WGMY Fortnight Challenge #0402

By : H0j3n (UiTM)

Tools : IDA Pro x32 , X32dbg , ExeinfoPe

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#0402 Keygenme

We need the key badly but too bad, the server is no
longer up. Can you help us to get the key? Even happier
of you can give us a keygen.
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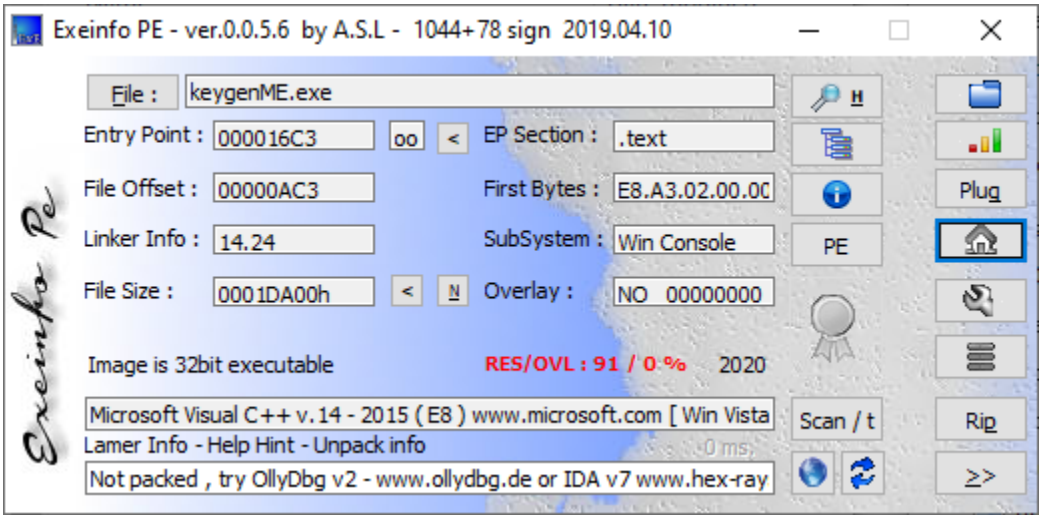
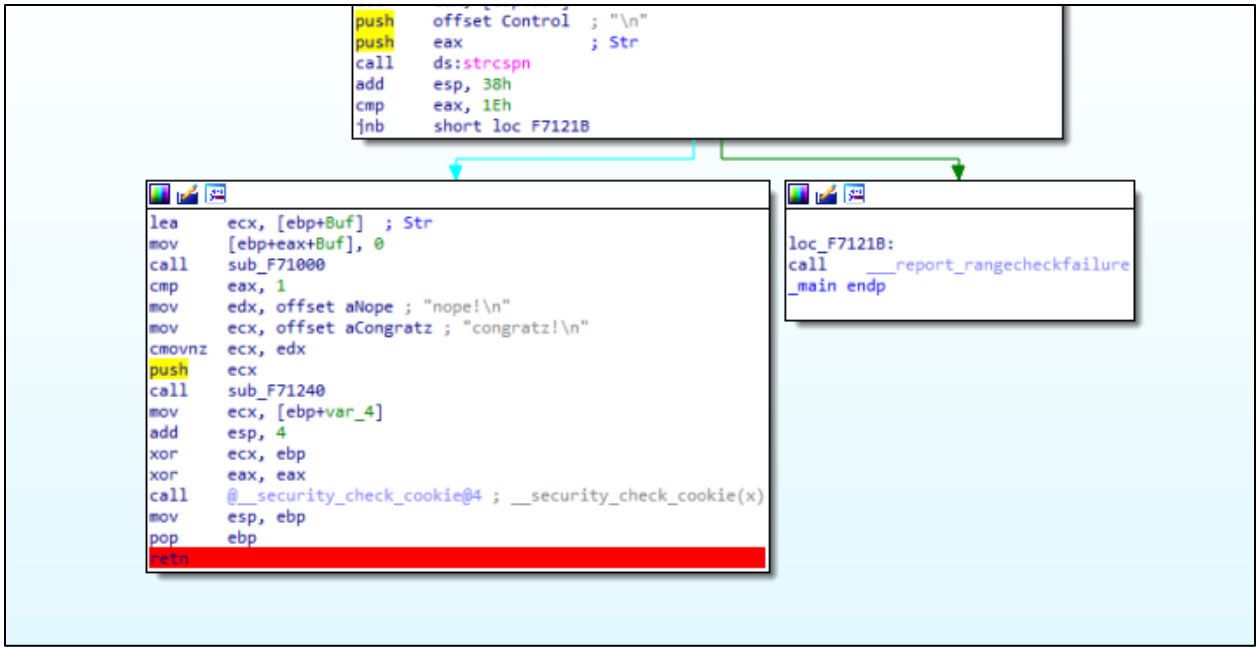
