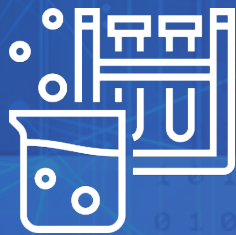


Lab Assignment



© 2022 HackerUSA Inc. d/b/a ThriveDX

Cybersecurity Professional Program

Network Security

Practical Cryptography

NS-05-L2

Rainbow Table

Hash Cracking

Lab Objective

Become familiar with the tools and concepts involved in cracking hashes.

Lab Mission

Crack the provided hash using a rainbow table.

Lab Duration

30–45 minutes

Requirements

- Basic working knowledge of Kali Linux
- Basic Bash command line usage
- Familiarity with basic encryption methods

Resources

- Environment & Tools
 - VirtualBox
 - Kali Linux 2019
 - *rtgen*
 - *rtsort*
 - *rcrack*
- Extra Files
 - *Kali 2019.ova*

Lab Task 1: Kali Linux Virtual Machine

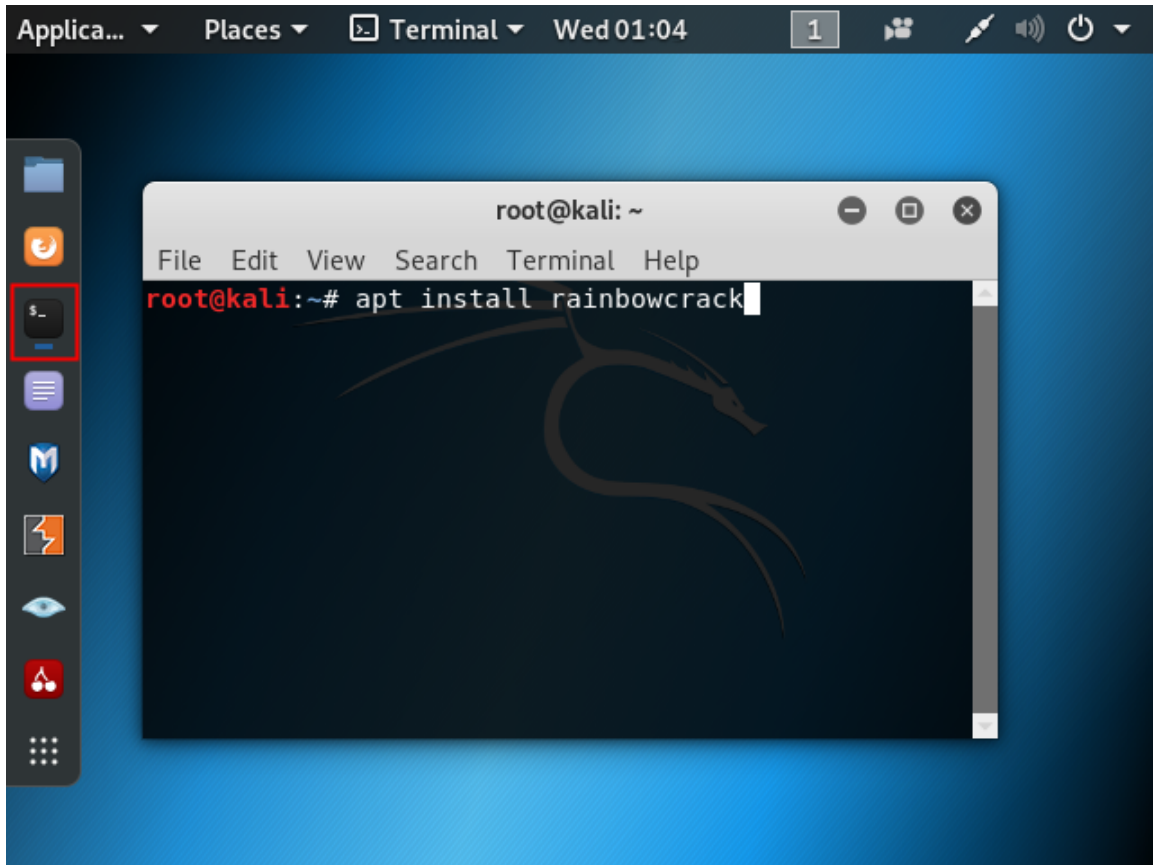
Import Kali Linux **2019.3** OVA to VirtualBox that will be used in this course.

