easy_re

2021-09-05 | Challenge， 2021， 第七届全国工控系统信息安全攻防竞赛， 二类

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WriteUp来源

来自 毕方安全实验室 战队及 bad_cat 战队

题目描述

> 根据附件得出flag

提示信息

无

题目考点

- 逆向
- 换表base64

解题思路

下载附件，拖入IDA

```
  sub_455D73(&unk_52E00A);
  v7 = 0;
  sub_455EA9("Usage: xxx.exe -e flag");
  sub_455EA9("Usage: xxx.exe -x flag");
  if ( a1 == 3 )
  {
    v7 = sub_455EA4(*(_DWORD *)(a2 + 8));
    if ( !sub_453249("-e", *(_DWORD *)(a2 + 4)) )
    {
      sub_453AA0("%s\n", v7);
LABEL_14:
      sub_454D56(v7);
      LODWORD(v2) = 0;
      goto LABEL_15;
    }
    if ( sub_453249("-x", *(_DWORD *)(a2 + 4)) )
    {
      sub_455EA9("error2!");
      goto LABEL_14;
    }
    v6 = 0;
    sub_454DBA(&v6, "ct.txt", "r");
    if ( v6 )
    {
      sub_45407C(&v5, 255, v6);
      if ( sub_453249(v7, &v5) )
        sub_455EA9("No! The flag is wrong!");
      else
        sub_453AA0("Yes! The real flag is %s\n", *(_DWORD *)(a2 + 8));
      goto LABEL_14;
    }
    sub_453CB7("File ct.txt opening failed");
    LODWORD(v2) = 1;
  }
  else
  {
    sub_455EA9("error1!");
    LODWORD(v2) = -1;
  }
LABEL_15:
  v3 = v2;
  sub_454AC7(&savedregs, &dword_45AA04);
```

发现主要在 `455EA4` 处理数据，算法是 `base64`

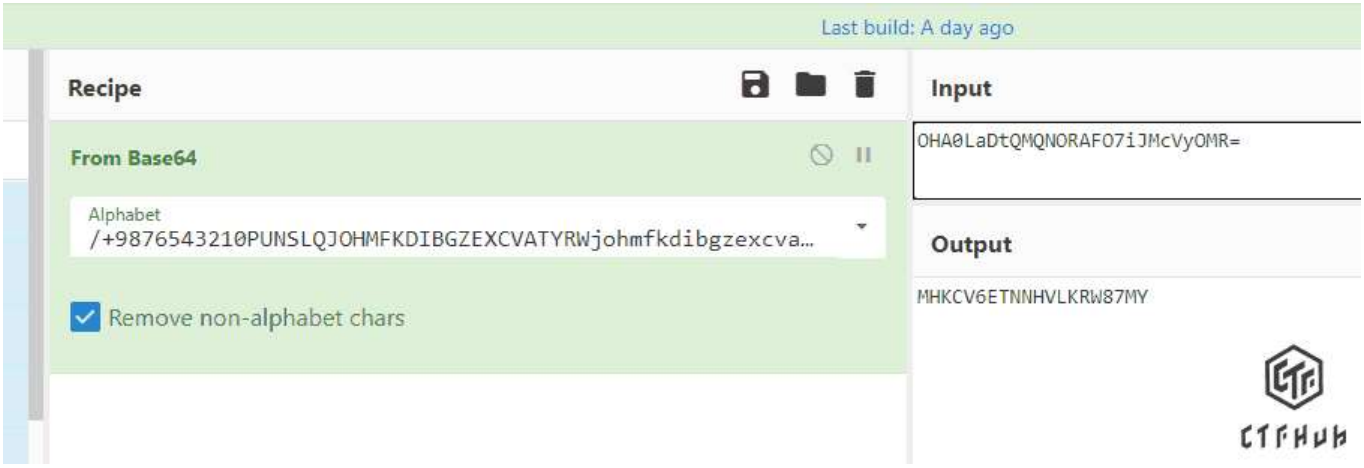
```
  int v3; // [esp+E0h] [ebp-2Ch]
  int v4; // [esp+ECh] [ebp-20h]
  int v5; // [esp+F8h] [ebp-14h]
  int v6; // [esp+104h] [ebp-8h]

  sub_455D73(&unk_52E003);
  sub_4538ED();
  sub_455A17();
  v5 = sub_456138(a1);
  if ( v5 % 3 )
    v6 = 4 * (v5 / 3) + 4;
  else
    v6 = 4 * (v5 / 3);
  v4 = sub_453357((v6 + 1) | -__CFADD__(v6, 1));
  *(_BYTE *)(v6 + v4) = 0;
  v3 = 0;
  v2 = 0;
  while ( v3 < v6 - 2 )
  {
    *(_BYTE *)(v3 + v4) = *(_BYTE *)(dword_52AF44 + ((signed int)*(unsigned __int8 *)(v2 + a1) >> 2));
    *(_BYTE *)(v3 + v4 + 1) = *(_BYTE *)(dword_52AF44
                                       + (((signed int)*(unsigned __int8 *)(v2 + a1 + 1) >> 4) | 16
                                                                                               * (*(_BYTE *)(v2 + a1) & 3)));
    *(_BYTE *)(v3 + v4 + 2) = *(_BYTE *)(dword_52AF44
                                       + (((signed int)*(unsigned __int8 *)(v2 + a1 + 2) >> 6) | 4
                                                                                               * (*(_BYTE *)(v2 + a1 + 1) & 0xF)));
    *(_BYTE *)(v3 + v4 + 3) = *(_BYTE *)(dword_52AF44 + (*(_BYTE *)(v2 + a1 + 2) & 0x3F));
    v2 += 3;
    v3 += 4;
  }
  if ( v5 % 3 == 1 )
  {
    *(_BYTE *)(v3 + v4 - 2) = 61;
    *(_BYTE *)(v3 + v4 - 1) = 61;
  }
  else if ( v5 % 3 == 2 )
  {
    *(_BYTE *)(v3 + v4 - 1) = 61;
  }
  return v4;
}
```

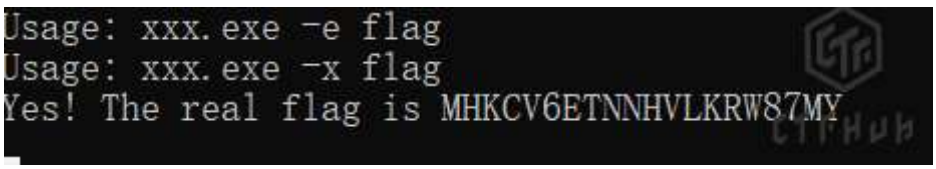
00007580 sub_45A180:1 (45A180)

进一步得出是换了码表的base64，继续跟踪得到码表

```
/+9876543210PUNSLQJOHMFKDIBGZEXCVATYRWjohmfkdibgzexcvatyrwpunslq
```

使用新的码表解密即为flag





Flag

```
1  flag{MHKCV6ETNNHVLKRW87MY}
```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‹ base64 Web2 ›