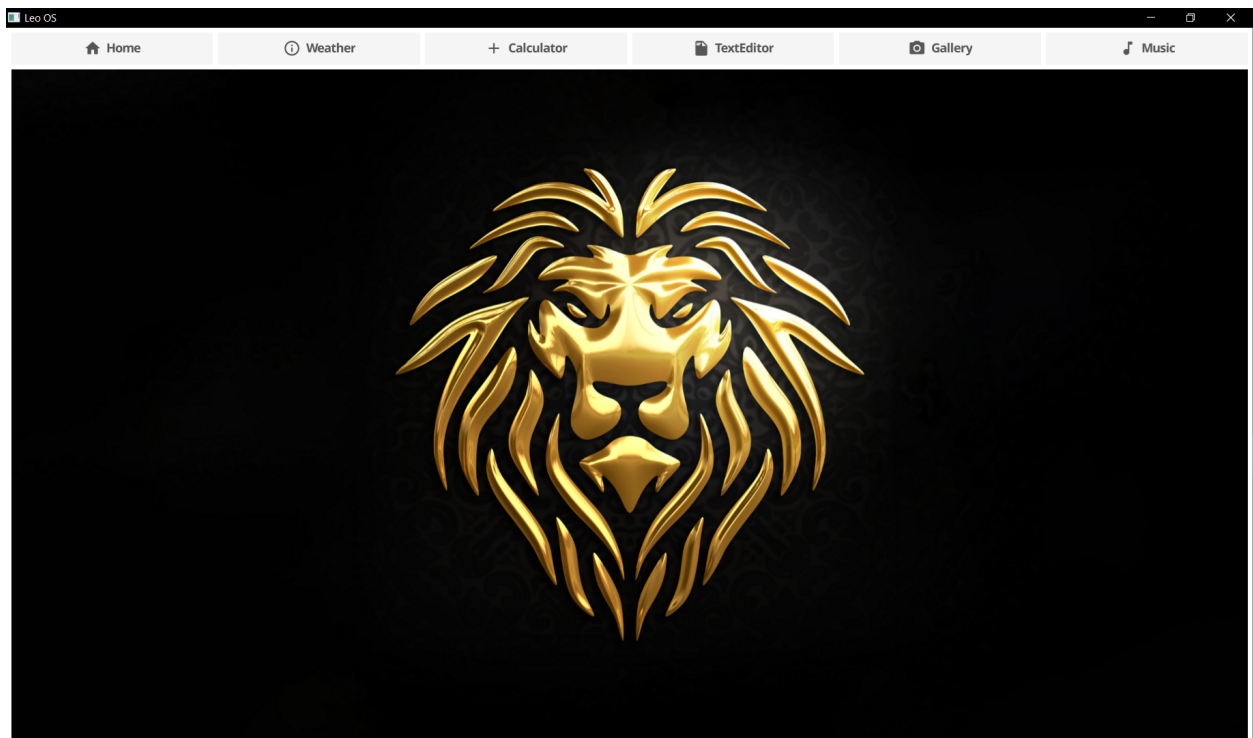


PSG COLLEGE OF TECHNOLOGY  
OPERATING SYSTEMS LAB (SEM IV)

**PACKAGE ABSTRACT**

**TITLE: VIRTUAL HACKING OPERATING SYSTEM — LEO OS**



**SUBMITTED BY:**

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## **VIRTUAL OS:**

An operating system that runs within a virtual environment or a virtual machine which is a software implementation of a physical machine that emulates the hardware of a computer system.

## **HACKING OS:**

A hacking operating system, also known as a penetration testing operating system or pentesting OS, is designed for use in cybersecurity testing and ethical hacking activities. These operating systems typically come preloaded with a variety of tools and software applications that are specifically geared towards identifying and exploiting vulnerabilities in computer systems, networks, and applications.

These are often used by cybersecurity professionals and ethical hackers to test the security of their own organization's systems or to perform security assessments for clients.

