Network Research Project: Anonymous Enumeration Tool

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1. Introduction

This document serves as a technical guide for the **Anonymous Enumeration Tool** script. The primary function of this tool is to perform Nmap and Whois network scans against a user-specified IP target.

The script is distinct in its adherence to two critical security protocols:

1. **Anonymity Verification:** It automatically verifies that the host machine is not exposing an Israeli IP address. If an Israeli IP is detected, the script utilizes the **Nipe** tool to mask the address before proceeding.
2. **Privilege Enforcement:** The script enforces a root privilege check, requiring execution via sudo to ensure full functionality.

Data Collection

The tool aggregates the following data from the remote server, saving it to local files:

- **Whois Scan:** Domain and IP registration details (saved to whois_data.txt).
- **Nmap Scan:** Network discovery and security auditing data (saved to nmap_data.txt).
- **Audit Log:** A comprehensive documentation of all actions taken during the session (saved to scan_log.txt).
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2. Target Audience

This guide and tool are designed for:

- **Cybersecurity Students:** Individuals enrolled in cyber courses requiring network analysis tools.
- **Security Enthusiasts:** Users seeking to gather information or gain experience in network scanning environments.
- **Automation Seekers:** Users looking to automate the setup of security tools, anonymity checks, and remote server scanning.

3. Requirements

To successfully execute this script, the following requirements must be met:

1. **Operating System:** Kali Linux (VM or native OS) to support apt package management.
2. **Permissions:** Root/Sudo privileges are mandatory for tool installation and network operations.
3. **Connectivity:** An active internet connection is required for downloading dependencies (Nipe, etc.) and contacting remote servers.
4. **Target Environment:** A secondary machine or remote server (e.g., VPS or Kali VM) with valid SSH credentials (IP, Username, Password).

4. Operational Guide

Step 1: Execution

The script must be initiated with elevated privileges. **Command:**

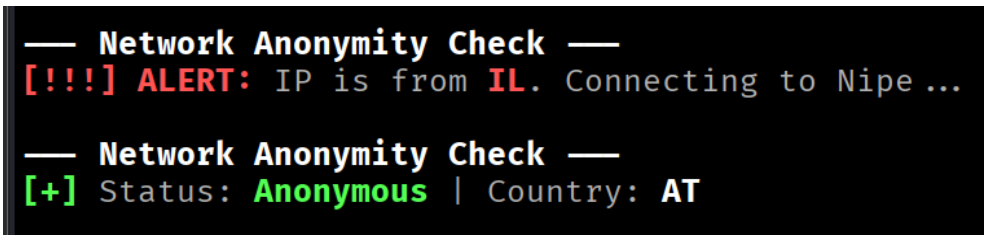
```
┌──(kali㉿kali)-[/var/run/vmblock-fuse/blockdir/o6YTVI]
└─$ sudo ./Network_Research_Anonymous_Enumeration.sh
```

Step 2: Automated Initialization

Upon execution, the script prompts for the sudo password and begins the initialization process. It automatically verifies the presence of required dependencies: Nipe, nmap, geoip-bin, sshpass, and figlet. Missing tools are installed automatically.

Step 3: Anonymity Enforcement

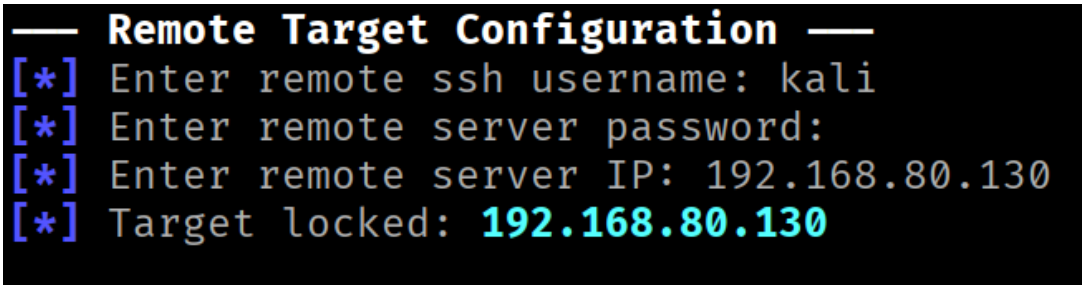
The script analyzes the user's public IP. If the origin is identified as Israel ("IL"), the system triggers an alert and activates **Nipe** to reroute traffic. It recursively checks the IP until anonymity is confirmed.



