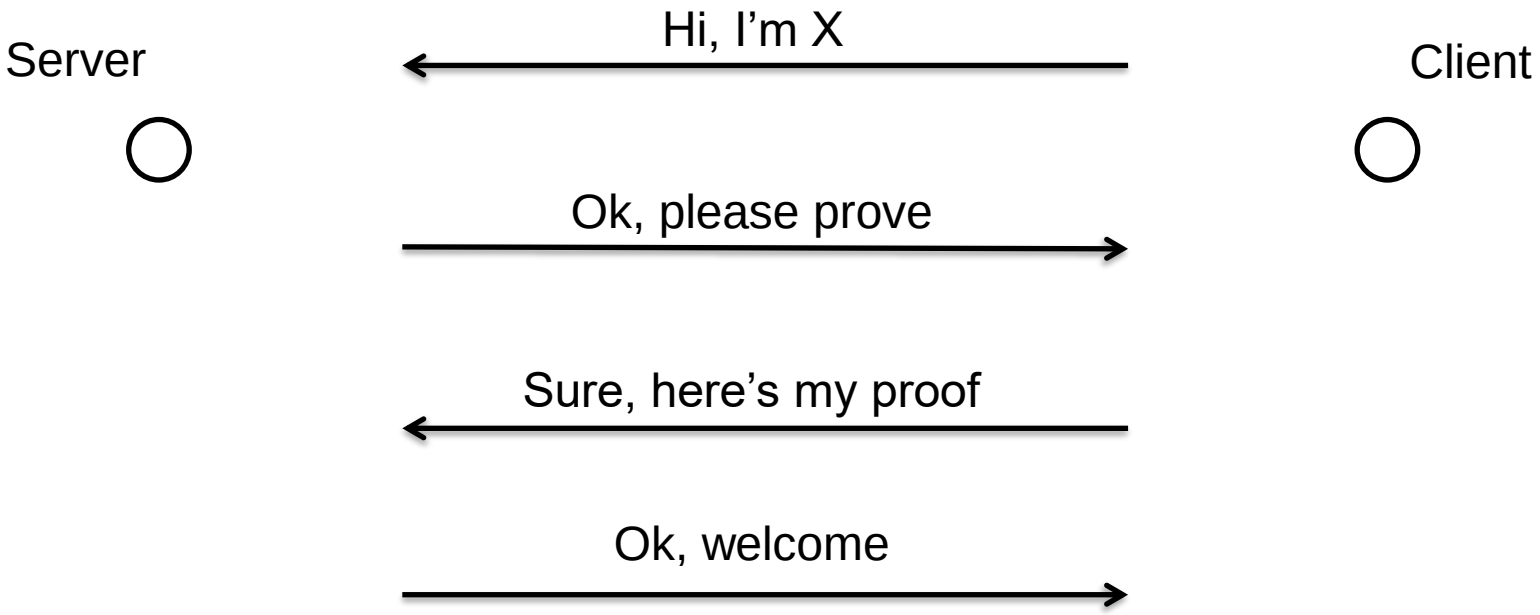
UNIVERSITY OF TWENTE.

Authentication

Topic of Software Systems (TCS module 2)

Lecturer: Maarten Everts

WHAT IS AUTHENTICATION? (INFORMAL)



