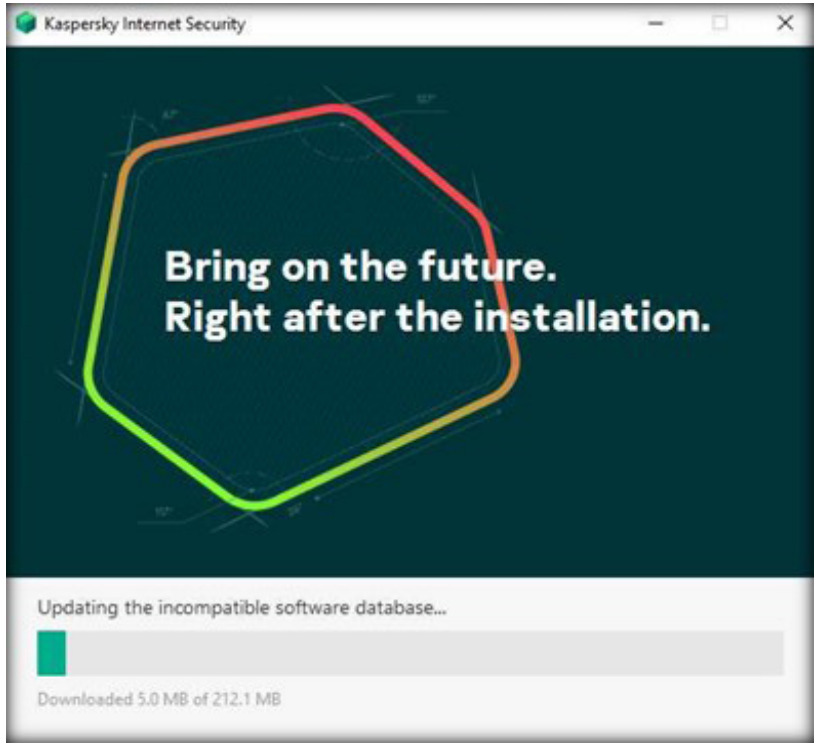
EXERCISE 9:
SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY



6. The **User Account Control** window appears, click **Yes**.

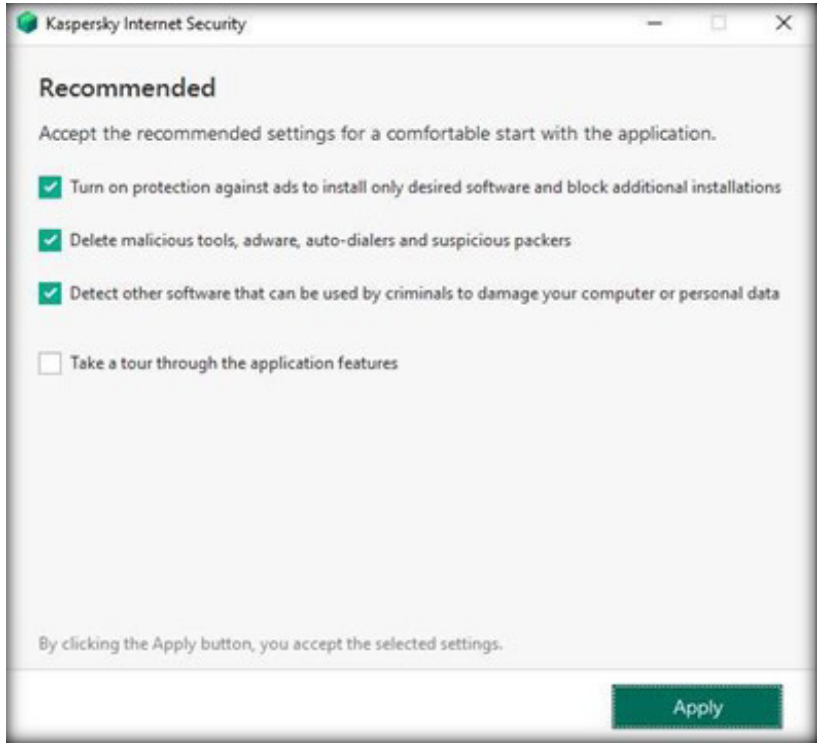
7. Application begins downloading, wait for it to finish. It will take approximately 5 minutes for the download to finish.