Step 4: Target Configuration

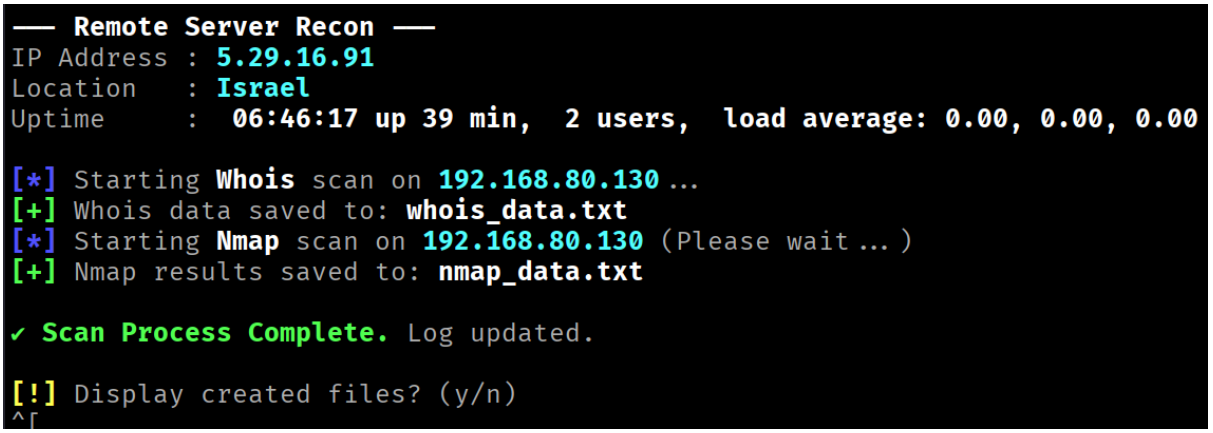
Once the environment is secure, the user is prompted to input the target parameters:

1. **Username:** The SSH username for the remote server.
2. **Password:** The SSH password.
3. **Target IP:** The public IP address of the server to be scanned.



Step 5: Completion & Reporting

The script establishes a connection to the target, executes the scans, and saves the outputs locally. Upon completion, the user is given the option to display the generated file contents directly in the terminal.



5. Purpose & Security

The tool transforms a complex, manual workflow into a single automated execution, adhering to two main security principles:

1. **Attacker Anonymity:** Ensures the operator's true public IP is masked via Nipe before any engagement.
2. **Audit Trail & Data Integrity:** Generates a reliable audit trail (scan_log.txt) alongside raw data files (whois_data.txt, nmap_data.txt), which is essential for after action review.

6. Technical Analysis

The script relies on five core functions to manage the workflow:

1. Function: ROOT

Validates execution privileges**:** Checks if the current user is "root". If not, the script terminates immediately. High privileges are required for package installation and network interface manipulation.

```
#1. Installations and Anonymity Check
function ROOT()
{
    if [ "$(whoami)" == "root" ]
    then
        echo -e "${OK} User is ${BOLD}root${NC}"
    else
        echo -e "${ERR} You are not root, exiting..."
        exit
    fi
}

# Banner in Cyan
echo -e "${CYAN}$(figlet "Anonymous Scan")${NC}"
echo -e "${BLUE}:: Automated Enumeration & Anonymity Tool ::${NC}"
echo ""

#3.2 Create a log
LOG_FILE="scan_log.txt"

log_message() {
    echo "[$(date '+%Y-%m-%d %H:%M:%S')] - $1" >> "$LOG_FILE"
}
```

2. Function: INSTALL

Purpose: Ensures all essential tools are installed**:**

- **Nipe Check:** Searches for the nipe directory using find. If absent, it clones the repository from GitHub and installs dependencies.

