Cybersecurity

Linde Nouwen

KdG Karel de Grote Hogeschool

CyberSecurity Intro

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CyberSecurity Intro

General Introduction

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Intro

- “The best defense is a good offense.”
- Learn to think & act like a hacker.

Intro

If you want to test your abilities on life machines:

- Rule1: get permission
- Rule2: get permission
- Rule3: …

Intro

If you want to test your abilities on live machines:

- Rule1: get permission
- Rule2: get permission
- Rule3: make sure you have permission (and keep things confidential and secret)

Intro

"With great power comes great responsibility"

Intro

"With great powers come great responsibilities"

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Dilemmas

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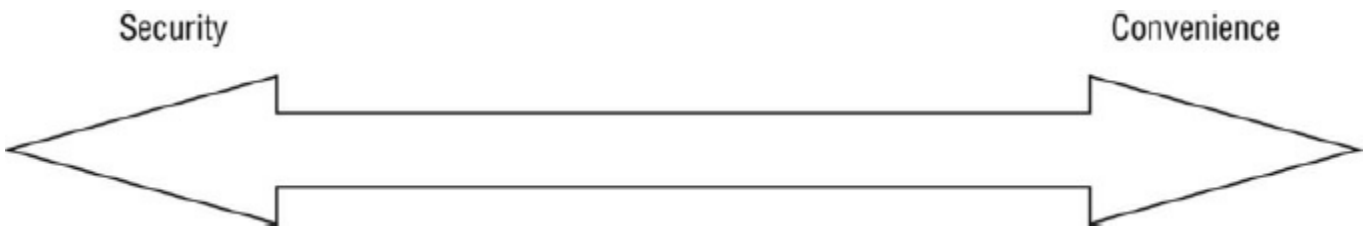
Intro

- The Security/Convenience dilemma



Intro

- System-Goals from Network Security point of view:

- CIA-Triangle
  - Confidentiality
  - Integrity
  - Availability

Intro

- System-Goals from Network Security point of view:

- Hacker tries to break the triangle
- System engineer tries to keep the triangle intact

Intro

- System-Goals from Network Security point of view:

When the triad fails the CIA triad becomes the DAD triad.

Intro

- More "complete" model: (Parkerian Hexad)

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Technical Knowledge and Insight

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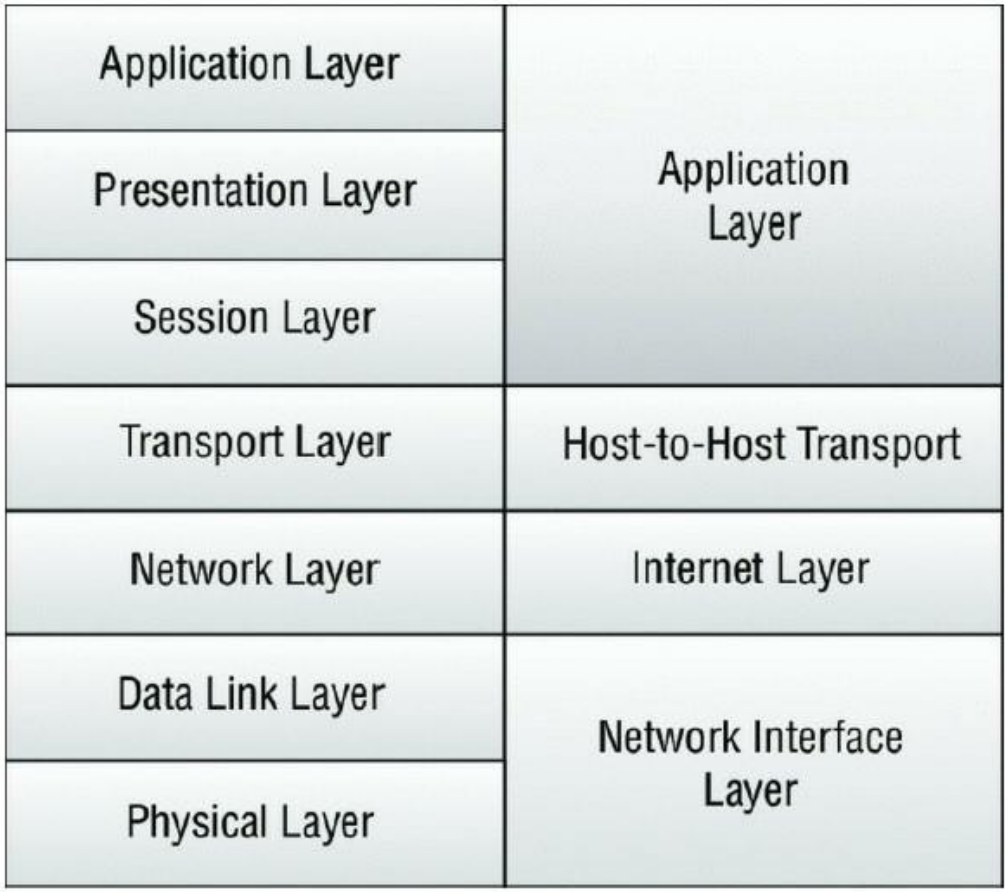
Intro