## **OBJECTIVE:**

This project involved the development of a virtual operating system with applications for common tasks such as a calculator, weather app, gallery, mp3 player, and text editor, using Go (Fyne) in Visual Studio Code. The

virtual operating system was then modified to include a suite of tools for hacking and cybersecurity purposes,

Including ,

1. Aircrack-ng
2. SQLMap
3. Nmap
4. Metasploit\*\*\*
5. Wireshark
6. Burp Suite
7. Bettercap
8. The Harvester.

The objective of the project was to create a flexible and user-friendly virtual operating system that can be used for ethical hacking and cybersecurity purposes. The virtual operating system provides a variety of tools that can be used for penetration testing, network monitoring, and data analysis.

### **TOOLS USED:**

1. VISUAL STUDIO CODE
2. VIRTUAL BOX
3. DEBIAN OS

## **METHODS:**

The project involved modifying Debian OS as a base to create a customized operating system that is tailored for hacking and cyber security purposes. Basic applications were developed using Go (Fyne) programming language, while popular hacking tools were integrated into the operating system to provide a comprehensive platform for cyber security professionals.

**Aircrack - ng** : used to monitor and capture wireless network traffic, crack WEP and WPA/WPA2-PSK keys, and perform various attacks against wireless networks.

**Sqlmap**: used to identify the database type, enumerate databases and tables, and extract sensitive data such as usernames and passwords.

**Nmap**: a network exploration and security auditing tool that is used to discover hosts and services on a computer network, as well as identify security vulnerabilities

**Wireshark** is a network protocol analyzer that allows users to capture and analyze network traffic in real-time.

**Bettercap** is a powerful network sniffer and man-in-the-middle (MITM) framework that can be used for network security testing and network analysis. It can be used to perform various network attacks, including ARP spoofing, DNS spoofing, and packet injection. Bettercap supports multiple platforms, including Linux, Windows, and macOS.

**Burp Suite** is a web application security testing tool that is used for finding and exploiting vulnerabilities in web applications

