Gaining Access: Cracking Passwords

The Issue with Passwords

Dale Meredith
MCT | CEI | CEH | MCSA | MCSE
Cyber Security Expert

dalemeredith.com | Twitter: @dalemeredith | Linkedin: dalemeredith|

Love is great, but not as a password

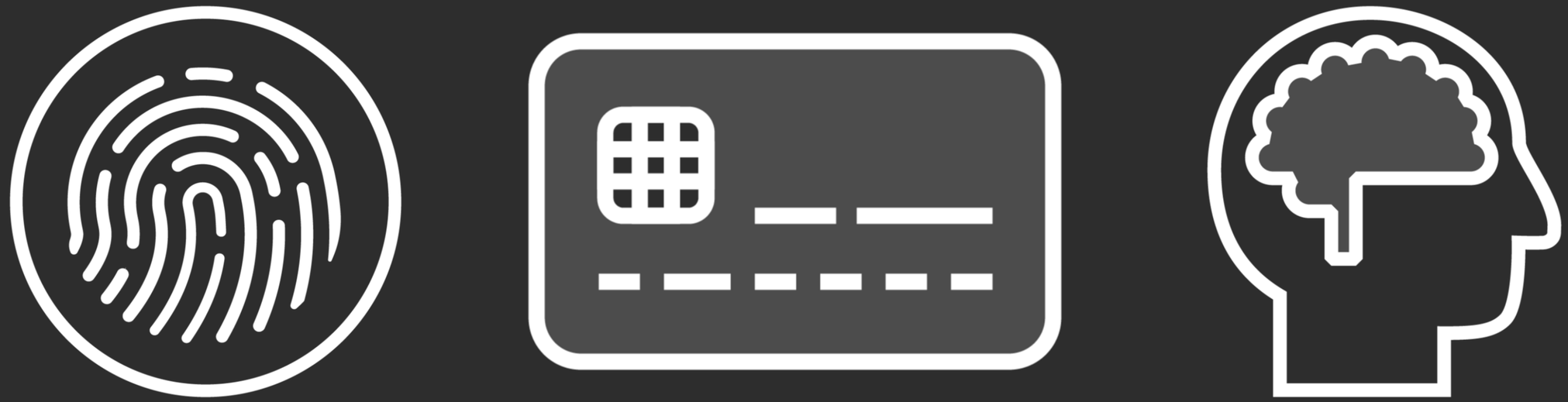
Matt Mullenweb

Issues with Passwords

Grab locally or while in transit

Is there any good reason to crack passwords?

Most users pick something they know



Complexity

Complexity

Upper case

Lower case

Numbers

Special characters

Be Careful!

Using @,$,3,0,! Also known as the “Fab-Five”:

Pa$$w0rd = You’re not fooling anyone

0penm3up = Yeah, right

L3tm3in = I’m gonna pwn you!

B@tm@n   = Although “cool”, won’t fool the Joker!

Demo

Testing password strength

Where Are All the Passwords?

Where Are Passwords Stored?

Windows

- Local machines: SAM Database
  - C:\windows\system32\config\sam
  - Mounted as HKLM/SAM
  - * C:\windows\repair
- Active Directory: ntds.dit
  - C:\windows\ntds

Linux

- Local machines:
  - /etc/shadow

Where Are Passwords Stored?

Apple

- /var/db/dslocal/nods/default/users
- <user>.plist =>ShadowHashData Property

Oh, So I Just Grab Those Files?

Contains authentication credentials

Stored as "Hash values"