- Technological knowledge
  - OSI model
  - TCP/IP:
    - Addressing
    - Subnetting
    - Sockets
    - Protocols (DNS, ARP, HTTP, SMTP, DHCP, …)
  - OS
    - Concepts
    - Mgmt (Linux/Windows)

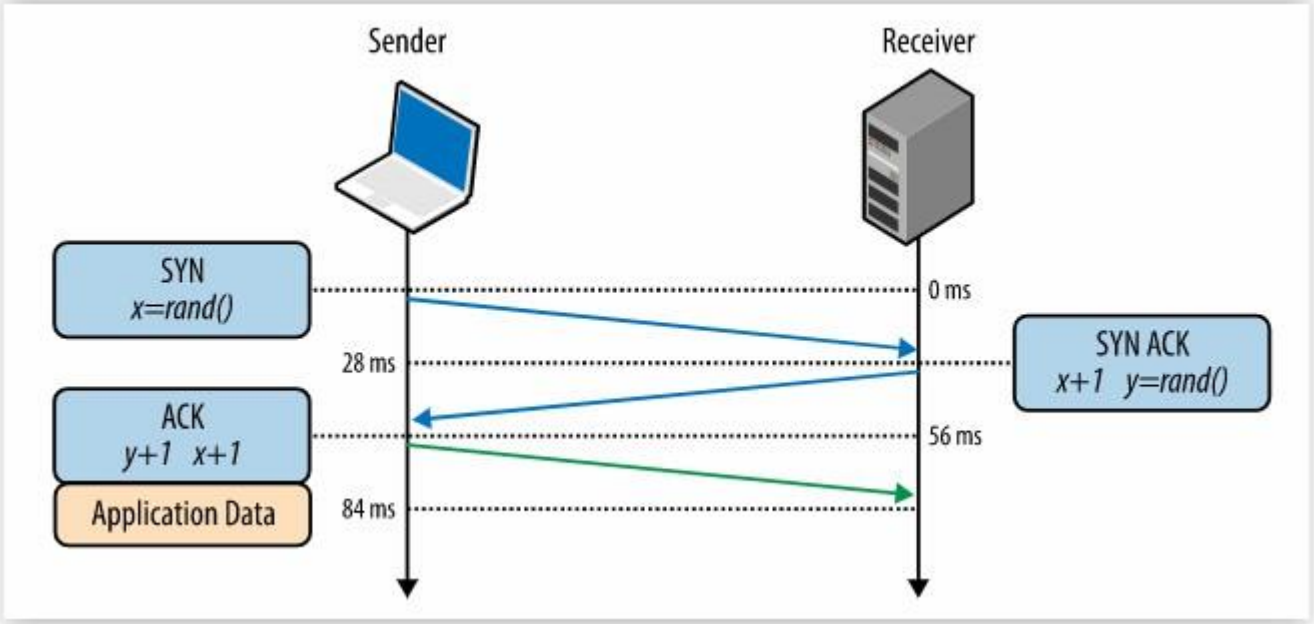
Intro

- Technical Knowledge
  - OSI-Model:



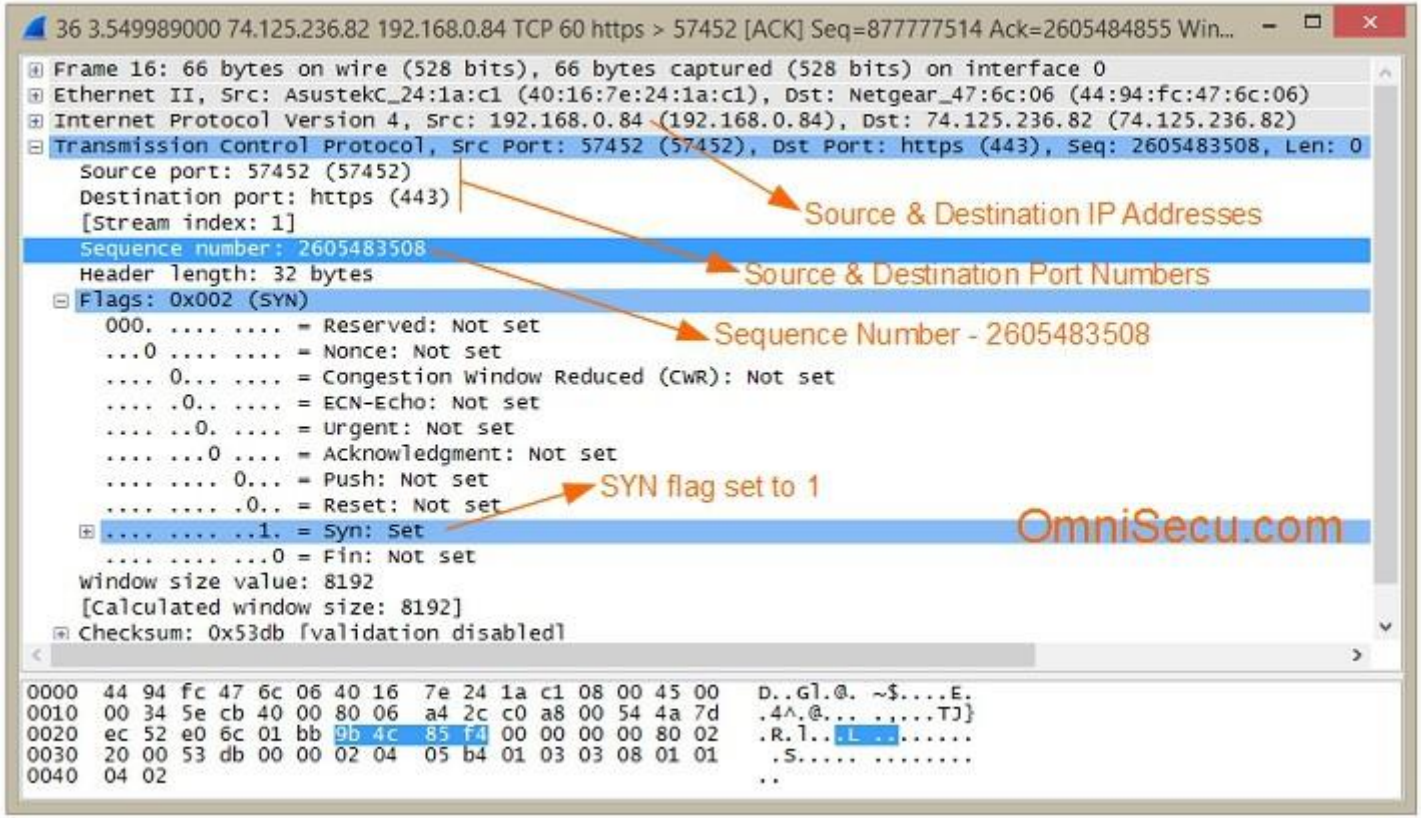
Intro

- Technical Knowledge
  - TCP Sequencing & 3-way handshake



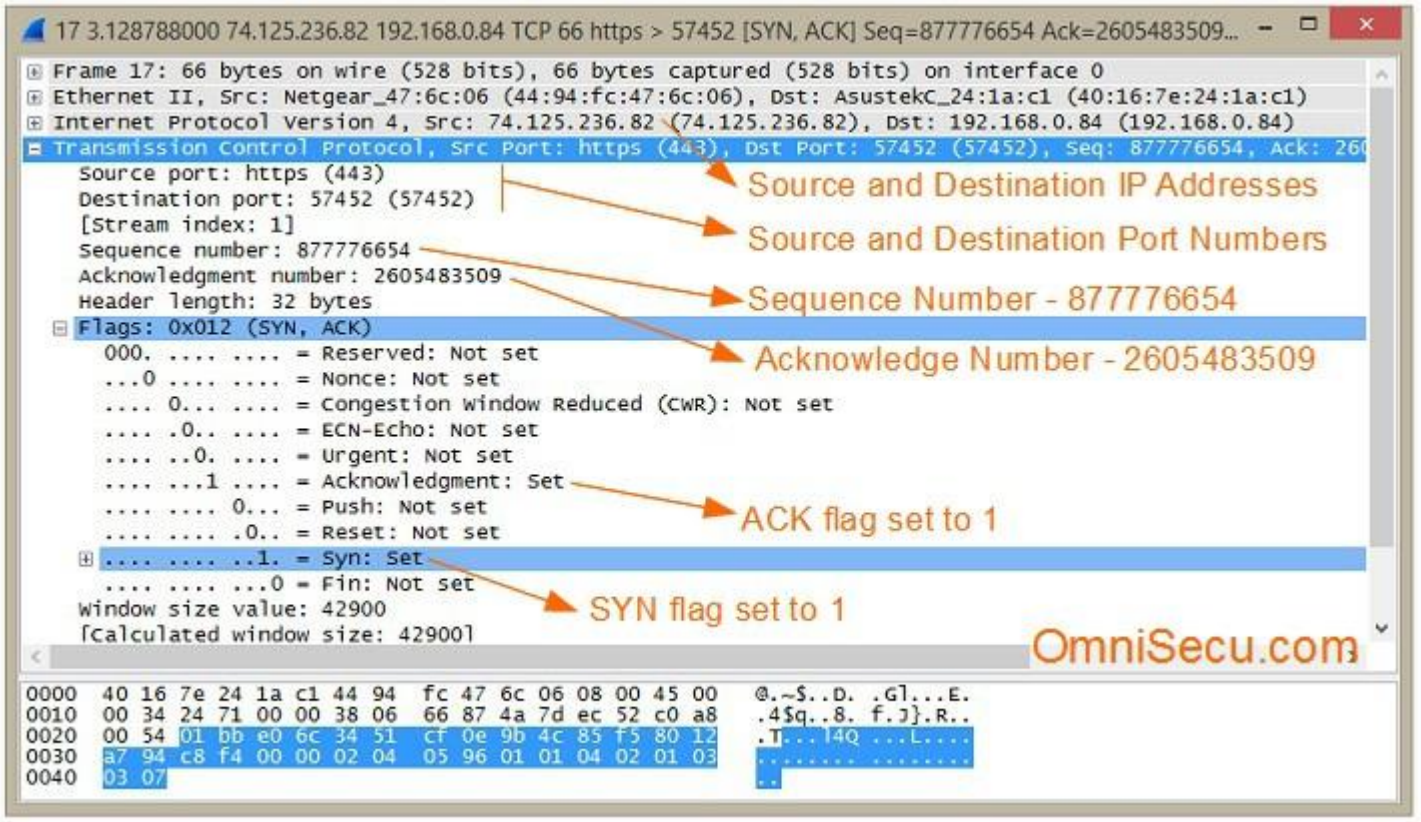
Intro

- Technical Knowledge
  - TCP Sequencing & 3-way handshake