EXERCISE 9:
SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY

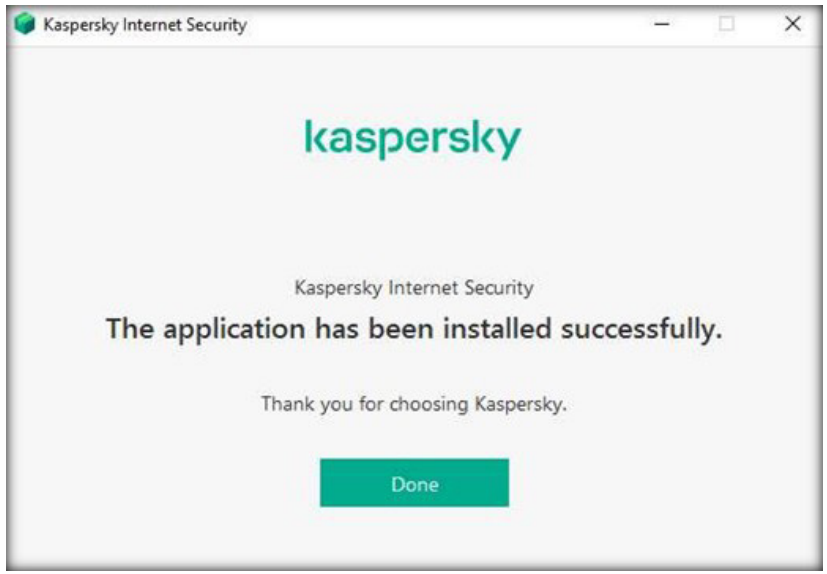


8. After the application finishes downloading, the **Recommended** wizard appears. Uncheck **Take a tour through the application features** checkbox and click **Apply**.

EXERCISE 9:
SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY

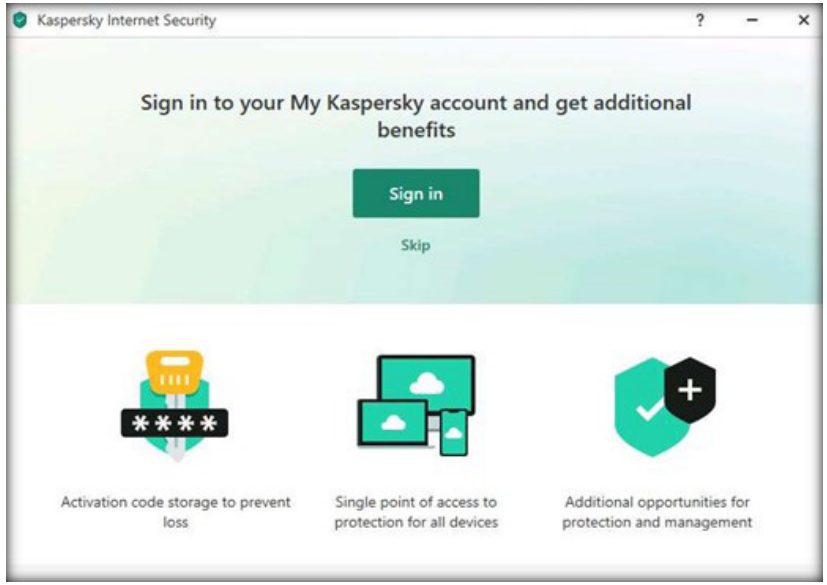


9. The application is installed successfully, click **Done** button.



EXERCISE 9: SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY

10. Sign in wizard appears, click **Skip** to skip the sign in process.
    Note: If **Kaspersky VPN** window appears, close it.

