

PROFESSIONAL TRAINING REPORT
at
SATHYABAMA INSTITUTE OF SCIENCE AND
TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Technology in Information Technology

By

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DEPARTMENT OF INFORMATION TECHNOLOGY
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(DEEMED TO BE UNIVERSITY)
(Established under Section 3 of UGC Act, 1956)
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**SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
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UNIVERSITY)**

Accredited with Grade "A" by NAAC
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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work Of
PRIYADHARSHANI. B (Reg. No: 39120086) who carried out the project entitled
“**ARP Scanner Using Bash Script**” under my supervision from September 2021 to
November 2021.

Internal Guide

Dr.A. SIVASANGARI, M.E.,PH.D.,

Head of the Department

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Submitted for Viva voce Examination held on _____

Internal Examiner

External Examiner

DECLARATION

I, PRIYADHARSHANI.B (Reg. No. 39120086) hereby declare that the project report entitled “**ARP Scanner Using Bash Script**” done by me under the guidance of **Dr. A.SIVASANGARI, M.F.,PH,D.**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Degree in Information Technology.

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA UNIVERSITY OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T. Sasikala M.E., Ph.D**, Dean, School of Computing, **Dr. R. Subhashini, M.E., Ph.D. Head of the Department of Information Technology** for providing me necessary support and details at the right time during the progressive reviews.

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I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

TRAINING CERTIFICATE



CERTIFICATE OF COMPLETION

CSW-I-06-081121 is given to

PRIYADHARSHANI B

For completing the Cyber Security training that includes basics of Cyber Security, Pentesting, Networking, and WebApp.

Aaron V Sandeen

AARON SANDEEN
CEO - CSW

N. Vengatesh

VENGATESH NAGARAJAN
MENTOR

ABSTRACT

- **ARP Scanner** is a tool use to identify the **active live host** using ARP Protocol.
- ARP Scanner converts IP address to MAC address to scan the live host in the network environment eg: **LAN**. After identity the live host, it converts **MAC address to IP address** to display it.
- ARP Scanner is a CLI based tool and its only works in **Linux Operating System** eg; **Kali Linux**.
- In ARP Scanner I used **Bash Script** is a **CLI** based scripting language and it is faster because whole programming language contains commands.

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LIST OF ABBREVIATIONS

ABBREVIATIONS	EXPANSION
ARP	Address Resolution Protocol
BASH	Bourne Again Shell
OSI	Open System Interconnection
IP	Internet Protocol
LLC	Logical Link Control
MAC	Media Access Control
CLI	Command Line Interface
GUI	Graphical user Interface

INTRODUCTION

What is Cyber Security?

Cybersecurity is the protection of computer systems and networks from information disclosure, theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide. It is otherwise known as Computer Security or information Technology security.

IMPORTANCE OF CYBER SECURITY:

- User's asset is protected against various cyber security risk and remain intact.
- The importance of ensuring protection from attacks, damage and authorized access on networks, computers and programs is equivalent to daily routine operation of an organization.
- Helping to understand the current trend in it and develop effective solutions.
- Reducing vulnerability in information and ICT systems and networks.

COMMON TOOLS USED FOR CYBER SECURITY:

- ✓ Passwords
- ✓ Antivirus / Anti-malware software
- ✓ Software patches
- ✓ Fire walls
- ✓ Two factor authentication
- ✓ Encryption

REQUIREMENTS FOR PROJECT:

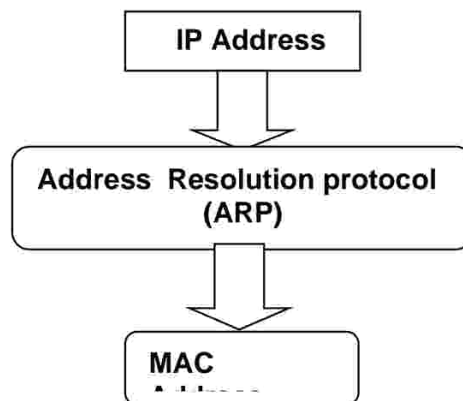
- Virtual box (Virtualization)
- Kali Linux (Main Operating system)
- Metasploitable (Vulnerable Machine)
- Visual code studio(Text editor)

ARP SCAN USING BASH PROJECT

OVERVIEW OF ARP AND BASH:

WHAT IS ARP ?