  - SYN



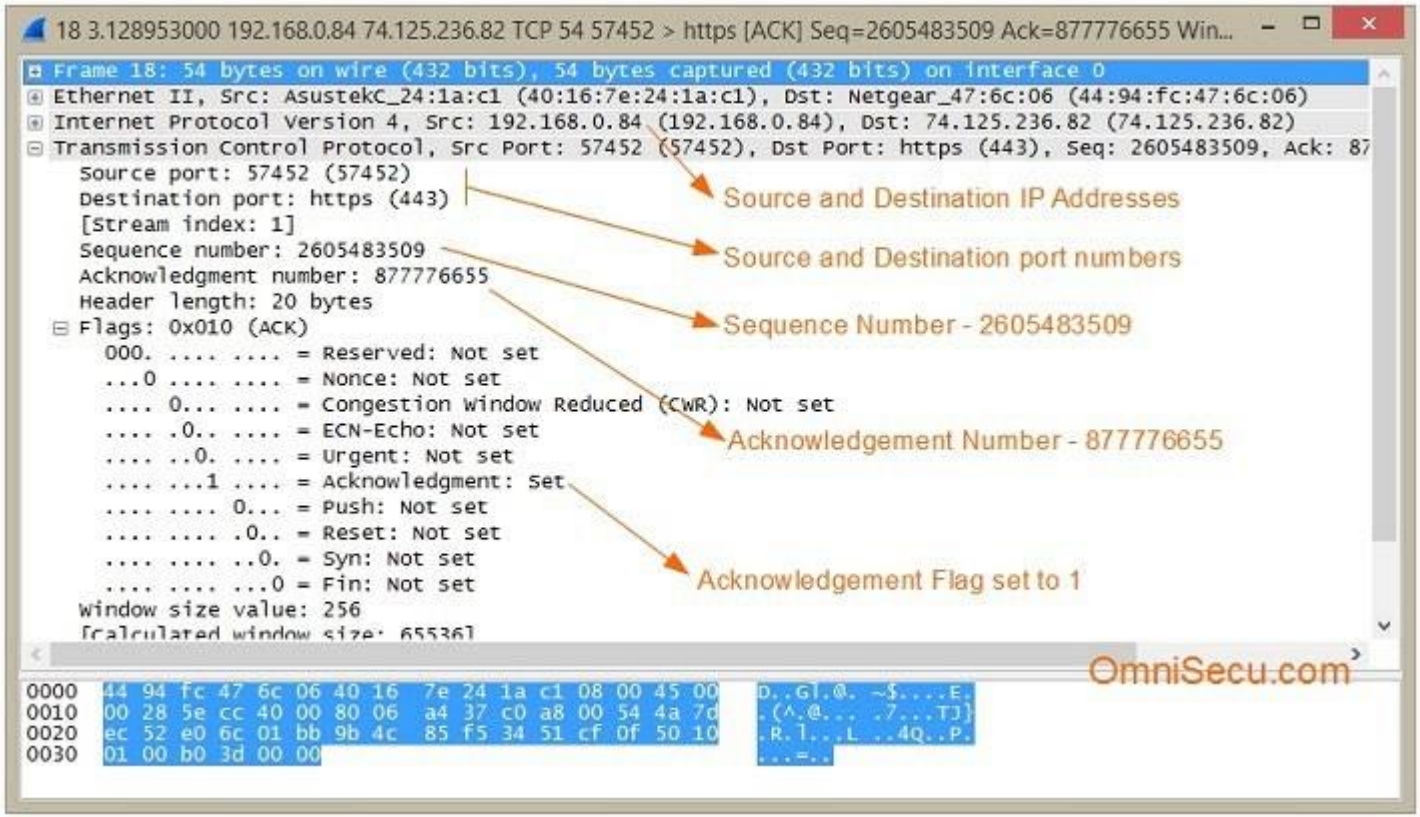
Intro

- Technical Knowledge
  - TCP Sequencing & 3-way handshake
  - SYN + ACK



Intro

- Technical Knowledge
  - TCP Sequencing & 3-way handshake