One way algorithm

You can't reverse it

Cool. I'm secure then

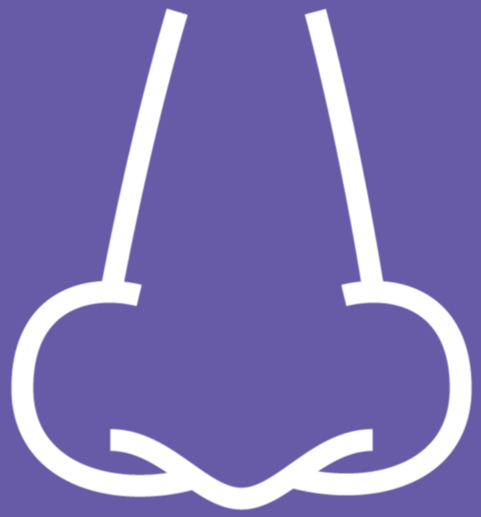
Guess again... I can steal it

Demo

Looking at the SAM and ntds.dit

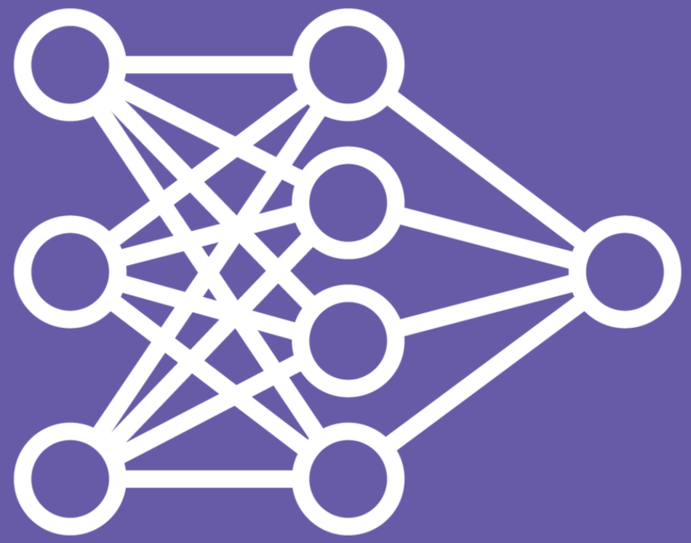
Types of Attacks

Passive



Non-electronic

Offline Attacks



Active Online Attacks

Dictionary Attacks

Text file that you can download

Languages

Subjects

Characters

Famous people, locations, events

String manipulation

Computer = putercom

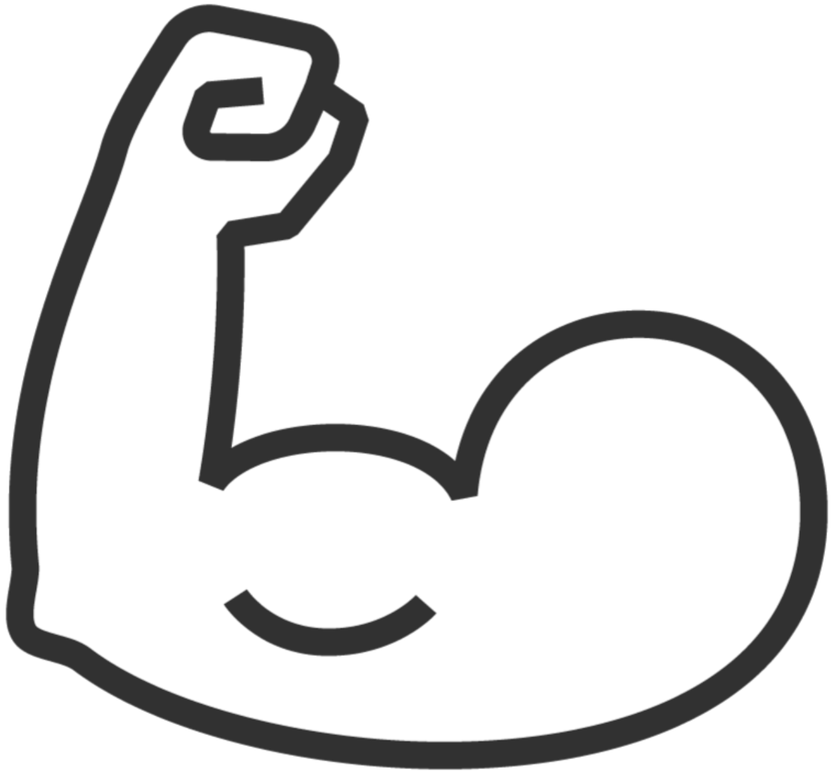
Brute-force Attacks

It does take longer

Tries every combination

More cycles

It's ALWAYS 100% effective



Rule Based Attacks

Remember enumeration?!

Use your rules against you!