ARP was defined in 1982 by **RFC 826**. **ARP** stands for “**Address Resolution Protocol**” is a communication protocol used to find the **Media Access Control (MAC)**. This conversion protocol lies between the layer 2 (Data Link Layer) and layer 3 (Network Layer) of the **Open System Interconnection (OSI)** model. ARP is a **Request-Response** in which one device sends a request to another device asking for some information to which the other device will reply with the required information.



ARP packets are encapsulated by link layer and are distributed only in a particular network.

ADVANTAGE OF ARP:

- If you are using ARP, then MAC addresses can easily be known if you know the IP address of the same system.
- End nodes should not be configured to “know” MAC addresses. It can be found when needed.
- ARP’s goal is to enable each host on a network that allows you to build up a mapping between IP addresses and physical addresses.
- The set of mappings or table stored in the host is called **ARP table** or **ARP cache**.

IMPORTANT ARP TERMS:

An **ARP request** is a **broadcast**, and an **ARP response** is a **Unicast**.

ARP Request:

Broadcasting a packet over the network to validate whether we came across the destination MAC address or not.

- The physical address of the sender.
- The IP address of the sender.

- The physical address of the receiver.

2

- The IP address of the receiver

ARP Response/Reply:

The MAC address response that the source receives from the destination aids in further communication of the data.

DATA LINK LAYER:

The Data Link Layer is the protocol layer in a program that handles the moving of data into and out of a physical link in a network. The data link layer is **Layer 2** in the **OSI model** for a set of telecommunication protocols. Data bits are encoded, decoded and organized in the data link layer, before they are transported as frames between two adjacent nodes on the same **LAN** or **WAN**. The data link layer has **Two Sublayers**,

- **Logical Link Control (LLC)** sublayer.
- **Media Access Control (MAC)** sublayer.

LOGICAL LINK CONTROL:

It deals with **protocols, flow-control, and error control**.

MEDIA ACCESS CONTROL (MAC):

Media Access Control (MAC) Address is a physical address which works at Data Link Layer. MAC Address is also known as **Physical Address** of a network device. It deals with actual control of media.

Types of MAC address:

- Unicast
- Multicast
- Broadcast

BASH:

- ❖ **BASH** stands for **Bourne Again Shell** is command line language for **UNIX** based Operating System. It allows you to control your computer like a developer.
- ❖ Bash Is a **UNIX Command Line Interface (CLI)**. It's a command language that allows us to work with files on our computers in a way that's far more efficient and powerful than using a **Graphical User Interface (GUI)**
- ❖ To save the file with the extension of **.sh**
- ❖ To execute bash script **sudo ./filename.sh**

SUMMARY:

RESULT:

Thus I expected result of ARP Scanner executed and identified active live host successfully

Conclusion:

- ARP protocol helps to find the MAC (Media Access Control) address given the system's ip address.
- Important ARP terms are:
 - 1)ARP Cache 2)ARP Cache Timeout 3) ARP request 4) ARP response/reply
- The components of ARP header are:
 - 1)Hardware Type 2) Protocol Type 3) Hardware Address Length 4) Protocol Address Length 5) Senders Hardware Address 6) Senders Protocol Address 7) Target Hardware Address 8) Target Protocol Address.

REFERENCE:

- [1] Linux for hackers: OccupyTheWeb, 4 December 2018.
- [2] Red Team Field Manual: Ben Clark,11 February 2014.
- [3] Classic Shell Scripting: Hidden Commands that Unlock the Power of Unix.