  - ACK

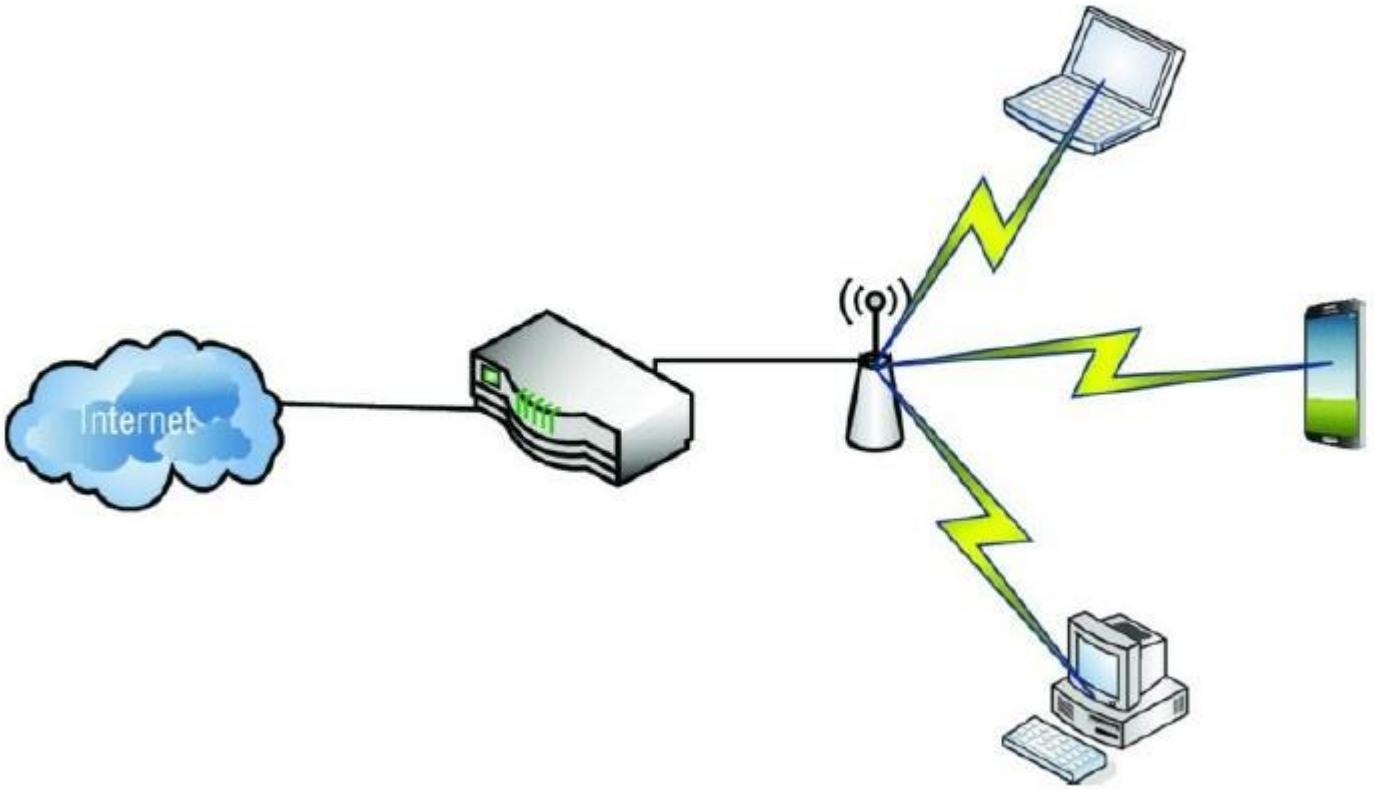


Intro

- Technical Knowledge
  - Subnetting
  - IP & Port = Socket
  - https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers
  - Switch vs Router