**The Harvester** is a reconnaissance tool that can be used to gather email addresses, subdomains, and other information from various sources, including search engines, social media, and public databases.

```
prakash@Leo: ~$ id
uid=1000(prakash) gid=1000(prakash) groups=1000(prakash),24(cdrom),25(floppy),29(audio),30(dip),44(video),46(plugdev),108(netdev),113(bluetooth),118(lpadmin),121(scanner)
prakash@Leo:~$ sudo su

We trust you have received the usual lecture from the local System Administrator. It usually boils down to these three things:

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.
```

```
prakash@Leo: ~$ sudo su
Setting up libwireshark14:amd64 (3.4.10-0+deb11u1) ...
Setting up wireshark-common (3.4.10-0+deb11u1) ...
Setting up libqt5gui5:amd64 (5.15.2+dfsg-9) ...
Setting up libqt5widgets5:amd64 (5.15.2+dfsg-9) ...
Setting up qt5-gtk-platformtheme:amd64 (5.15.2+dfsg-9) ...
Setting up libqt5multimedia5:amd64 (5.15.2-3) ...
Setting up libqt5printsupport5:amd64 (5.15.2+dfsg-9) ...
Setting up libqt5multimediawidgets5:amd64 (5.15.2-3) ...
Setting up libqt5multimediagsttools5:amd64 (5.15.2-3) ...
Setting up libqt5multimedia5-plugins:amd64 (5.15.2-3) ...
Setting up libqt5svg5:amd64 (5.15.2-3) ...
Setting up wireshark-qt (3.4.10-0+deb11u1) ...
Setting up wireshark (3.4.10-0+deb11u1) ...
Processing triggers for libc-bin (2.31-13+deb11u5) ...
Processing triggers for man-db (2.9.4-2) ...
Processing triggers for shared-mime-info (2.0-1) ...
Processing triggers for mailcap (3.69) ...
Processing triggers for desktop-file-utils (0.26-1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1) ...
root@Leo:/home/prakash#
```

```
prakash@Leo: ~  
prakash@Leo: ~ 83x21  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  ethtool hwloc ieee-data libbcg729-0 libc-ares2 libdouble-conversion3  
  libhwloc-plugins libhwloc15 liblinear4 libmd4c0 libminizip1 libpcre2-16-0  
  libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins  
  libqt5multimediagsttools5 libqt5multimediawidgets5 libqt5network5  
  libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2ldbl libwireshark-data  
  libwireshark14 libwiretap11 libwsutil12 libxcb-xinerama0 libxcb-xinput0  
  libxnvctrl0 nmap-common python3-magic qt5-gtk-platformtheme  
  qttranslations5-l10n rfc883 wireshark-common wireshark-qt  
Suggested packages:  
  gpsd libhwloc-contrib-plugins liblinear-tools liblinear-dev  
  qt5-image-formats-plugins qtwayland5 snmp-mibs-downloader geoipupdate  
  geoip-database geoip-database-extra libjs-leaflet libjs-leaflet.markercluster  
  wireshark-doc ncat ndiff zenmap  
The following NEW packages will be installed:  
  aircrack-ng ethtool hwloc ieee-data libbcg729-0 libc-ares2  
  libdouble-conversion3 libhwloc-plugins libhwloc15 liblinear4 libmd4c0  
  libminizip1 libpcre2-16-0 libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5
```

```
prakash@Leo: ~  
prakash@Leo: ~ 83x17  
root@Leo:/home/prakash# curl https://raw.githubusercontent.com/rapid7/metasploit-omnibus/master/config/templates/metasploit-framework-wrappers/msfupdate.erb > msfinstall && \  
  chmod 755 msfinstall && \  
  ./msfinstall
```

```
prakash@Leo: ~  
prakash@Leo: ~ 83x17  
root@Leo:/home/prakash# curl https://raw.githubusercontent.com/rapid7/metasploit-framework-wrappers/msfupdate  
all && \  
  chmod 755 msfinstall && \  
  ./msfinstall  
bash: curl: command not found  
root@Leo:/home/prakash# apt-get install curl  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  libcurl4  
The following NEW packages will be installed:  
  curl
```

```
prakash@Leo: ~/Downloads  
prakash@Leo: ~/Downloads 83x16  
root@Leo:/home/prakash# exit  
exit  
prakash@Leo:~$ pwd  
/home/prakash  
prakash@Leo:~$ ls  
Desktop    Downloads  Music      Public      Videos  
Documents  msfinstall Pictures    Templates  
prakash@Leo:~$ cd Downloads/  
prakash@Leo:~/Downloads$ ls  
burpsuite_community_linux_v2023_2_3.sh  
prakash@Leo:~/Downloads$ chmod +x burpsuite_community_linux_v2023_2_3.sh  
prakash@Leo:~/Downloads$ ls  
burpsuite_community_linux_v2023_2_3.sh  
prakash@Leo:~/Downloads$ ./burpsuite_community_linux_v2023_2_3.sh  
Unpacking JRE ...  
Starting Installer ...
```

```
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1  
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1 83x16  
Unpacking JRE ...  
Starting Installer ...  
prakash@Leo:~/Downloads$ pwd  
/home/prakash/Downloads  
prakash@Leo:~/Downloads$ ls  
bettercap_linux_amd64_v2.31.1      burpsuite_community_linux_v2023_2_3.sh  
bettercap_linux_amd64_v2.31.1.zip  
prakash@Leo:~/Downloads$ pwd  
/home/prakash/Downloads  
prakash@Leo:~/Downloads$ cd bettercap_linux_amd64_v2.31.1/  
prakash@Leo:~/Downloads/bettercap_linux_amd64_v2.31.1$ ls  
bettercap  bettercap_linux_amd64_v2.31.1.sha256  
prakash@Leo:~/Downloads/bettercap_linux_amd64_v2.31.1$ ./bettercap  
./bettercap: error while loading shared libraries: libnetfilter_queue.so.1: cannot  
open shared object file: No such file or directory
```



```
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.187x16
prakash@Leo:~/Downloads/bettercap_linux_amd64_v2.31.1$ su root
Password:
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1# apt-cache search libnetfilter-queue
libnetfilter-queue-dev - Development files for libnetfilter-queue1
libnetfilter-queue-doc - Documentation files for libnetfilter-queue1
libnetfilter-queue1 - Netfilter netlink-queue library
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1# apt-get install libnetfilter-queue1
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  libnetfilter-queue1
```

```
prakash@Leo: ~
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.187x8
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1# ./bettercap
bettercap v2.31.1 (built for linux amd64 with go1.16.4) [type 'help' for a list of commands]

10.0.2.0/24 > 10.0.2.15 » [12:30:21] [sys.log] [war] Could not find mac for
10.0.2.0/24 > 10.0.2.15 » exit
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1#
```

```
prakash@Leo: ~ 93x12
prakash@Leo:~$ su root
Password:
root@Leo:/home/prakash# cd downloads/
bash: cd: downloads/: No such file or directory
root@Leo:/home/prakash# cd Downloads/
root@Leo:/home/prakash/Downloads# ls
bettercap_linux_amd64_v2.31.1      burpsuite_community_linux_v2023_2_3.sh
bettercap_linux_amd64_v2.31.1.zip
root@Leo:/home/prakash/Downloads# cd bettercap_linux_amd64_v2.31.1
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1# bettercap
bash: bettercap: command not found
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1#
```

```
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.187x8
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1# cp bettercap /usr/bin
root@Leo:/home/prakash/Downloads/bettercap_linux_amd64_v2.31.1#
```

```
prakash@Leo: ~ 93x12
root@Leo:/home/prakash# bettercap
bettercap v2.31.1 (built for linux amd64 with go1.16.4) [type 'help' for a list of commands]

10.0.2.0/24 > 10.0.2.15 » [12:39:06] [sys.log] [war] Could not find mac for
10.0.2.0/24 > 10.0.2.15 »
```

```
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1 87x21
root@Leo:/# cd /opt
root@Leo:/opt# ls
root@Leo:/opt# git clone https://github.com/laramies/theHarvester
bash: git: command not found
root@Leo:/opt# apt-get install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  git-man liberror-perl patch
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-el git-email git-gui gitk gitweb
  git-cvs git-mediawiki git-svn ed diffutils-doc
The following NEW packages will be installed:
  git git-man liberror-perl patch
0 upgraded, 4 newly installed, 0 to remove and 7 not upgraded.
Need to get 7,505 kB of archives.
After this operation, 38.2 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