APPENDIX**SOURCE CODE**

```
#!/bin/bash
#:k
#colors
b="\033[1;37m"
r="\033[1;31m"
v="\033[1;32m"
a="\033[1;33m"
cy="\033[0;96m"
nc="\e[0m"
```

```
#var
shell=">"
n1=1
n2=2
n3=3
n4=4
n5=5
z="IP?"
```

```
x="Scan IP:"
c="Scan Completed"
w="Scan ARP"
in="Invalid Option"
```

```
function banner(){
    echo ""
```

```
    echo -e
"$cy=====
="
    echo -e "$cy===== ="
    echo -e "$cy===== ="
    echo -e "$a===== ="
    echo -e "$a===== ="
    echo -e "$a===== ="
    echo -e "$r===== ="
    echo -e "$r===== ="
    echo -e "$r===== ="
    echo -e "$v===== ="
    echo -e
"$v=====
"
    echo ""
    echo -e "$cy
    echo -e "$cy
    echo -e "$cy
755697200/"
    echo ""
}
```

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```
function main(){
    echo -e "$b[$v$n1$b] Scan ARP Network $cy(Active Host)$nc"
    echo -e "$b[$v$n2$b] Exit"
    echo ""
}
```

```
function menu(){
```

```
read -p " $(echo -e $v$shell $nc)" opc
```

```

if [ $opc -eq 1 ]; then
    echo ""
    echo -e "$a$w$v $ip $nc"
    echo -e "$cy"
    arp-scan -l | grep -v "Interface:" | grep -v "Starting" | grep -v "packets" | grep -v "Ending" | awk
'{print $1}'
    echo -e "$nc"
    echo -e "$a$c$nc"
    echo ""

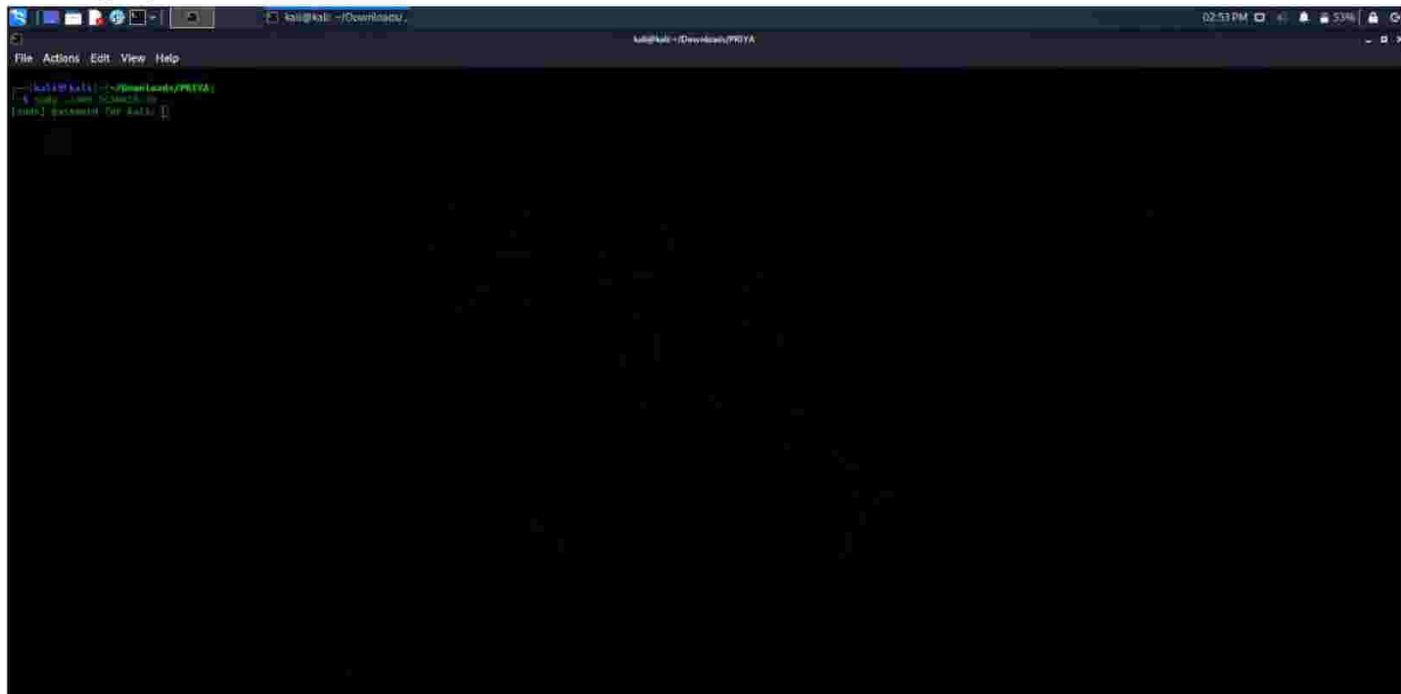
elif [ $opc -eq 2 ]; then
    echo ""
    echo ""
    echo -e "$b#### $v BYE $v RESEARCHER $b ####"
    echo ""
    echo ""
    sleep 3
    exit
else
    echo ""
    echo -e "$a$in$nc"
    echo ""
    sleep 2
    banner
    main
    menu
fi
}