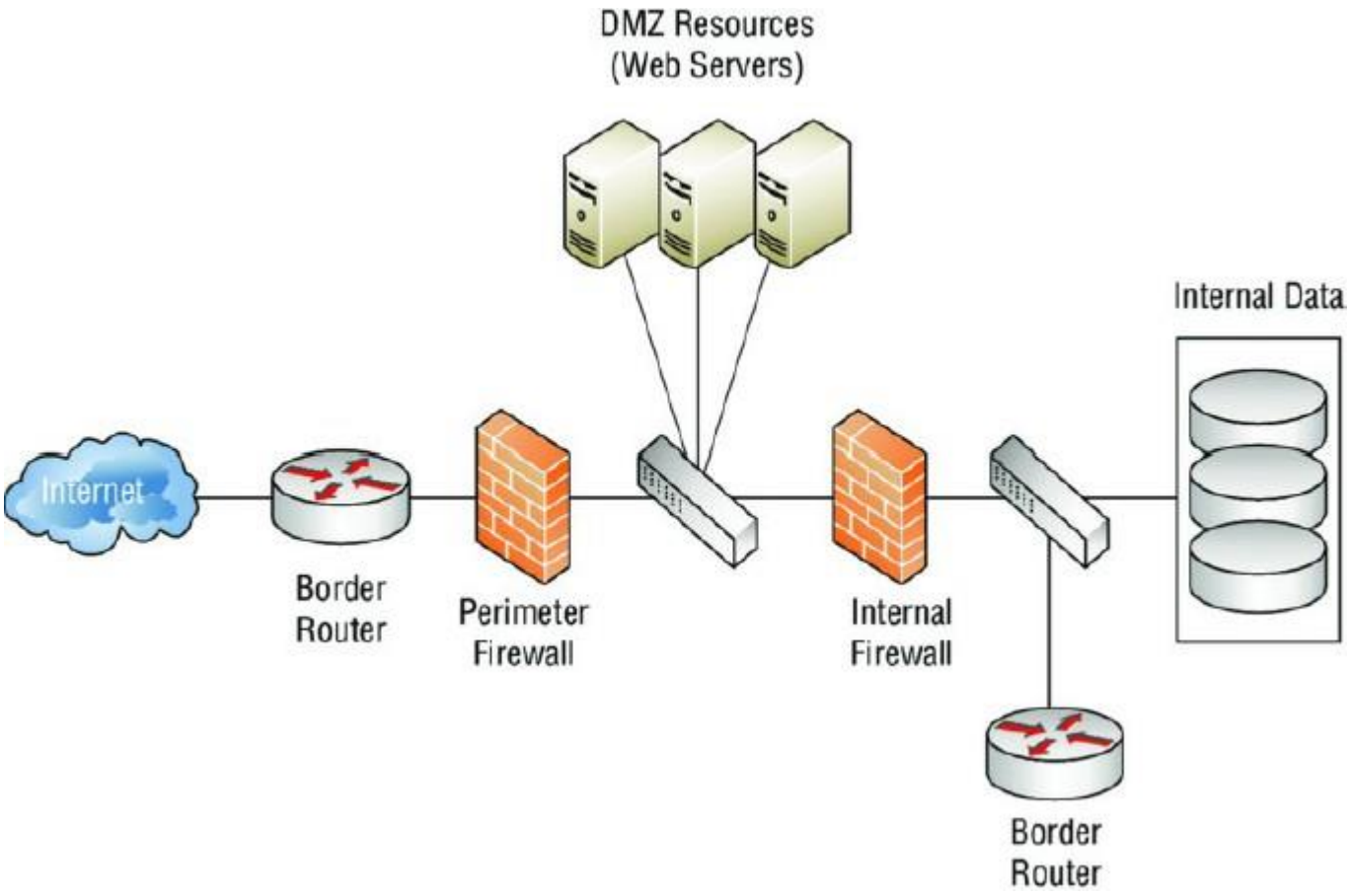
Intro

- Technical Knowledge
  - Diagrams: home network



Intro

- Technical Knowledge
  - Diagrams: company network



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