SSH Brute Force Attack using Metasploit with Threat Detection via Wazuh

This project demonstrates a brute-force attack on an SSH service using Metasploit, a penetration testing framework. The goal is to understand how brute-force attacks work, how attackers can exploit weak SSH credentials, and how to monitor and detect such attacks using a security tool like Wazuh.

What is SSH?

SSH (Secure Shell) is a cryptographic network protocol used to securely connect to remote systems.

- Provides encrypted communication over insecure networks.
- Commonly used for remote login and secure file transfer.
- Default port: 22.

How SSH Works

1. The client sends a connection request to the server on port 22.
2. The server asks for a username and password (or key-based authentication).
3. If credentials are valid, the connection is established securely.
4. Once authenticated, the client can execute commands or transfer files.

Why SSH is used?

- Provides confidentiality and integrity of remote sessions.
- Protects against eavesdropping and MITM attacks.
- However, if weak passwords are used, attackers can exploit SSH using brute-force

What is Metasploit?

Metasploit is a popular penetration testing framework used by cybersecurity professionals, ethical hackers, and attackers to test and exploit vulnerabilities in computer systems. It is pre-installed in Kali Linux and provides hundreds of ready-made exploits, payloads, and auxiliary modules.

Key Features of Metasploit

- Exploitation Framework → Provides modules to exploit vulnerabilities in services, applications, and operating systems.
- Auxiliary Modules → Includes scanners, brute-force tools, and information-gathering utilities (like the SSH login scanner you used).

- Payloads → Allow attackers to gain control of a system (e.g., reverse shells, Meterpreter sessions).
- Post-Exploitation Tools → Enable further actions after gaining access, such as privilege escalation, data extraction, or persistence.
- Community & Updates → Regularly updated with the latest exploits, making it a go-to tool for penetration testing.

Why Metasploit is Used

- Automates common attack techniques like brute-force, scanning, and exploitation.
- Makes penetration testing faster and more systematic.
- Helps security professionals simulate real-world attacks to test defenses.
- Widely supported and integrated with other security tools.

Project Objective:

To demonstrate an SSH brute-force attack against a Linux victim machine using Metasploit, identify valid credentials, and monitor the attack using Wazuh.

Tools and Environment Setup

- Attacker Machine: Kali Linux (IP: 192.168.1.69) running Metasploit.
- Victim Machine: Ubuntu Linux (IP: 192.168.1.71) with SSH enabled.
- Monitoring Tool: Wazuh for security event monitoring and detection.

Step-by-Step Process

1. Setting Up the Environment

- Ensure the victim machine is running an SSH service on port 22.
- Deploy Wazuh for log monitoring and threat detection.
- Use Kali Linux as the attacking machine.

2. Preparing Credential Files

- user.txt → contains possible usernames.
- passwords.txt → contains possible passwords.

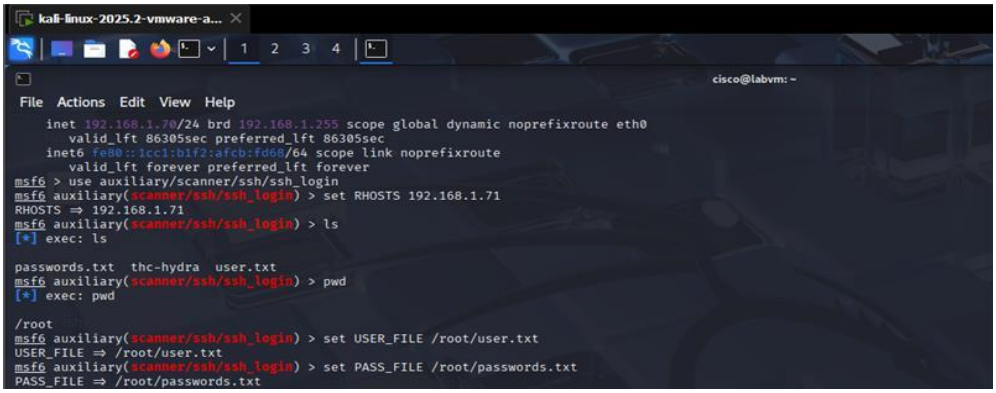
3. Running the Metasploit Attack

Here is the step-by-step breakdown of the commands you used in msfconsole:

1. use auxiliary/scanner/ssh/ssh_login
    - Loads the SSH brute-force module in Metasploit.

