
# Working principle, attacks and defenses of SSL/TLS

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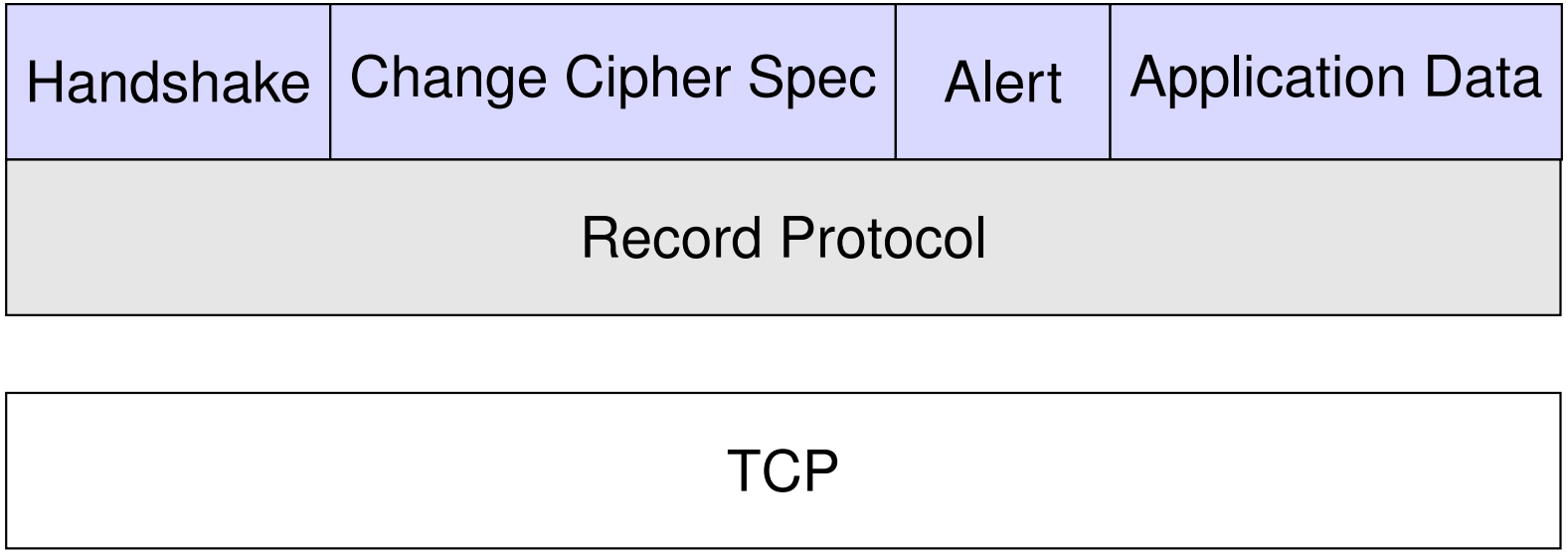
# Agenda

