ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

(A Unit of Alva's Education Foundation)

MOODBIDRI , DAKSHINA KANNADA-574225

ALVA'S
Education Foundation®

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(IoT & Cyber Security including Blockchain)

IV SEMESTER

NOTES

ON

CYBER SECURITY LAB

Subject Code:BICL404

UNDER THE GUIDANCE OF

Ms. K Swathi / Mr. Anveeksh Rao

2023-2024

Cyber Security lab		Semester	IV
Course Code	**BICL 404**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2:0	SEE Marks	50
Credits	01	Exam Hours	100
Examination type (SEE)	Practical		

Course objectives:

- To get Practical exposure of Cyber security threats
- To get Practical exposure on Forensics Tools

Sl.NO	Experiments
1	Install Kali Linux and explore basic Linux commands and tools.
2	Perform basic network scanning using the Nmap tool (Zenmap on Windows). Identify services, open ports, active hosts, operating systems, and vulnerabilities.
3	Phishing simulations (Google, LUCY and GoPhish).
4	Packet analysis using Wireshark.
5	Ransomware tabletop exercise on insider threat.
6	Perform SQL injection using BurpSuite
7	Installation of Wire shark, tcpdump, etc and observe data transferred in client server communication using UDP/TCP and identify the UDP/TCP datagram
8	Installation of rootkits and study about the variety of options
9	Perform an Experiment to Sniff Traffic using ARP Poisoning
10	Demonstrate intrusion detection system using snort

Course outcomes (Course Skill Set):

At the end of the course the student will be able to:

- Demonstrate the usage of tools to identify cyber threats/attacks
- Use Autopsy tools for digital forensic.
- Demonstrate Network analysis using Network miner tools.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation (CIE):

CIE marks for the practical course are **50 Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

- Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to **30 marks** (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

- SEE marks for the practical course are 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute.
- The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted between the schedule mentioned in the academic calendar of the University.
- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the

examiners jointly.

- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.

General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.

The minimum duration of SEE is 02 hours

Suggested Learning Resources:

- Real digital Forensics for Handheld Devices, E.P Dorothy, Auerback Publications, 2013
- The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics, J. Sammons, Syngress Publishing, 2012
- Handbook of Digital Forensics and Investigation, E. Casey , Academic Press, 2010
- Malware Forensics Field Guide for Windows Systems: Digital Forensics Field Guides, C.H Malin, E. Casey and J M Aquilina, Syngress, 2012
- The Best Damn Cybercrime and digital forensics Book Period, J Wiles and A Reyes, Syngress, 2007

Experiment 1

Install Kali Linux and explore basic Linux commands and tools:

Objective:

The objective of this lab is to introduce students to Kali Linux, a powerful Linux distribution widely used for penetration testing, digital forensics, and security auditing. By the end of this lab, students should be familiar with the installation process of Kali Linux and have a basic understanding of Linux commands and tools.

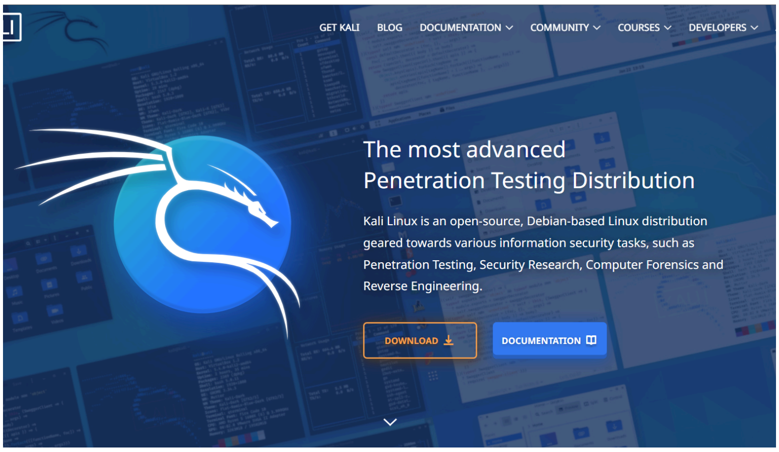
Materials Required:

1. A computer with at least 4GB of RAM and 20GB of free disk space
2. Kali Linux ISO file (available for download from the official Kali Linux website)
3. Virtualization software such as VirtualBox or VMware

Procedure:

Step 1: Download Kali Linux ISO:

- Visit the official Kali Linux website (https://www.kali.org/) and navigate to the "Downloads" section.
- Download the appropriate ISO image for your system (e.g., 64-bit ISO for most modern systems).