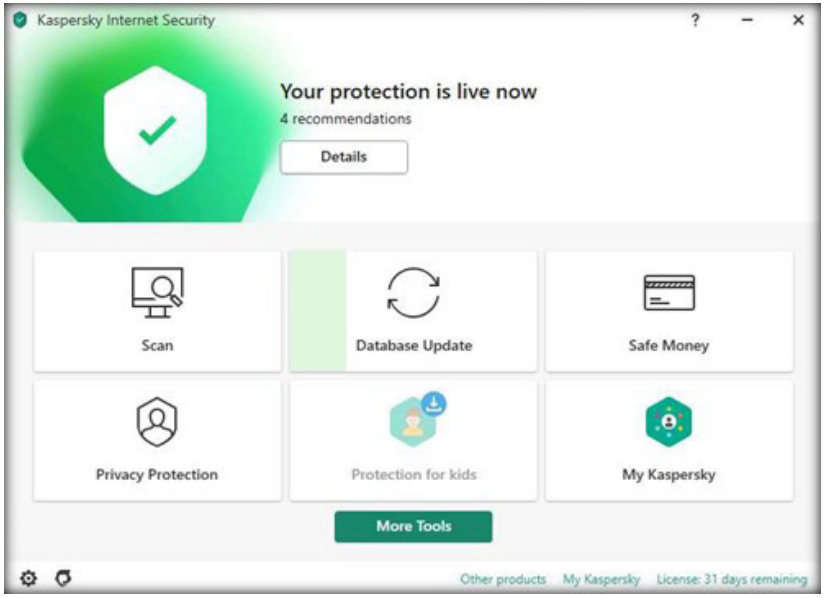


EXERCISE 9: SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY

11. The **Activation completed successfully** wizard appears, click **Done**.

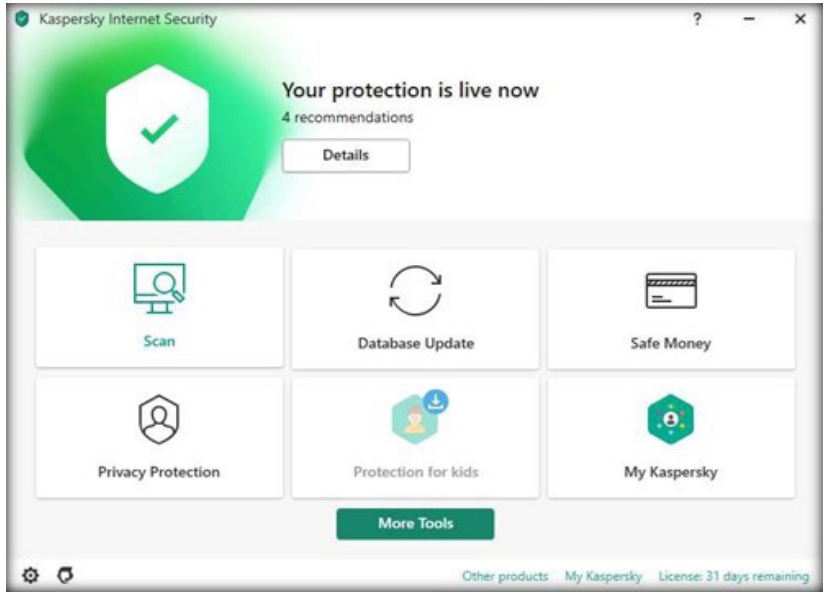
12. The **Kaspersky** main window appears, allow **Database Update** to finish installing updates.
    Note: If database update is not started automatically, click on **Database Update** and in the next window click on Run update.
    Note: The status will be indicated in green color.

EXERCISE 9:
SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY



13. Now, click the **Scan** button to scan the system for malicious files.

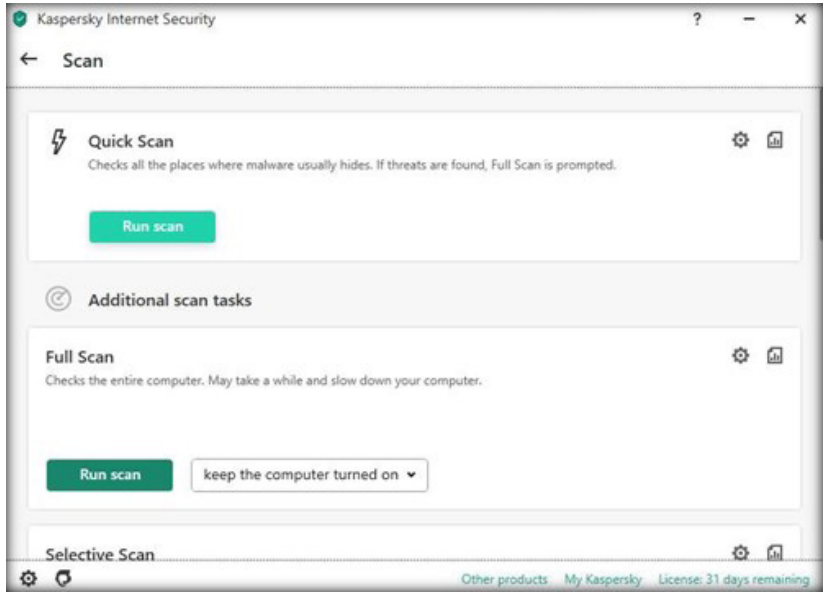
EXERCISE 9:
SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY



14. The **Scan** wizard appears. Here, you will perform a quick scan.

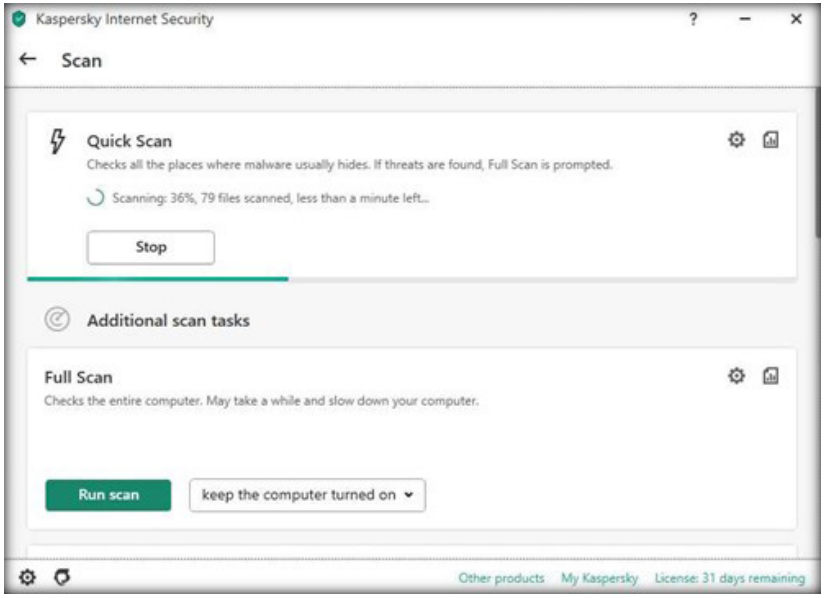
15. To do so, click **Run scan** button under the **Quick Scan** section.

EXERCISE 9:
SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY



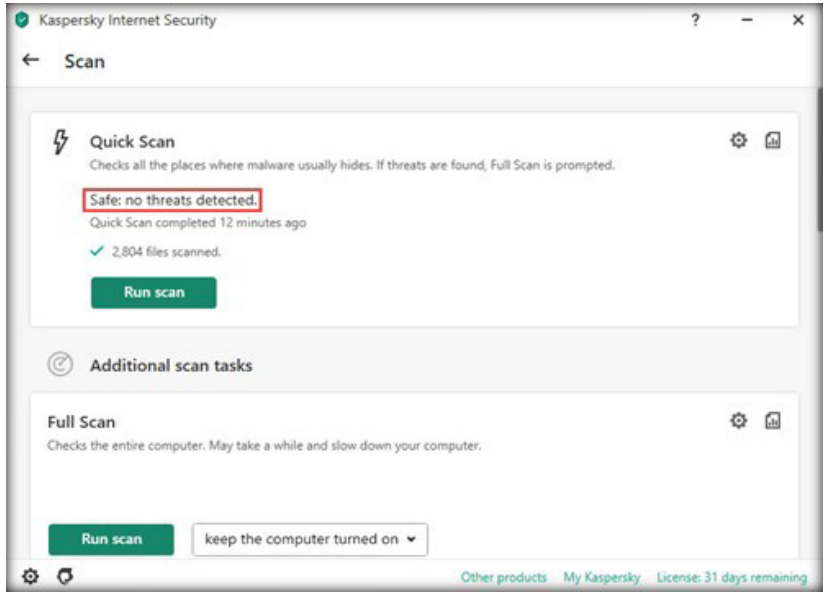
16. The scanning process initializes, the scan status will appears above the **Stop** button, you will have to wait for the status to reach **100%**.
    Note: Scanning process will take approximately 5 minutes to finish.

EXERCISE 9:
SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY



17. After the completion of scan, you can observe the status as **Safe:no threats detected** indicating that the system is free from viruses and malicious files.

EXERCISE 9: SCAN SYSTEM FOR VIRUSES USING KASPERSKY INTERNET SECURITY



18. Scroll-down in the **Scan** wizard. As you so do, you will be able to see different types of scans that can be performed on the system. The scanning may vary depending on the type of scan being performed.

19. Similarly, you can navigate back to the main window of **Kaspersky** and explore the other tools offered by application.

20. This concludes the demonstration of scanning a system using Kaspersky Internet Security.

21. Close all open windows.

22. Turn off **Admin Machine-1** and **PfSense Firewall** virtual machines.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