PROVING YOU'RE YOU: FACTORS

Something the user *knows*

Something the user *has*

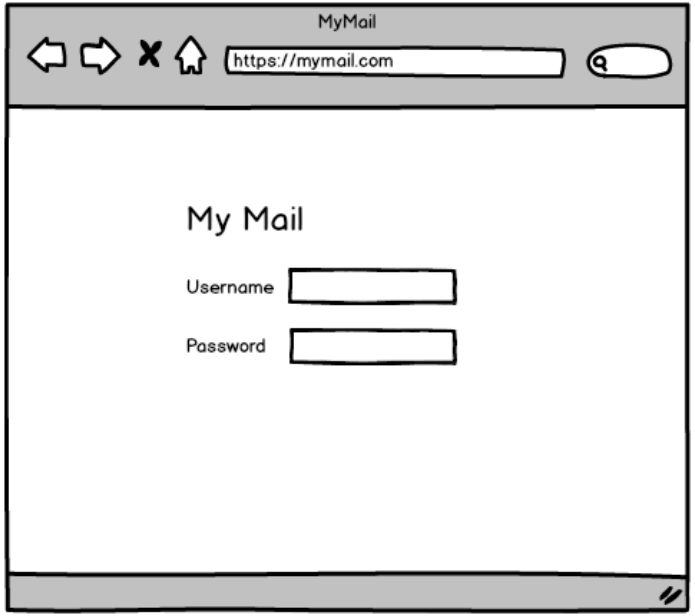
Something the user *is*

Combine for stronger authentication:
Multi-factor authentication

SOMETHING THE USER *KNOWS*

Pincodes,
passwords
&
passphrases

PASSWORDS: THE GOOD



Simple & understandable

Familiar & widespread

Portable

Cheap to implement

PASSWORDS: THE BAD

Re-use across domains

Managing

Too simple passwords

Phishing & sniffing

SOMETHING THE USER *HAS*

Essence:

Having *access* to a secret

Many variants:

Type of secret
- Shared symmetric key
- Private key of a asymmetric key pair

Additional protection
- Separate device
- Tamper-proof hardware (token)
- Pin/password protected

Challenge-response vs. synchronous

RSA SecurID token

- Hardware token
- Tamper-proof
- Synchronous
- Shared symmetric key (seed)
- Sometimes called:
  One Time Password (OTP)

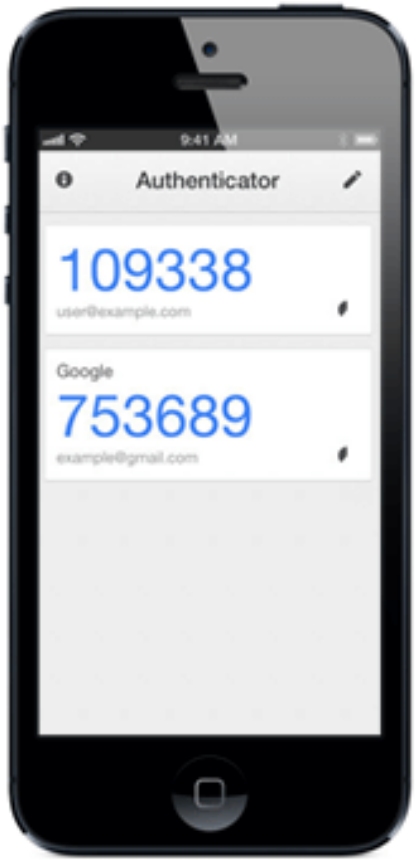
yubico’s YubiKey

- Hardware token
- Tamper-proof
- Synchronous
- Shared symmetric key

http://www.yubico.com/

A bank’s access token

- Hardware token
- Tamper-proof
- Challenge-response
- Shared symmetric key
- Pin-protected



Google Authenticator

- Separate device (mobile)
- Synchronous
- Shared symmetric key

SOMETHING THE USER *IS*

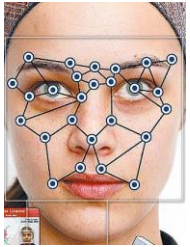
Main idea: using unique personal attributes for authentication

Downsides:

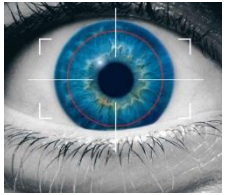
- Intrusive
- Hard to replace
- False positives & negatives
- Complex & expensive

fingerprint

hand geometry



facial scan



iris scan

retina scan

palm scan

voice print

signature dynamics

keyboard dynamics

SECURITY PROPERTIES?

Confidentiality

Integrity

Availability

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