```

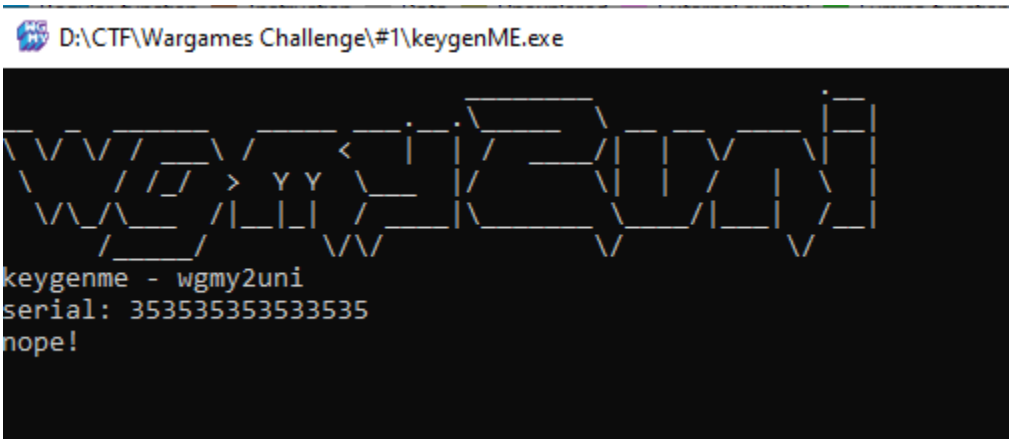
First lets analyze this file using ExeinfoPE .



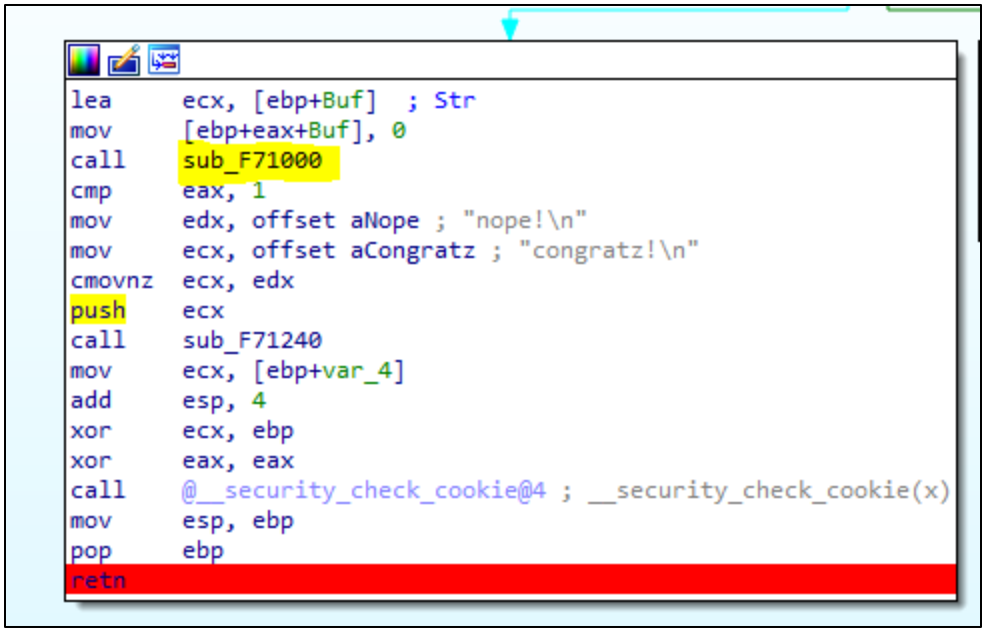
This file is 32bit executable so lets use Ida Pro to see how the program works!



I set breakpoint before the program end to see what the output .

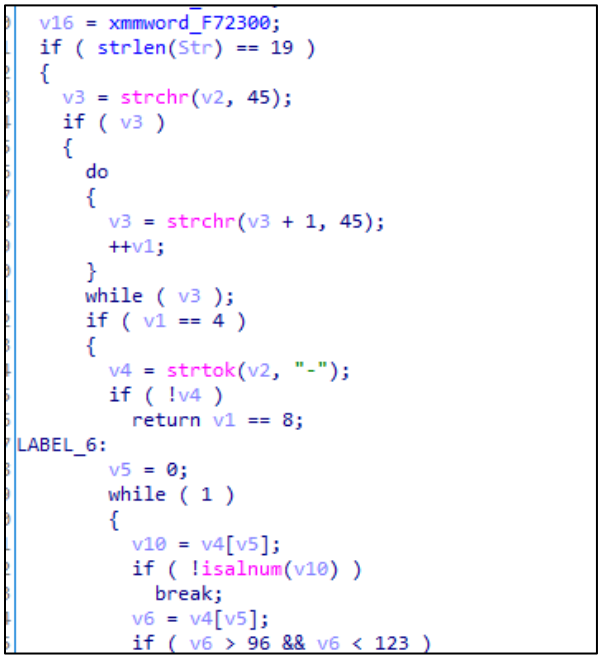


Yeah its not working mhmm lets take a look inside the function!