- **Package Loop:** Iterates through a list of tools (nmap, geoip-bin, etc.). It utilizes dpkg to check installation status. If a package is missing, it runs apt install silently, redirecting standard output and errors to /dev/null to maintain a clean interface.

```
function INSTALL() {
    echo -e "${BOLD}--- Checking Dependencies ---${NC}"

  if [ ! -z "$(find / -type d -name "nipe" 2>/dev/null | head -n 1)" ]
   then
        echo -e "${OK} Nipe directory found."
    else
        echo -e "${WARN} Nipe is not installed. Starting installation..."

        echo -e "${INFO} Installing tools: ${WHITE}git, perl${NC}"
        sudo apt-get update -y > /dev/null 2>&1
        sudo apt-get install -y git cpanminus libwww-perl libjson-perl > /dev/null 2>&1

        echo -e "${INFO} Cloning Nipe from GitHub..."
        git clone https://github.com/htrgouvea/nipe.git "$HOME/nipe"

        if [ -d "$HOME/nipe" ]; then
            cd "$HOME/nipe"
            echo -e "${INFO} Installing Nipe dependencies..."
            sudo cpanm --notest Switch JSON LWP::UserAgent Config::Simple

            echo -e "${INFO} Running Nipe installer..."
            sudo perl nipe.pl install

            if [ -f "$HOME/nipe/nipe.pl" ]; then
                echo -e "${OK} Nipe installation ${GREEN}SUCCESSFUL${NC}."
            else
                echo -e "${ERR} Nipe installation ${RED}FAILED${NC}."
                exit 1
            fi
            cd - > /dev/null
        else
            echo -e "${ERR} FAILED to clone Nipe."
            exit 1
        fi
    fi

    for pkg in  nmap geoip-bin sshpass figlet
        do
    if dpkg -l "$pkg" >/dev/null 2>&1
    then
     echo -e "${OK} Package ${WHITE}$pkg${NC} is installed."
     sleep 0.5
    else
     echo -e "${WARN} Package ${WHITE}$pkg${NC} is missing. Installing..."
      sudo apt update -y >/dev/null 2>&1
      sudo apt install -y "$pkg"
    if dpkg -s "$pkg" >/dev/null 2>&1
    then
         echo -e "${OK} ${WHITE}$pkg${NC} installation ${GREEN}SUCCESS${NC}"
        else
     echo -e "${ERR} ${WHITE}$pkg${NC} installation ${RED}FAILED${NC}"
        fi
    fi
```

3. Function: ANON

Purpose: Guarantees network anonymity**:**

1. Retrieves the public IP and parses the country code using command chaining with curl, geoiplookup, and awk.
2. **Conditional Check:** If the country code is "IL", it locates the Nipe directory and executes a restart command to rotate the IP.
3. **Recursion:** The function calls itself again to re-verify the new IP until a non-Israeli address is confirmed.

```
#1.3/1.4 Anonymity Check
function ANON() {
      echo -e "\n${BOLD}--- Network Anonymity Check ---${NC}"
      IP=$(curl -s ifconfig.co)
      if [ -z "$IP" ]; then
         echo -e "${ERR} Could not fetch IP. Retrying..."
         sleep 5
         ANON
         return
      fi

      CN=$(geoiplookup $IP| awk '{print $4}' |tr -d ",")

      if [ "$CN" == "IL" ]
      then
            echo -e "${RED}[!!!] ALERT:${NC} IP is from ${RED}IL${NC}. Connecting to Nipe..."
            NIPE_PATH=$(find / -type d -name "nipe" 2>/dev/null | head -n 1)
            cd $NIPE_PATH
             perl nipe.pl restart
             perl nipe.pl restart
             perl nipe.pl restart
             ANON
      else
             echo -e "${OK} Status: ${GREEN}Anonymous${NC} | Country: ${WHITE}$CN${NC}"
      fi
}
```

4. Function: RMSCAN

Purpose: The main function of the tool, remote scanning. and data logging:

- **Connection:** Uses sshpass to automate password entry, allowing non-interactive SSH connections.
- **StrictHostKeyChecking:** Disabled to prevent the script from hanging on SSH verification prompts.
- **Data Redirection:** Executes remote commands (whois, nmap) and appends the output to local files using the >> (wohis/nmap.txt).

```
function RMSCAN()
 {
    echo -e "\n${BOLD}--- Remote Target Configuration ---${NC}"

    # We use echo -n for input to keep the cursor on the same line nicely
    echo -e -n "${INFO} Enter remote ssh username: "
    read SSH_USER

    echo -e -n "${INFO} Enter remote server password: "
    read -s SSH_PASS # -s hides the password typing for security
    echo ""

    echo -e -n "${INFO} Enter remote server IP: "
    read SSH_IP

    echo -e "${INFO} Target locked: ${CYAN}$SSH_IP${NC}"

    #2.1 Display Details
    REMOTE_IP=$(sshpass -p "$SSH_PASS"  ssh -o StrictHostKeyChecking=no $SSH_USER@$SSH_IP "curl -s ifconfig.co")
    REMOTE_COUNTRY=$(sshpass -p "$SSH_PASS" ssh -o StrictHostKeyChecking=no $SSH_USER@$SSH_IP "geoiplookup $REMOTE_IP" | awk '{print $5}')
    REMOTE_UPTIME=$(sshpass -p "$SSH_PASS" ssh -o StrictHostKeyChecking=no $SSH_USER@$SSH_IP "uptime")

    echo -e "\n${BOLD}--- Remote Server Recon ---${NC}"
    echo -e "IP Address : ${CYAN}$REMOTE_IP${NC}"
    sleep 1
    echo -e "Location   : ${CYAN}$REMOTE_COUNTRY${NC}"
    sleep 1
    echo -e "Uptime     : ${WHITE}$REMOTE_UPTIME${NC}"
    sleep 1

    log_message "Scan started."
    log_message "Remote used: $REMOTE_IP ($REMOTE_COUNTRY)"

    #2.2 Whois
    echo -e "\n${INFO} Starting ${BOLD}Whois${NC} scan on ${CYAN}$SSH_IP${NC}..."
    sshpass -p "$SSH_PASS" ssh -o StrictHostKeyChecking=no $SSH_USER@$SSH_IP "whois $SSH_IP" >>whois_data.txt
    echo -e "${OK} Whois data saved to: ${WHITE}whois_data.txt${NC}"
    log_message "Whois saved."

    #2.3 Nmap
    echo -e "${INFO} Starting ${BOLD}Nmap${NC} scan on ${CYAN}$SSH_IP${NC} (Please wait...)"
    sshpass -p "$SSH_PASS" ssh $SSH_USER@$SSH_IP "nmap -A $SSH_IP" >> nmap_data.txt
    echo -e "${OK} Nmap results saved to: ${WHITE}nmap_data.txt${NC}"
    log_message "Nmap saved."

    echo -e "\n${GREEN}✔ Scan Process Complete.${NC} Log updated."
    log_message "Scan finished."
```

5. Function: log_message

Purpose: Maintains a standardized event log.**:** Accepts a text argument and appends it to scan_log.txt, prefixed with a precise timestamp generated by $(date ...). This ensures a clean, chronological record of all automated actions.

```
log_message() {
    echo "[$(date '+%Y-%m-%d %H:%M:%S')] - $1" >> "$LOG_FILE"
}
```

7. Technical Skills Gained

Through this project, I developed the following technical skills:

- **Automated Environment Setup:** Scripting the detection and installation of software packages.
- **Network Intelligence:** Programmatically retrieving and parsing public IP and geolocation data.
- **SSH Automation:** Utilizing sshpass for handling remote authentication and command execution.
- **Data Management:** Implementing structured logging with timestamps and managing file I/O streams.
- **User Interaction:** Capturing and processing user input effectively.

8. Summary

This project resulted in a fully automated, user-friendly tool that handles dependencies, enforces anonymity, connects to remote targets, and performs detailed reconnaissance. It successfully documents all activities in an organized log while protecting the operator's identity