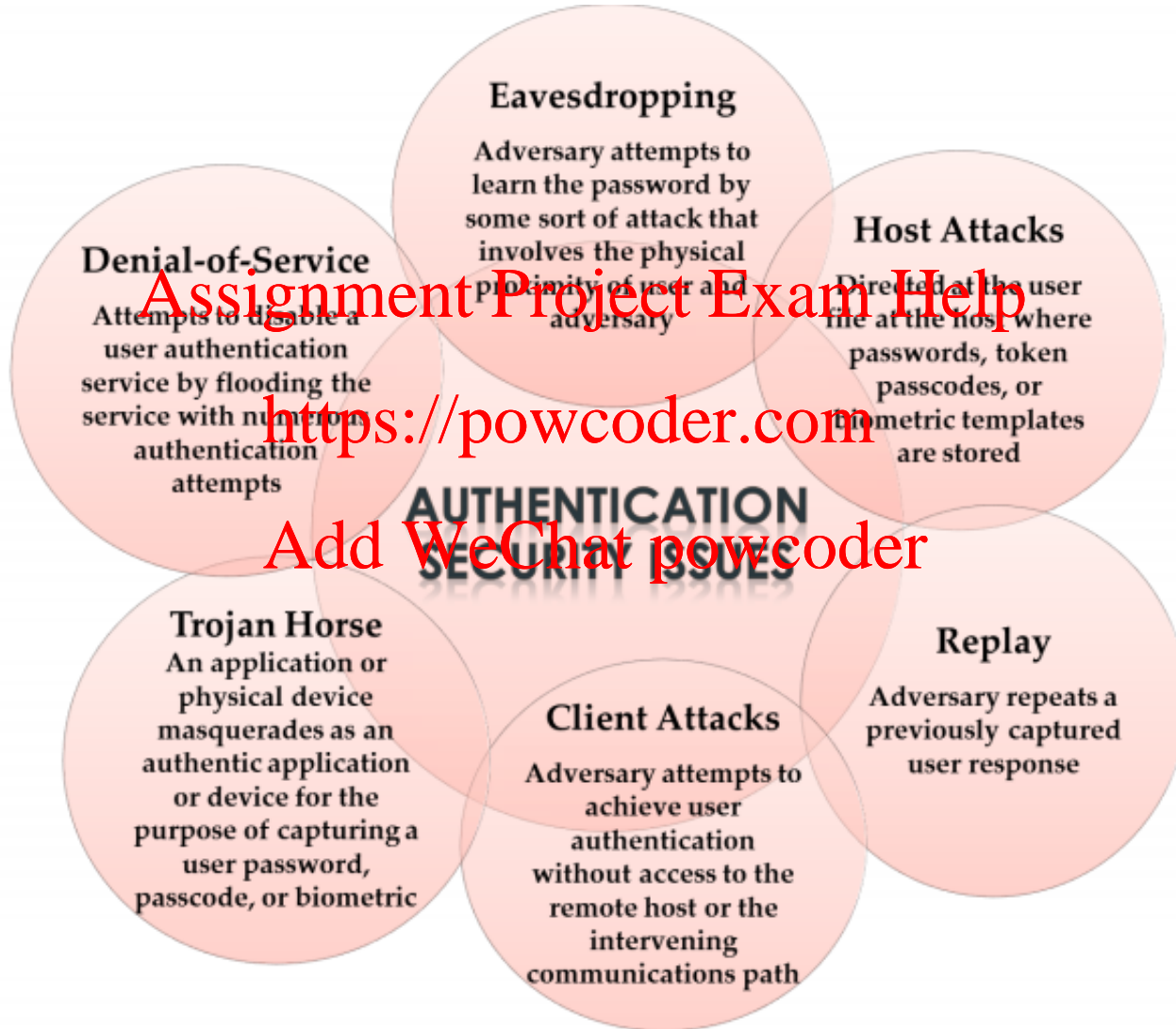


# Authentication (cont.)



# Authentication (cont.)

## Example: Attacks on password-based authenticat. systems

breaking  
(try to 'get  
into' the  
system by  
using a  
legitimate  
password)

disabling  
(prevent  
others  
from get-  
ting into  
the system)

Attacks	Authenticators	Examples
Client attack	Password	Guessing, exhaustive search
Host attack	Password	Plaintext theft, dictionary/exhaustive search
Eavesdropping	Password	"Shoulder surfing"
Replay	Password	Replay stolen password response
Trojan horse	Password	Installation of rogue client or capture device
Denial of service	Password	Lockout by multiple failed authentications