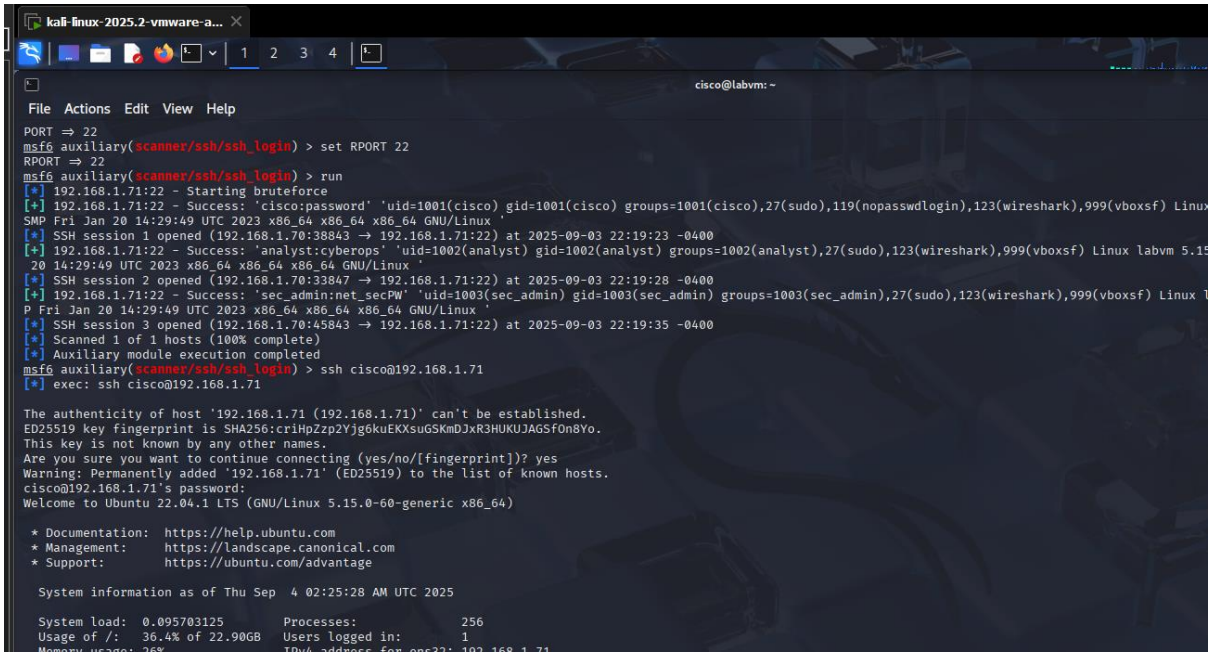
- This module is designed to try multiple username and password combinations against an SSH service.

2. set RHOSTS 192.168.1.71
    - Sets the target victim machine's IP address (the Linux machine running SSH).
    - Here, 192.168.1.71 is the victim system.
3. ls and pwd
    - These are basic Linux commands executed from within msfconsole.
    - ls → lists files in the current directory (to check if username/password files exist).
    - pwd → shows the current working directory (/root in this case).

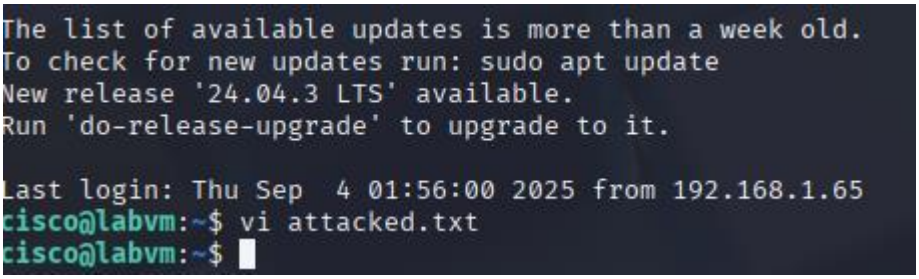


4. set USER_FILE /root/user.txt
    - Tells Metasploit where to find the list of possible usernames.
    - The file user.txt contains a list of usernames that the attacker will try (e.g., root, admin, cisco).
5. set PASS_FILE /root/passwords.txt
    - Specifies the list of possible passwords to test.
    - passwords.txt contains a collection of common or guessed passwords (e.g., 1234, password, cisco123).
6. set RPORT 22
    - Defines the port number for the SSH service.
    - SSH runs on port 22 by default, so this confirms the module will attack the correct service.
7. run
    - Starts the brute-force attack.