```
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1 87x21
root@Leo:/opt# git clone https://github.com/laramies/theHarvester
Cloning into 'theHarvester'...
remote: Enumerating objects: 12558, done.
remote: Counting objects: 100% (29/29), done.
remote: Compressing objects: 100% (29/29), done.
remote: Total 12558 (delta 13), reused 0 (delta 0), pack-reused 12529
Receiving objects: 100% (12558/12558), 7.07 MiB | 325.00 KiB/s, done.
Resolving deltas: 100% (7877/7877), done.
root@Leo:/opt#
root@Leo:/opt#
root@Leo:/opt# ls
theHarvester
root@Leo:/opt#
```

```
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1 87x21
root@Leo:/opt# git clone https://github.com/laramies/theHarvester
Cloning into 'theHarvester'...
remote: Enumerating objects: 12558, done.
remote: Counting objects: 100% (29/29), done.
remote: Compressing objects: 100% (29/29), done.
remote: Total 12558 (delta 13), reused 0 (delta 0), pack-reused 12529
Receiving objects: 100% (12558/12558), 7.07 MiB | 325.00 KiB/s, done.
Resolving deltas: 100% (7877/7877), done.
root@Leo:/opt#
root@Leo:/opt#
root@Leo:/opt# ls
theHarvester
root@Leo:/opt# cd theHarvester/
root@Leo:/opt/theHarvester# python3 -m pip install -r requirements/base.txt
/usr/bin/python3: No module named pip
root@Leo:/opt/theHarvester#
```

```
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1 87x21
theHarvester
root@Leo:/opt# cd theHarvester/
root@Leo:/opt/theHarvester# python3 -m pip install -r requirements/base.txt
/usr/bin/python3: No module named pip
root@Leo:/opt/theHarvester# apt-get install pip
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'python3-pip' instead of 'pip'
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential dpkg-dev
  fakeroot g++ g++-10 gcc gcc-10 libalgorithm-diff-perl libalgorithm-diff-xs-perl
  libalgorithm-merge-perl libasan6 libbinutils libc-dev-bin libc-devtools libc6-dev
  libcc1-0 libcrypt-dev libctf-nobfd0 libctf0 libexpat1-dev libfakeroot libgcc-10-dev
  libitm1 libjs-jquery libjs-sphinxdoc libjs-underscore liblsan0 libnsl-dev
  libpython3-dev libpython3.9-dev libstdc++-10-dev libtirpc-dev libtsan0 libubsan1
  linux-libc-dev make manpages-dev python-pip-whl python3-dev python3-distutils
  python3-lib2to3 python3-setuptools python3-wheel python3.9-dev zlib1g-dev
Suggested packages:
  binutils-doc debian-keyring g++-multilib g++-10-multilib gcc-10-doc gcc-multilib
  autoconf automake libtool flex bison gdb gcc-doc gcc-10-multilib gcc-10-locales
```