8 Characters – Require 2 digits

Combination of Brute-Force, Dictionary and Syllable Attacks

Syllable Attack

Pass
Assp
Sspa
Spas
Pssa
Ssap

Combines Dictionary and Brute-Force

Uses every possible arrangement of every entry in the dictionary

Hybrid Attack

Using a dictionary

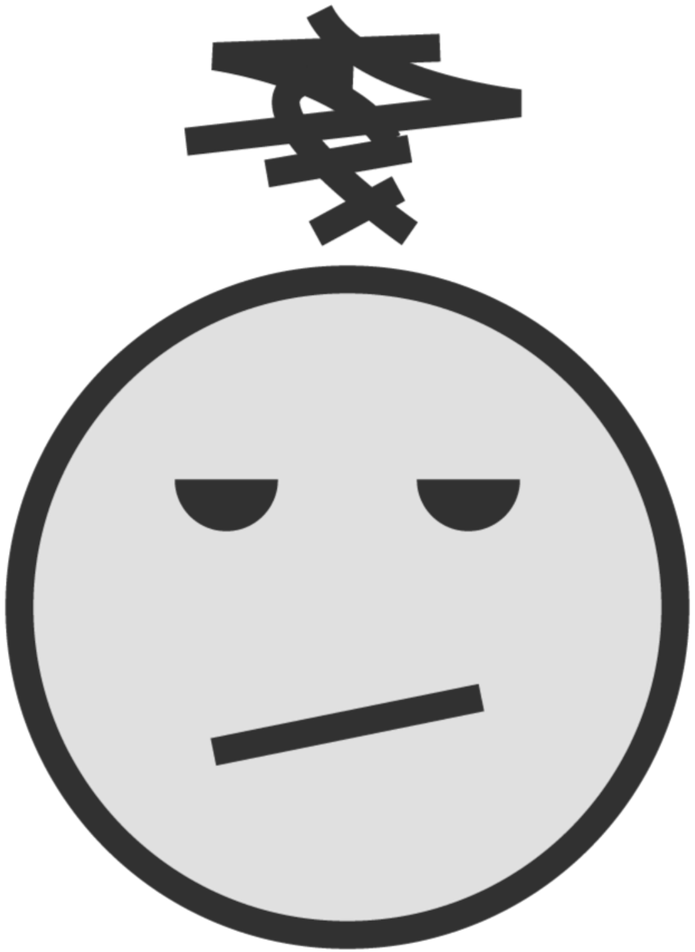
Based on users being complacent

Tries variations by including numbers & special characters

Batman

Batman1

Batman2

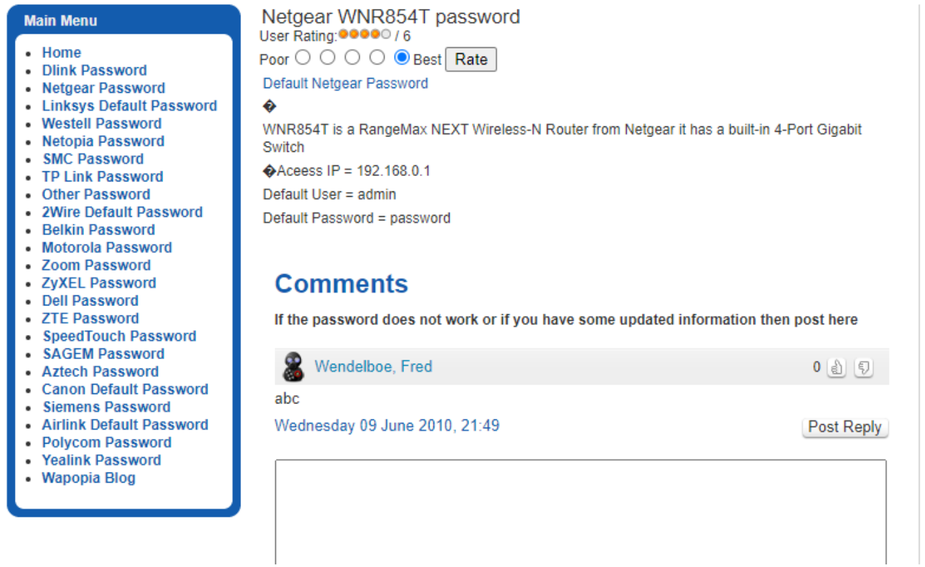


Guessing