- Metasploit begins testing all possible username-password combinations from user.txt and passwords.txt.
- When a valid pair is found, Metasploit displays a success message (e.g., Success: 'cisco:password123').



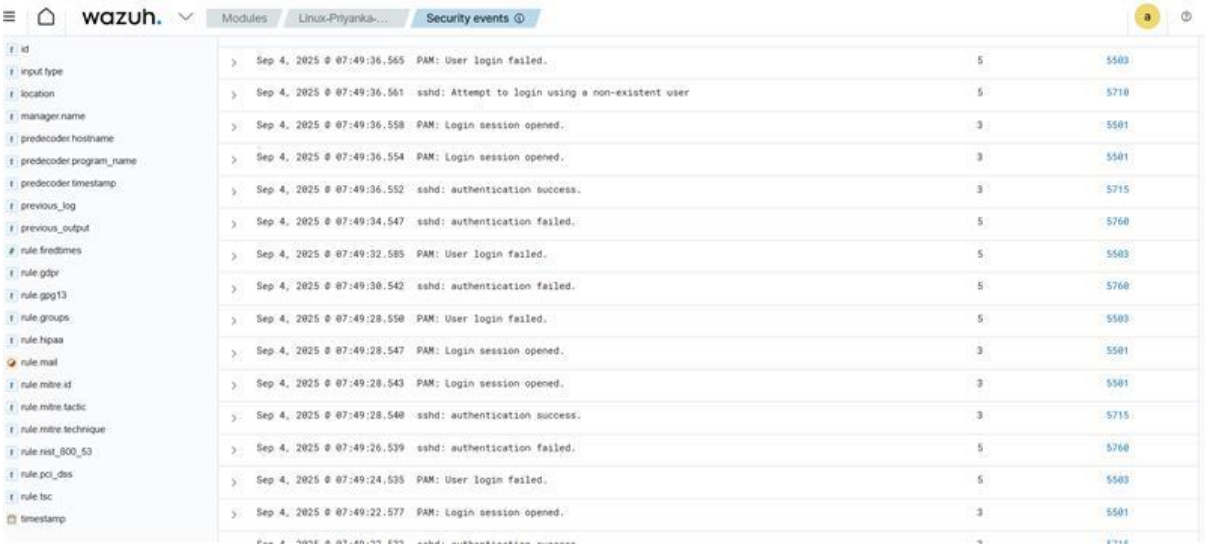
8. ssh cisco@192.168.1.71
   - After finding valid credentials (cisco as username and its password), the attacker uses a standard SSH client to log into the victim machine manually.
   - This confirms that the brute-force attack was successful.
   - At this point, the attacker has interactive access to the victim machine.
9. vi attacked.txt
   - Once logged into the victim system, the attacker uses the vi editor to create a new file named attacked.txt.
   - This step is used as proof-of-access:
     - It shows the attacker was able to log in successfully.
     - The file may contain a message like “your machine has been attacked”.
   - In real-world attacks, instead of leaving a harmless file, attackers could install malware, backdoors, or exfiltrate data.



Threat Detection

1. Wazuh SIEM Tool

Wazuh monitored SSH logs and generated alerts:



- **Multiple Failed SSH Login Attempts** → detected brute force activity.
- **SSH Authentication Success** → indicates attacker finally logged in.
- **PAM Session Opened/Closed** → logs active user sessions and terminations.

2. Attack Evidence in Logs

- Continuous "Failed password" events → brute force attempts.
- Successful login event from attacker IP (192.168.1.69).
- Alerts triggered in Wazuh dashboard.

Summary:

This project demonstrates an SSH brute-force attack using Metasploit on a victim Linux machine. The attacker used username and password lists to guess valid credentials and successfully logged in via SSH. A proof-of-access file (attacked.txt) was created on the victim system. The attack highlights the risk of weak SSH passwords and the importance of monitoring with tools like Wazuh to detect brute-force attempts and unauthorized logins.

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Project Title: SSH Brute Force Attack using Metasploit with Monitoring via Wazuh.