1. Transport Layer Security
2. University teaching
3. Simulating protocols

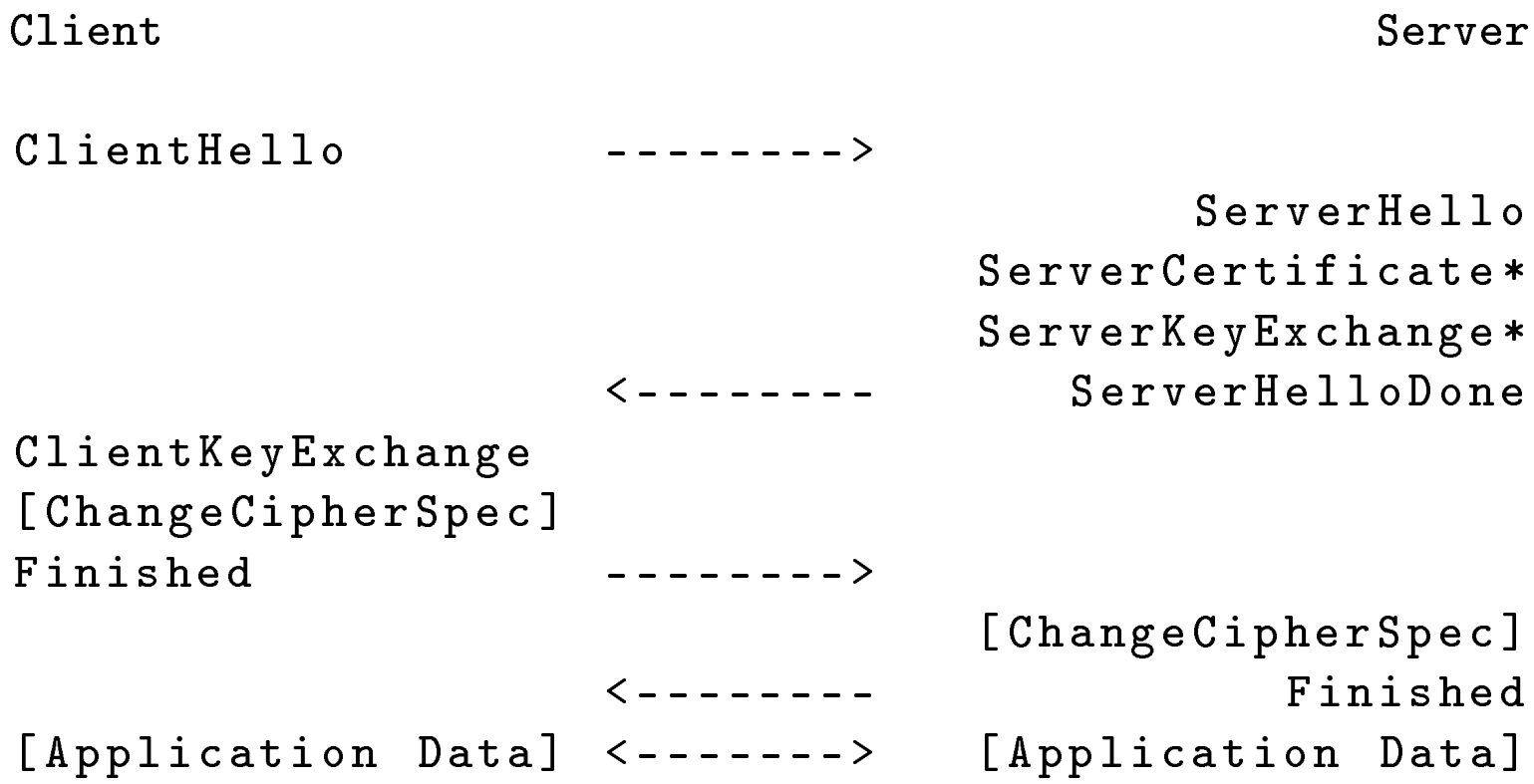
# TLS Overview

- authentication of communication partners, encryption and integrity check of sent messages
- widely used in HTTPS, SFTP, SMTPS, ...
- developed as a part of netscape navigator in the early 90s (1994) as SSL (v1, v2, v3) and was soon used in other browsers and applications
- 1999 IETF standardized it as TLS 1.0
- current 1.2, 1.3 in progress

# Protocol hierarchie



# Message flow




*Based on the TLS 1.2 specification, RFC 5246.*

# Cipher suites

TLS_RSA_WITH_AES_128_CBC_SHA

TLS_DHE_RSA_WITH_AES_128_GCM_SHA256

## Didactic reduction (?)

- concrete methods (like protocols) should be abstracted
- long-lasting principles, which are used in multiple fields

  - hybrid cryptosystems
  - authenticated key exchange
  - side-channel attacks
  - cryptographic principles

## Explorative learning

- discovering and studying a topic by oneself
- useful for complex topics, which are hard to understand with other learning materials
- requires appropriate software: often simulations are used = interactive computer programs modelling activities, which enable us to observe normally hidden processes

## Developed application

- application for simulating two party protocol flows
- extendable (requirement)
- TLS plugin
- not implemented in TLS plugin (?) p. 39

## Live demo

- cipher suite chosing
- server/client views
- start connection
- message and message details view
- info view
- finish handshake
- edit bytes and watch occuring error
- echo plugin (?)

## Conclusion

whatever