clear
banner
main
menu

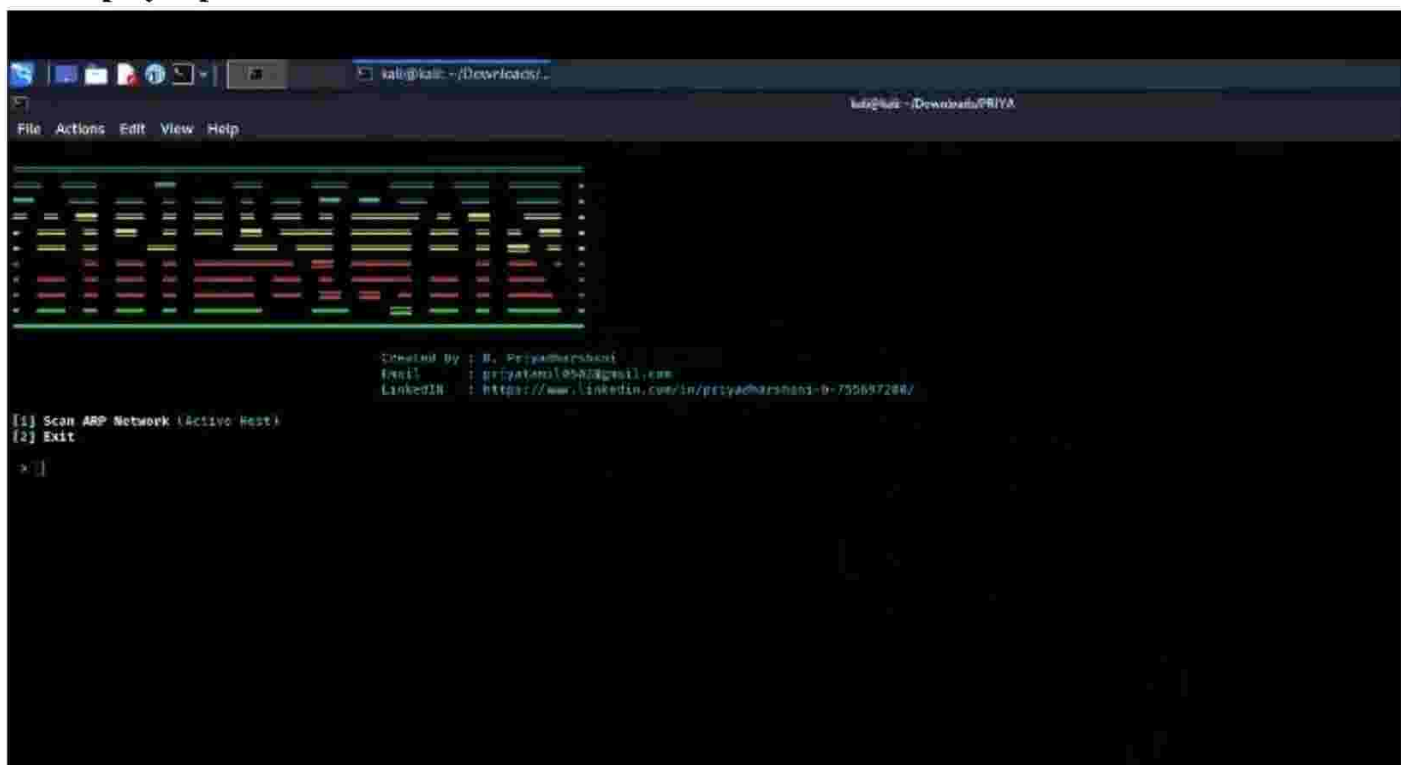
```

SCREENSHOTS:

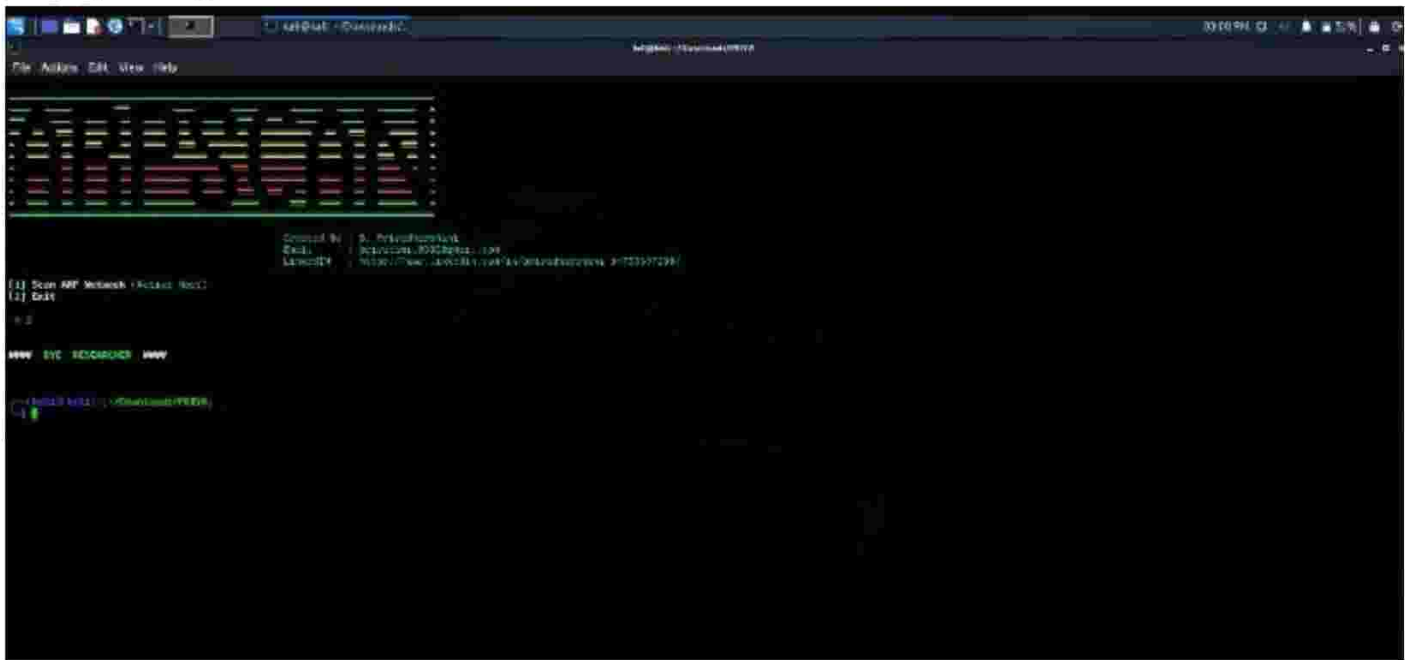
1.1 Display the code:



1.2 Displays option 1 and 2



1.2 Displays the type 1



1.3 displays the Live Active Host IP address