```

prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1 87x21
Found existing installation: certifi 2020.6.20
Not uninstalling certifi at /usr/lib/python3/dist-packages, outside environment /
r
Can't uninstall 'certifi'. No files were found to uninstall.
Attempting uninstall: requests
Found existing installation: requests 2.25.1
Not uninstalling requests at /usr/lib/python3/dist-packages, outside environment
sr
Can't uninstall 'requests'. No files were found to uninstall.
Successfully installed PyYAML-6.0 XlsxWriter-3.0.9 aiodns-3.0.0 aiofiles-23.1.0 aioht
-3.8.4 aiomultiprocess-0.9.0 aiosignal-1.3.1 aiosqlite-0.18.0 anyio-3.6.2 appdirs-1.4
async-timeout-4.0.2 attrs-22.2.0 backoff-2.2.1 beautifulsoup4-4.11.2 censys-2.1.9 ce
ifi-2022.12.7 cffi-1.15.1 charset-normalizer-3.1.0 click-8.1.3 click-plugins-1.1.1 co
rama-0.4.6 deprecated-1.2.13 dnspython-2.3.0 fastapi-0.94.1 frozenlist-1.3.3 h11-0.14
importlib-metadata-6.0.0 limits-2.8.0 lxml-4.9.2 markdown-it-py-2.2.0 mdurl-0.1.2 mu
idict-6.0.4 netaddr-0.8.0 packaging-22.0 pycares-4.3.0 pycparser-2.21 pydantic-1.10.6
pyee-8.2.2 pygments-2.14.0 pyppeteer-1.0.2 requests-2.28.2 retrying-1.3.4 rich-13.3.2
tuptools-67.6.0 shodan-1.28.0 slowapi-0.1.7 sniffio-1.3.0 soupsieve-2.4 starlette-0.2
1 tqdm-4.65.0 typing-extensions-4.5.0 ujson-5.7.0 uvicorn-0.21.1 uvloop-0.17.0 websoc
ts-10.4 wrapt-1.15.0 yarl-1.8.2 zipp-3.15.0
root@Leo:/opt/theHarvester# python3 theHarvester.py -h

```

```

prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1
prakash@Leo: ~/Downloads/bettercap_linux_amd64_v2.31.1 87x21
BaseException | Any]:
TypeError: unsupported operand type(s) for |: 'type' and '_SpecialForm'
root@Leo:/opt/theHarvester# theHarvester.py -h
bash: theHarvester.py: command not found
root@Leo:/opt/theHarvester# theHarvester.py
bash: theHarvester.py: command not found
root@Leo:/opt/theHarvester# pip install theHarvester
WARNING: Retrying (Retry(total=4, connect=None, read=None, redirect=None, status=None))
after connection broken by 'NewConnectionError('<urllib3.connection.HTTPSConnection ob
ject at 0x7fcf55c29610>: Failed to establish a new connection: [Errno -2] Name or servi
ce not known')': /simple/theharvester/
WARNING: Retrying (Retry(total=3, connect=None, read=None, redirect=None, status=None))
after connection broken by 'NewConnectionError('<urllib3.connection.HTTPSConnection ob
ject at 0x7fcf55c29340>: Failed to establish a new connection: [Errno -2] Name or servi
ce not known')': /simple/theharvester/
Collecting theHarvester
  Downloading theHarvester-0.0.1-py3-none-any.whl (97 kB)
    |████████████████████████████████████████| 97 kB 343 kB/s
Installing collected packages: theHarvester
Successfully installed theHarvester-0.0.1
root@Leo:/opt/theHarvester#

```