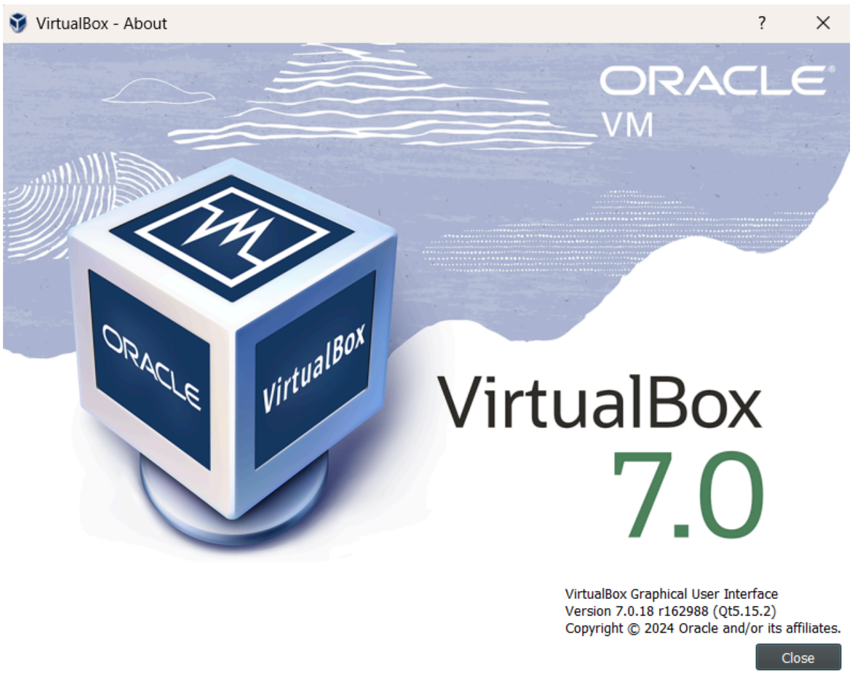


The most advanced
Penetration Testing Distribution

Kali Linux is an open-source, Debian-based Linux distribution geared towards various information security tasks, such as Penetration Testing, Security Research, Computer Forensics and Reverse Engineering.

Step 2: Install Virtualization Software:

- If not already installed, download and install virtualization software such as VirtualBox or VMware on your host machine.
- Follow the installation instructions provided by the virtualization software.



VirtualBox Graphical User Interface
Version 7.0.18 r162988 (Qt5.15.2)
Copyright © 2024 Oracle and/or its affiliates.

Step 3: Create a New Virtual Machine:

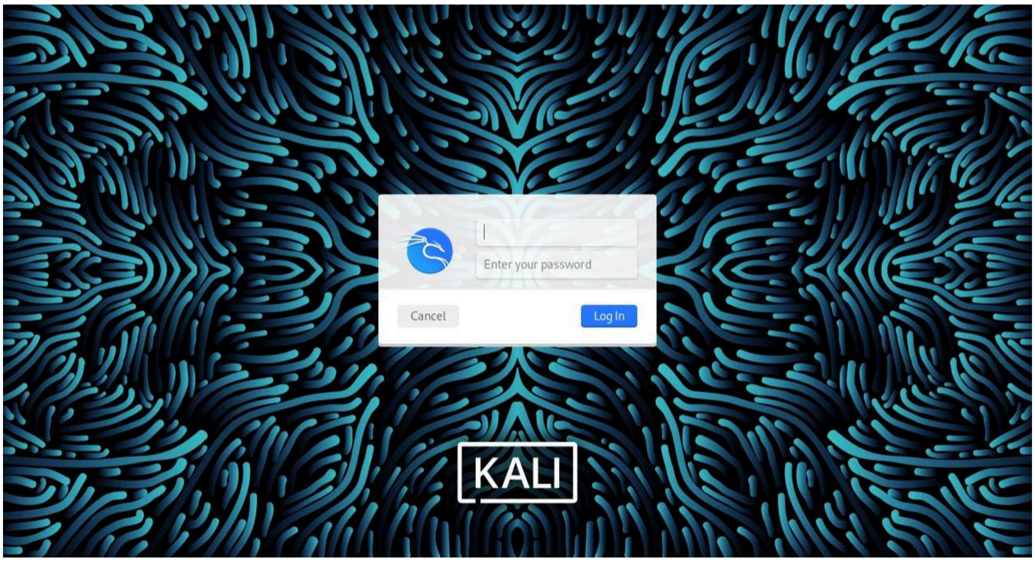
- Open VirtualBox or VMware and create a new virtual machine.
- Choose "Linux" as the operating system type and "Debian (64-bit)" as the version.
- Allocate at least 2GB of RAM and 20GB of disk space for the virtual machine.

Step 4: Install Kali Linux:

- Start the virtual machine and select the Kali Linux ISO file as the bootable media.
- Follow the on-screen instructions to install Kali Linux.
- Choose the appropriate options such as language, timezone, keyboard layout, and disk partitioning.
- Set up a username, password, and hostname for the Kali Linux installation.
- Wait for the installation process to complete.