Methodology

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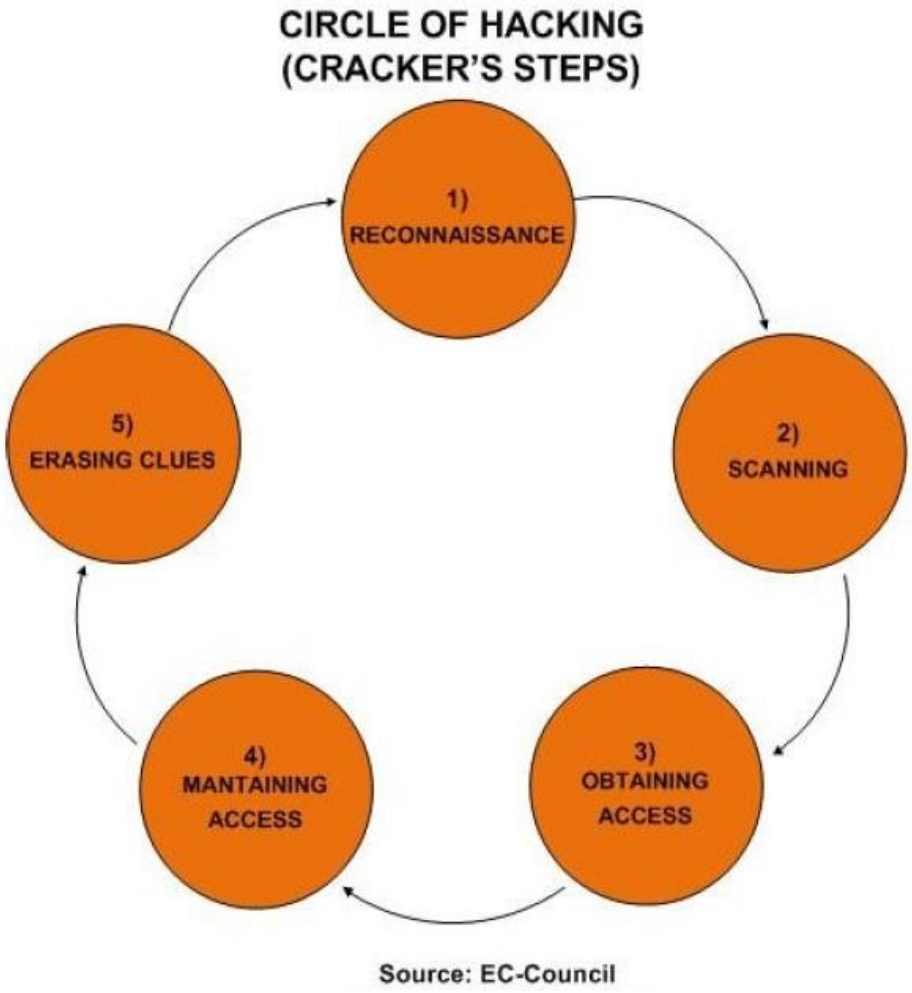
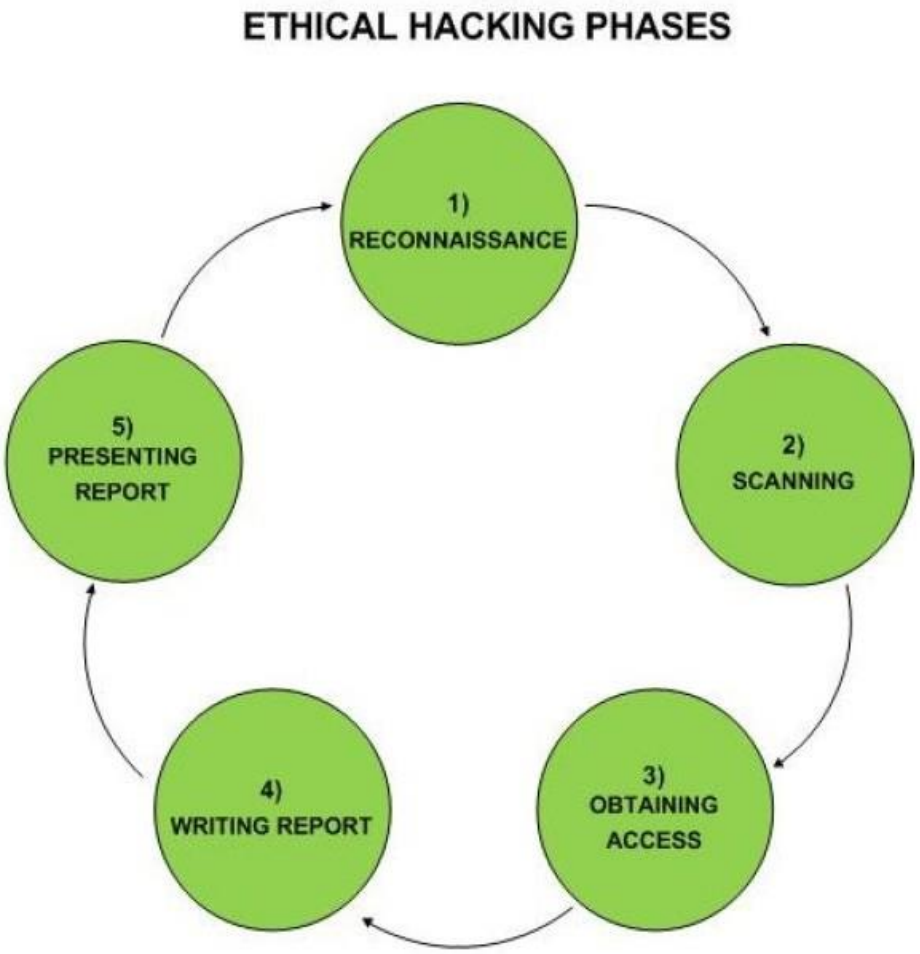
- Cracker/Hacker