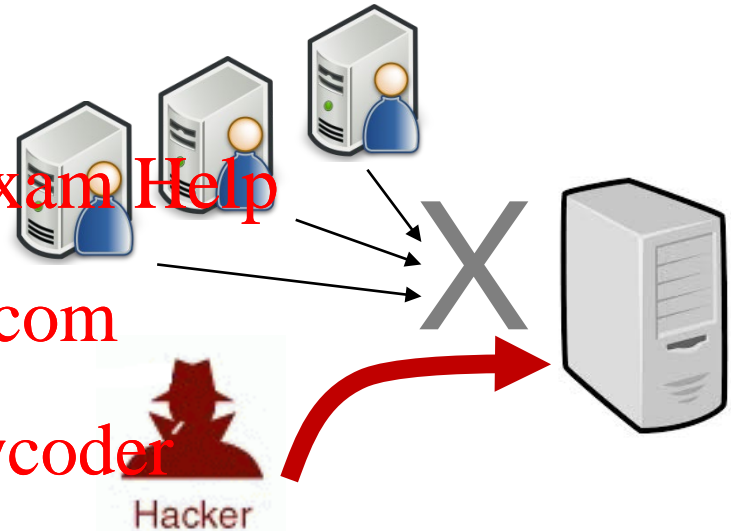
For attacks on other types of biometrics systems –  
check the textbook!!!

# Authentication (cont.)

## Example: Standard vs. Targeted DoS Attacks

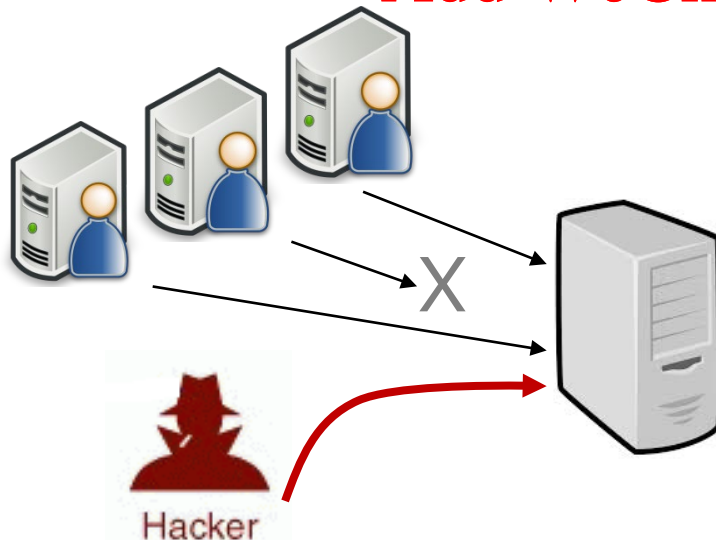
### Standard DoS Attack

Attacker's goal is to prevent victim-server from providing access/service to all legitimate user.



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### Targeted DoS Attack

Attacker's goal is to prevent one particular victim-user from obtaining access/service from a server.

Most systems 'lock-out' a user after multiple login attempts using false password ....

# Authentication (cont.)

## Example: Single- and multi- factor authentication

Systems that use one authentication credential (e.g. something you know) are known as **one-factor authentication systems**.

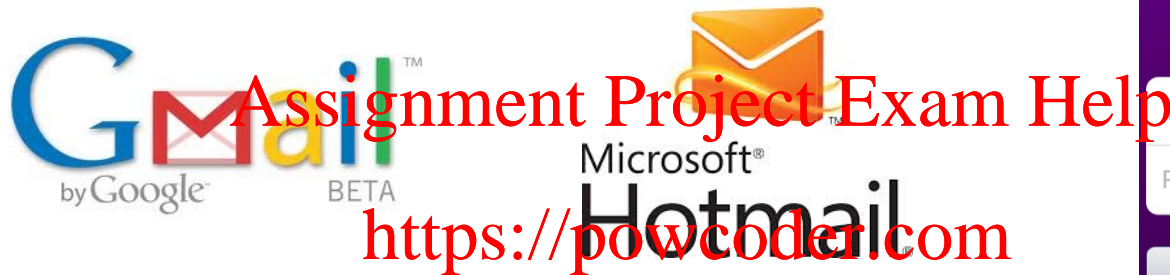
Most computer systems / applications are one-factor authentication systems – they rely on passwords only.

Systems that require strong protection typically combine multiple authentication mechanisms – e.g. something you have and something you know. They are known as **two-factor authentication systems**.

For example, access to a bank's ATM requires a banking card + a personal identification number (PIN).

# Authentication (cont.)

Example: Are Gmail, Hotmail, Yahoo 1- or 2- factor authentication systems?



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Signing in to your account will work a little differently

- 1 Enter your password**  
Whenever you sign in to Google, you'll enter your password as usual.
- 2 Enter a verification code**  
Then, you'll be asked for a code that will be sent to your phone via text, voice call, or our mobile app.

<http://www.google.ca/landing/2step/>