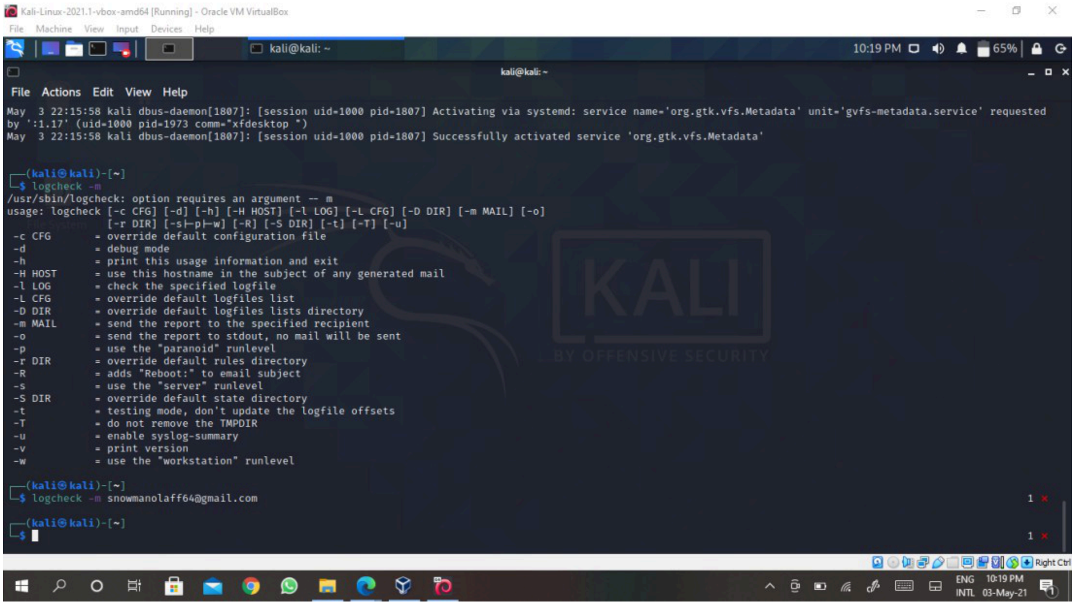
Step 5: Log in to Kali Linux:

- Once the installation is complete, restart the virtual machine.
- Log in using the username and password created during the installation process.



Step 6: Explore Basic Linux Commands and Tools:

- Once logged in, open the terminal emulator.
- Familiarize yourself with basic Linux commands such as **ls**, **cd**, **mkdir**, **rm**, **cp**, **mv**, etc.
- Explore system information commands like **uname**, **hostname**, **ifconfig**, **df**, **free**, etc.
- Experiment with package management commands such as **apt** or **apt-get** to install, update, and remove software packages.
- Discover some basic Kali Linux tools such as **nmap**, **metasploit**, **wireshark**, **hydra**, **john**, etc. (Note: Due to the nature of these tools, exercise caution and use them responsibly in a controlled environment.)


Kali-Linux-2021.1-vbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
kali@kali: ~
10:19 PM
65%
kali@kali: ~
File Actions Edit View Help
Right Ctrl
ENG INTL
10:19 PM
03-May-21

```
May  3 22:15:58 kali dbus-daemon[1807]: [session uid=1000 pid=1807] Activating via systemd: service name='org.gtk.vfs.Metadata' unit='gvfs-metadata.service' requested
by ':1.17' (uid=1000 pid=1973 comm="xfdesktop ")
May  3 22:15:58 kali dbus-daemon[1807]: [session uid=1000 pid=1807] Successfully activated service 'org.gtk.vfs.Metadata'


┌──(kali㉿kali)-[~]
└─$ logcheck -m
/usr/sbin/logcheck: option requires an argument -- m
usage: logcheck [-c CFG] [-d] [-h] [-H HOST] [-l LOG] [-L CFG] [-D DIR] [-m MAIL] [-o]
                [-r DIR] [-s|-p|-w] [-R] [-S DIR] [-t] [-T] [-u]
 -c CFG       = override default configuration file
 -d           = debug mode
 -h           = print this usage information and exit
 -H HOST      = use this hostname in the subject of any generated mail
 -l LOG       = check the specified logfile
 -L CFG       = override default logfiles list
 -D DIR       = override default logfiles lists directory
 -m MAIL      = send the report to the specified recipient
 -o           = send the report to stdout, no mail will be sent
 -p           = use the "paranoid" runlevel
 -r DIR       = override default rules directory
 -R           = adds "Reboot:" to email subject
 -s           = use the "server" runlevel
 -S DIR       = override default state directory
 -t           = testing mode, don't update the logfile offsets
 -T           = do not remove the TMPDIR
 -u           = enable syslog-summary
 -v           = print version
 -w           = use the "workstation" runlevel

┌──(kali㉿kali)-[~]
└─$ logcheck -m snowmanolaff64@gmail.com                                        1 ✗

┌──(kali㉿kali)-[~]
└─$ █                                                                           1 ✗
```

Step 7: Conclusion:

- Congratulations! You have successfully installed Kali Linux and explored basic Linux commands and tools.
- Experiment further with the Linux environment and tools to deepen your understanding and proficiency.

Safety Precautions:

- Use Kali Linux and its tools responsibly and legally.
- Exercise caution when running commands or using tools that could potentially harm systems or networks.
- Ensure that you are using Kali Linux in a controlled environment, such as a virtual machine, for educational purposes only.

Note: This lab manual is intended for educational purposes only. It is important to respect the laws and regulations governing the use of penetration testing tools and techniques.