Find a user

- List of possible
- Rank them
- Type away

Default Passwords



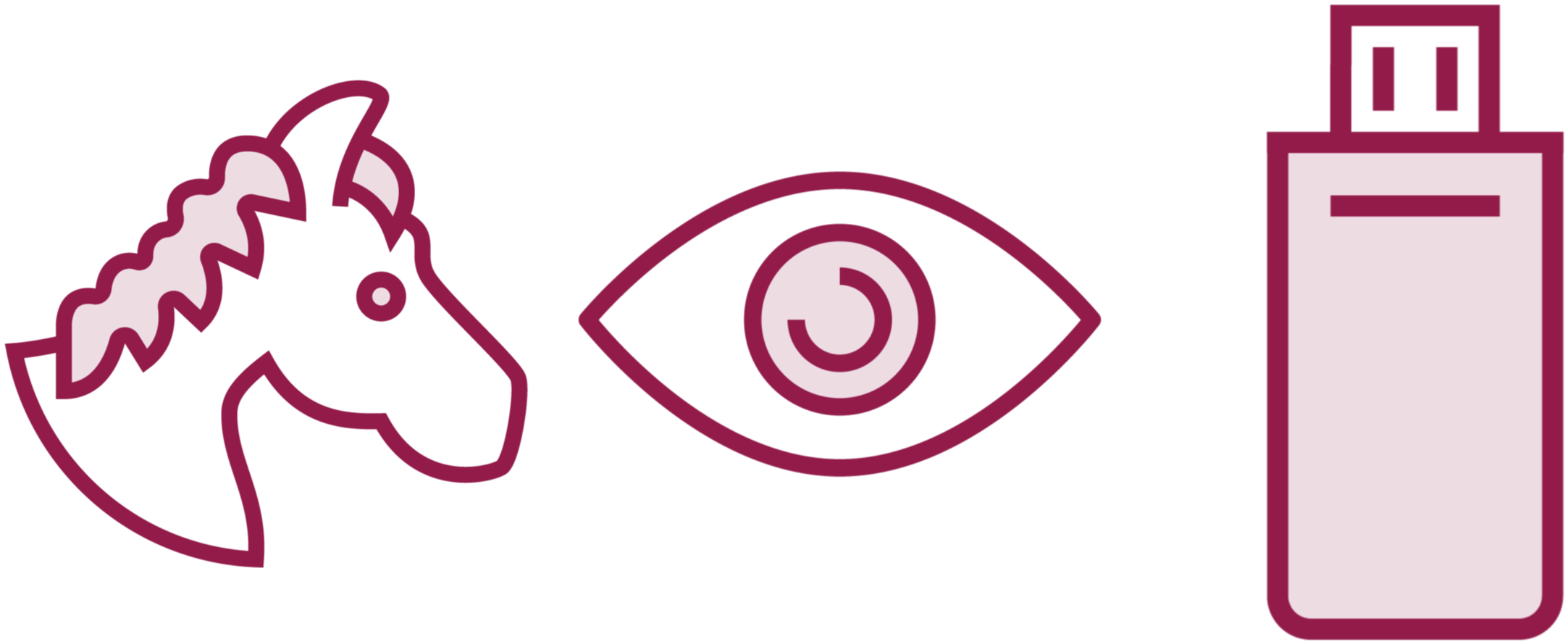
https://www.fortypoundhead.com

https://cirt.net

https://www.defaultpasswords.us

https://datarecovery.com/rd/default-passwords/

Software/Hardware Based



The Hash and Attacks

Hash in the Wild

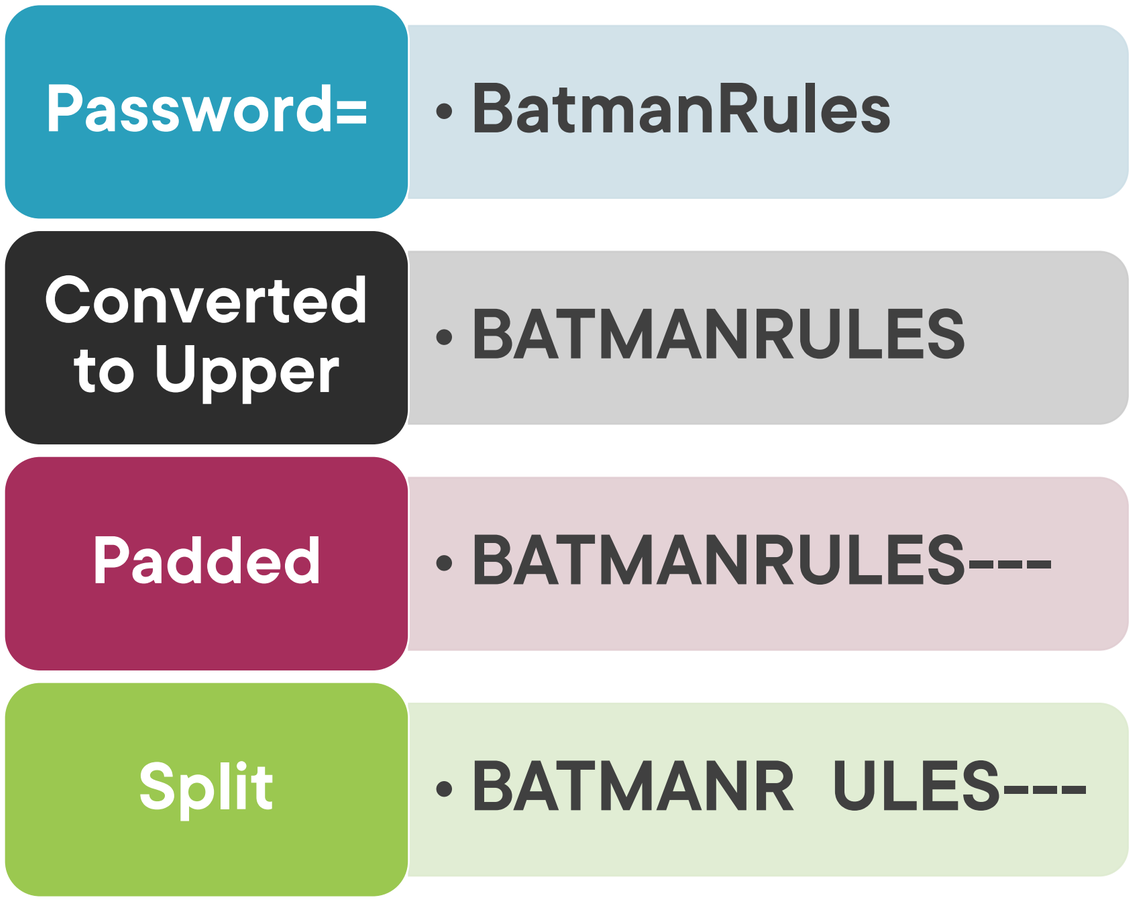
LM Hash/NTLM stores passwords up to 14 characters

All letters are converted to UPPER case

Padded with blank characters to fill out all 14 characters

Then split into 7 character strings

Each 7 character string is then encrypted and combined back



Hash in the Wild

Each 7 character string is then encrypted and combined back

Encrypted

- BATMANR= 86D8D0AEB8D112F8
- ULES--- = F9954FC9DF57E012

Combined

- 86D8D0AEB8D112F8F9954FC9DF57E012

Add NTLM and Stored As:

Bwayne:1005:86D8D0AEB8D112F8F9954FC9DF57E012:ED7B273FDE21FFE559AC8D1B9D3729BC:::

Administrator:500:598DDCE2660D3193AAD3B435B51404EE:2D20D252A479F485CDF5E17D93985BF:::