```
lea     ecx, [ebp+Buf]  ; Str
mov     [ebp+eax+Buf], 0
call    sub_F71000
cmp     eax, 1
mov     edx, offset aNope ; "nope!\n"
mov     ecx, offset aCongratz ; "congratz!\n"
cmovnz  ecx, edx
push    ecx
call    sub_F71240
mov     ecx, [ebp+var_4]
add     esp, 4
xor     ecx, ebp
xor     eax, eax
call    @__security_check_cookie@4 ; __security_check_cookie(x)
mov     esp, ebp
pop     ebp
retn
```

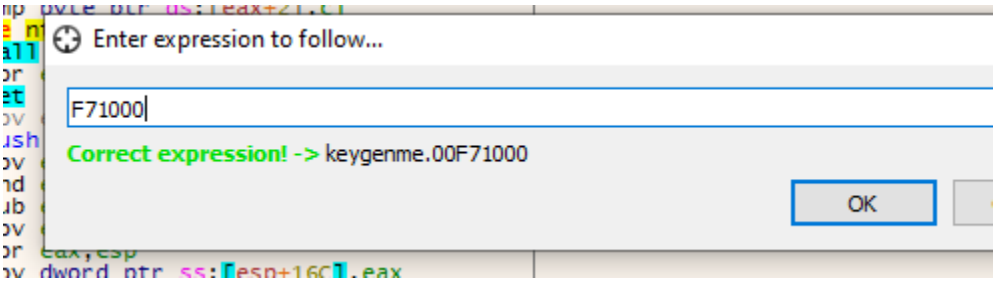
It call sub_F71000 and under that we found cmp eax with 1 and from that functions I feel curious what happens inside that function so lets we take a look!