Lab Task 2: Use a Rainbow Table to Crack a Hash

Crack the following hash using a Rainbow Table attack:

74765968c67007219b197f4d9aafb4e2

- 1 Install **RainbowCrack** using the ***apt install rainbowcrack*** command.



- 2 Create a six-number rainbow table of **md5** using the following command structure: **rtgen md5 numeric 1 6 0 1000 4000 0**

rtgen: The binary used for rainbow table creation

md5: The hash type

numeric: The character set to be used, which in this case is numbers

1: The minimum length of the password

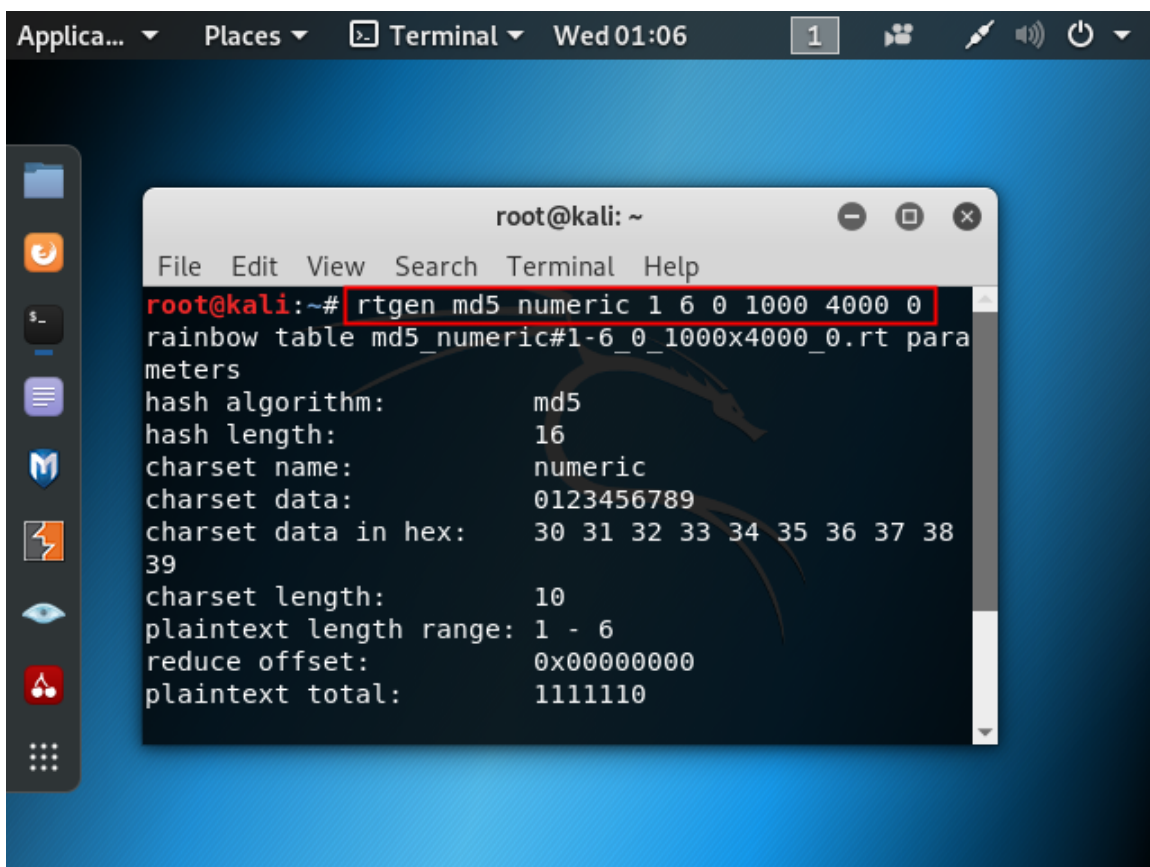
6: The maximum length of the password

0: The reduction function that maps hashed values to plain text values

1000: The length of the chain to generate

4000: The number of chains to generate