Guest:501:NOPASSWORD********:NOPASSWORD**********:::**

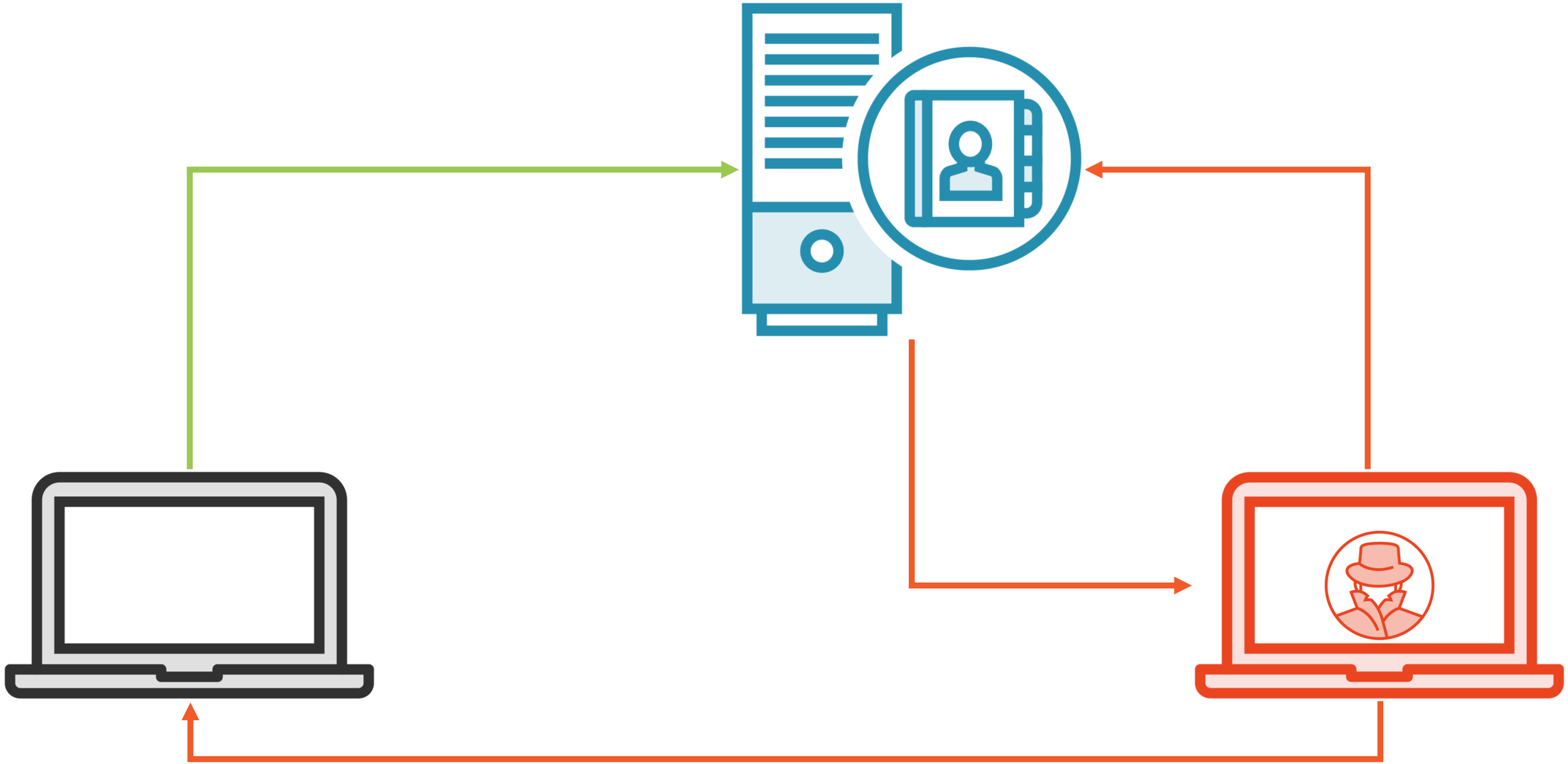
NOTE:

Any hash that ends with: AAD3B435B51404EE means something to you:

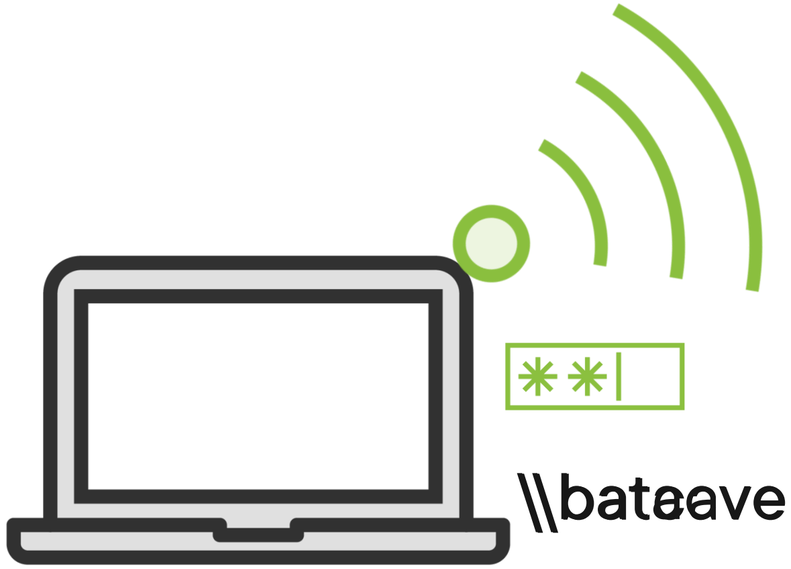
5D567324BA3CCEF8AAD3B435B51404EE = The last seven characters are blank

Any password over 14 characters: the LM Hash value is “dummied” with AAD3B435B51404EE AAD3B435B51404EE

Hash Injection



LLMNR/NBT-NS Poisoning



Why yes, I am \\batacve

Demo

Responder

Learning Check

Learning Check

- Ntds.dit
- /etc/shadow
- SAM
- <user>.plist
- AAD3B435B51404EE

Learning Check

- Non-electronic
- Dictionary
- Brute Force
- C:\windows\system32\config\
- Offline attack

Up Next:
Gaining Access: More Cracking Methods