```
v16 = xmmword_F72300;
if ( strlen(Str) == 19 )
{
  v3 = strchr(v2, 45);
  if ( v3 )
  {
    do
    {
      v3 = strchr(v3 + 1, 45);
      ++v1;
    }
    while ( v3 );
    if ( v1 == 4 )
    {
      v4 = strtok(v2, "-");
      if ( !v4 )
        return v1 == 8;
LABEL_6:
      v5 = 0;
      while ( 1 )
      {
        v10 = v4[v5];
        if ( !isalnum(v10) )
          break;
        v6 = v4[v5];
        if ( v6 > 96 && v6 < 123 )
```

I use decompiler and found out that the serial key must 19 length and if its true they will go through some if statement and we found something like isalnum(), strtok(),strchr() and when I have done a lot of googling with this function and we found out that the format should be like this XXXX-XXXX-XXXX-XXXX which satisfy the length and the format which consist of alphanumeric ! How do i know that format because I have try coding back some of the function like strchr() with ++v1; and it needs 3 "-" to go for next if statement. Strchr() will find the first occurrence of "-" and if there is any strings left it will continue

with the looping until not strings left .Now what we should do is to find this memory address to look further using x32dbg!

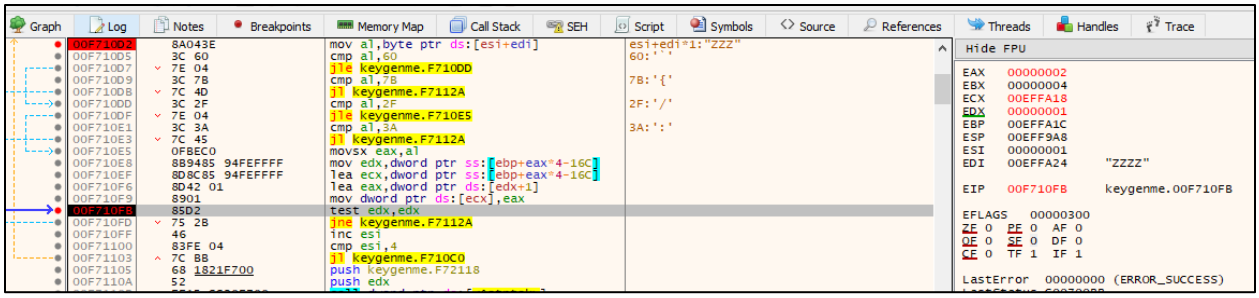


So we know that function just now is F71000 so in x32dbg use CTRL + G to find the address and we set the breakpoint in that address ! I have been struggling to understand how this things work so I try but randomly alphanumeric so find out how it works and when I input aaaa-aaaa-aaaa-aaaa its not passing all the four if statement inside that function .

```
v10 = v4[v5];
if ( !isalnum(v10) )
  break;
v6 = v4[v5];
if ( v6 > 96 && v6 < 123 )
  break;
if ( v6 > 47 && v6 < 58 )
  break;
v7 = Stra[v6];
Stra[v6] = v7 + 1;
if ( v7 )
  break;
if ( ++v5 >= 4 )
{
  v4 = strtok(0, "-");
  ++v1;
  if ( v4 )
    goto LABEL_6;
  return v1 == 8;
}
```

```
v5 = 0;
while ( 1 )
{
  v10 = v4[v5];
  if ( !isalnum(v10) )
    break;
  v6 = v4[v5];
  if ( v6 > '`' && v6 < '{' )
    break;
  if ( v6 > '/' && v6 < ':' )
    break;
  v7 = Stra[v6];
  Stra[v6] = v7 + 1;
  if ( v7 )
    break;
  if ( ++v5 >= 4 )
  {
    v4 = strtok(0, "-");
    ++v1;
    if ( v4 )
      goto LABEL_6;
    return v1 == 8;
  }
```

The left one with decimal and the right one with char conversion so our serial key must pass this value ! I try a lot of character till I found something which it accept Uppercase character like A-Z and that's when I look at their hex value and its bigger than all the hex so lets try one by one ! when I first put Z in all character inside the serial like this ZZZZ-ZZZZ-ZZZZ-ZZZZ it only accept the first Z and the second Z it will return nope!. I check all of this inside x32dbg



I found out that the character that the program accept it will make edx 0 while false character will make edx 1 so we just need to make a serial that make all edx become 0 till the end of the serial key and it takes time actually till I found the serial key that works which this ! ZBCD-FHIJ-LNOP-QTUV . Now when I found this first serial key that works I try to create another one on how this things work and actually it accepts only [B,C,D,F,H,I,J,K,L,N,O,P,Q,T,U,V,X,Z] inside the serial key and no duplicate character !

Here some of serial keys that works

- BCDF-HIJK-LNOP-QTUV
- BCDF-HIJK-LNOP-QTUX
- HIFD-LJKN-PQTU-VXZB
- ZBCD-FHIJ-LNOP-QTUV

How about we create many serial keys that works on how much we want right? I try to create it using Python! 😊

Thank you for this great challenge ! 😊