



Password Cracking using Hashcat

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Introduction to Hash

What is Hash

Hash is the simplest type of cryptographic operation which is the result of hashing algorithm.

Hash Algorithm

Hashing algorithm:

1. NT hash
2. MD5
3. SHA 128
4. SHA 256
5. SHA 512

Hash Example

MD5

5f4dcc3b5aa765d61d8327deb882cf99

SHA-256

5E884898DA28047151D0E56F8DC6292773603D0D6AABBDD62A11EF721D1542D8

SHA-512

B109F3BBBC244EB82441917ED06D618B9008DD09B3BEFD1B5E07394C706A8BB980B1D7785
E5976EC049B46DF5F1326AF5A2EA6D103FD07C95385FFAB0CACBC86

Hash Characteristics

- Fixed Length
- One way process
- Same word always gives identical hash value

Salt

Adding random value characters to the hash.

Characteristics:

1. Often is not secret
2. Must be unique to each password

Salt Example

Password: abcde

Salt: K56Khj

Salted Password: abcdeK56Khj

MD5 Hash: 6718dc2b249d3f9cfd1d55f4774718fe

Hash Location

Linux: /etc/shadow

Windows: C:\windows\system32\config\SAM

Active Directory NTDS.dit in %SystemRoot%/NTDS

SQL database

Router

Cracking the Hash

- The most realistic way to crack the hash is by using dictionary or brute force.
- The latter is effective for relatively short plain-text/password
- Dictionary attack itself is divided into different methods
 1. “Basic” dictionary attack
 2. Rainbow attack (pre-calculated hashes)
 3. Mask attack (dictionary + rules)

Tools

Hashcat

JohnTheRipper

Online Tools

Hashcat

Hashcat Strength

- Cracking password using GPU is the trend
- Modular

The Four Arguments of Hashcat

Hashcat -m <hash-type> -a <attack-mode> <file-name> <dictionary>

The four essential arguments are

1. Hash type
2. Attack mode
3. File name (target hashes)
4. Dictionary

First Argument: Hash type

<https://hashcat.net/wiki/doku.php?id=hashcat>

Option = -m, hash type example

1. MD5 = 0
2. NT-Hash = 1000
3. SHA1 = 100
4. SHA-512 = 1700
5. SHA512crypt = Unix

Second Argument: Attack Mode

Option= -a , Attack mode

- 0 = Straight
- 1 = Combination
- 3 = Brute-force
- 6 = Hybrid wordlist + mask
- 7 = Hybrid mask + wordlist

Third Argument: File Name

Replace filename with list of hashes or you can input a single hash here

Fourth Argument: Dictionary

Lab purpose:

1. Rockyou
2. Using your own

Great dictionary for a real password cracking activity:

1. Rockyou
2. Geovedi Indonesian wordlist
3. Danielmiessler SecLists

Demo

Feel Free to Access File

<https://github.com/devismail2y/hashcatlab>

Basic Password Cracking

```
hashcat -m 0 -a 0 BasicPasswordCracking.txt ezwordlist.txt
```

Masking Attack

```
hashcat -m 0 -a 1 BasicPasswordCracking.txt CommonEnglishWords.txt  
BasicPasswordCracking.txt
```

Password Cracking with Rule

```
hashcat -m 0 -a 0 BasicPasswordCracking.txt ezwordlist.txt -r /usr/share/hashcat/rules/dive.rule
```

Brute-Forcing

Basic:

```
hashcat -m 0 -a 3 BasicPasswordCracking.txt ?a?a?a?a
```

Increment:

```
hashcat -m 0 -a 3 BasicPasswordCracking.txt -i ?a?a?a?a
```


Terimakasih