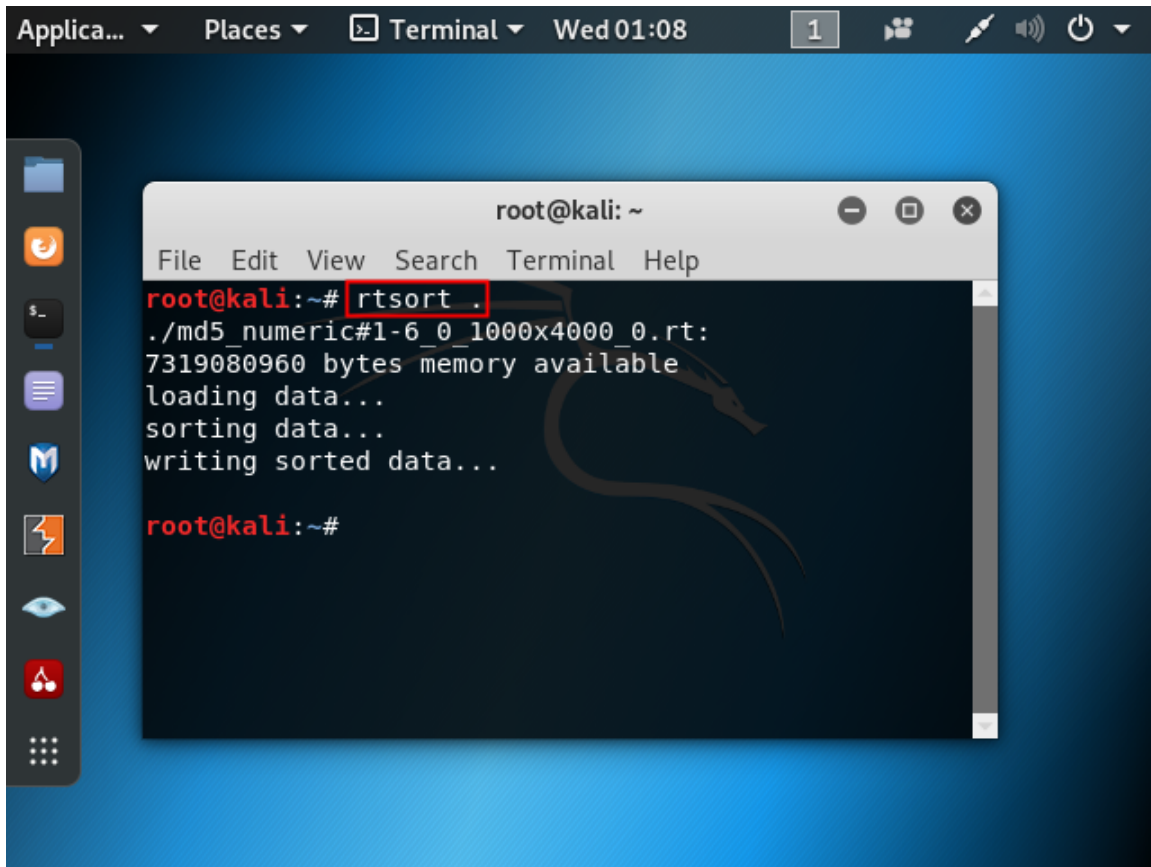
0: How many files the rainbow table will be divided into (in this case, 1)



The screenshot shows a terminal window titled 'root@kali: ~' with a menu bar containing 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The command `rtgen md5 numeric 1 6 0 1000 4000 0` has been entered and is highlighted with a red box. The output of the command is as follows:

```
rainbow table md5_numeric#1-6_0_1000x4000_0.rt parameters
hash algorithm:      md5
hash length:         16
charset name:         numeric
charset data:         0123456789
charset data in hex: 30 31 32 33 34 35 36 37 38 39
charset length:      10
plaintext length range: 1 - 6
reduce offset:       0x00000000
plaintext total:      1111110
```

3 Sort the rainbow table using the *rtsort* command.

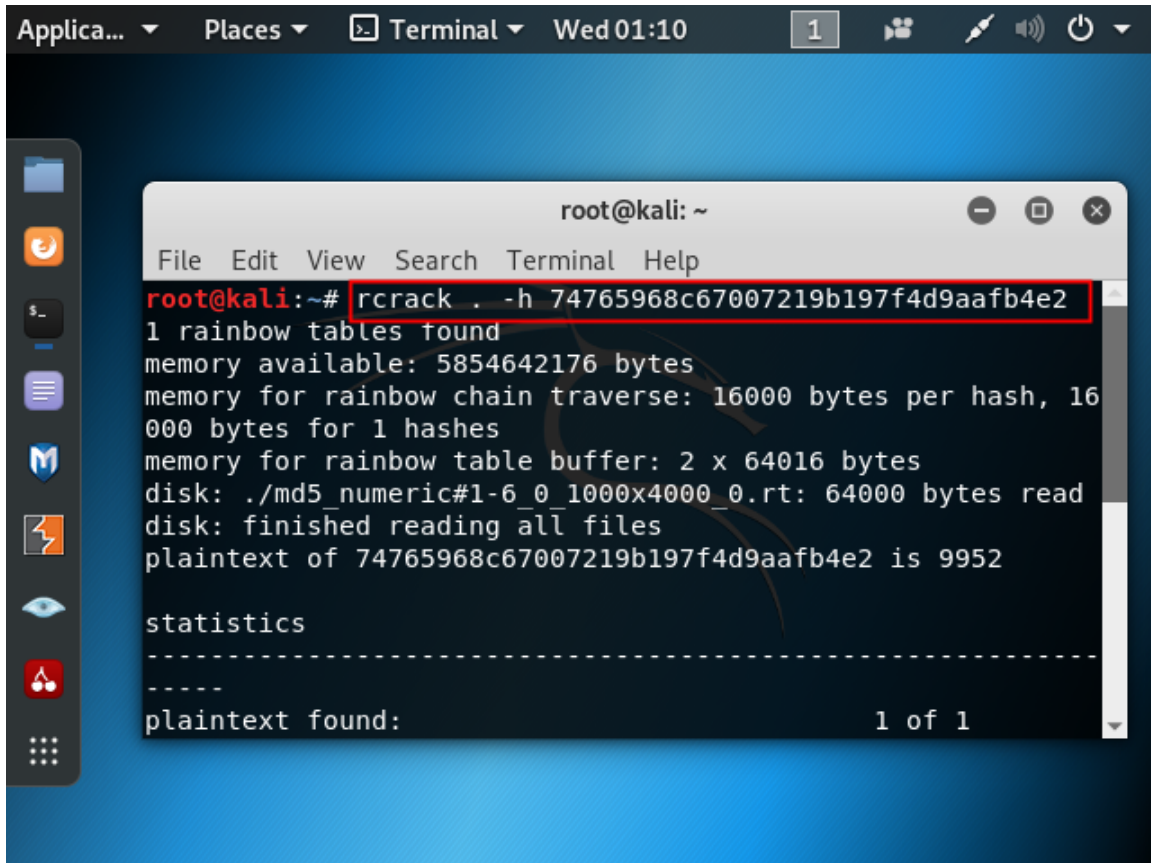


The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal window has a title bar that reads "root@kali: ~" and a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal output shows the command `rtsort .` being executed. The output indicates that the command is processing a file named `./md5_numeric#1-6_0_1000x4000_0.rt`, showing 7319080960 bytes of memory available, and then proceeds with "loading data...", "sorting data...", and "writing sorted data...". The prompt `root@kali:~#` is visible at the end of the output.

```
root@kali: ~  
File Edit View Search Terminal Help  
root@kali:~# rtsort .  
./md5_numeric#1-6_0_1000x4000_0.rt:  
7319080960 bytes memory available  
loading data...  
sorting data...  
writing sorted data...  
root@kali:~#
```

4 Crack the hash using the *rcrack* tool.

Note: To copy the hash to the Kali Linux VM, use the shared clipboard presented in the Kali Linux Installation Guide.



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal window has a title bar that says "root@kali: ~". Inside the terminal, the command `rcrack . -h 74765968c67007219b197f4d9aafb4e2` has been entered and executed. The output of the command is as follows:

```
root@kali:~# rcrack . -h 74765968c67007219b197f4d9aafb4e2
1 rainbow tables found
memory available: 5854642176 bytes
memory for rainbow chain traverse: 16000 bytes per hash, 16
000 bytes for 1 hashes
memory for rainbow table buffer: 2 x 64016 bytes
disk: ./md5_numeric#1-6_0_1000x4000_0.rt: 64000 bytes read
disk: finished reading all files
plaintext of 74765968c67007219b197f4d9aafb4e2 is 9952

statistics
-----
-----
plaintext found: 1 of 1
```