Intro

- Security Advisor or Ethical Hacker



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Terminology

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- Terminology
  - To discuss with clients, peers, authorities, etc…
  - Mode in which to operate
  - Services to be provided

Intro

- Terminology
  - Hacking Types:
    - Red teaming
    - Purple teaming
    - External Pentesting
    - Internal Pentesting
    - Physical Pentesting
    - …

Intro

- Terminology
  - Hacking Modes:

- Black Box
  - External
  - Organisation name & let's go…
- White Box
  - Internal (connection and/or access)
  - Lots of internal information: schematics, addresses, … (from client)
- Grey Box
  - In between
  - Client provides some information
  - Some form of access: e.g. employee-like access
- + Script Kiddies & Suicide Hackers & Hacktivists & …

Intro

- Terminology
  - Hacking Services:
    - Social Engineering
    - Wardialing
    - Wardriving
    - Stolen equipment simulation
    - Physical security

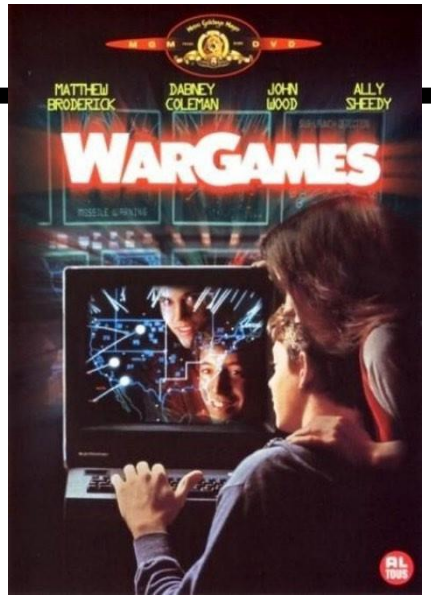
Intro

- Social Engineering
  - Six key principles of human influence
    1. Reciprocity
    2. Commitment and consistency
    3. Social proof
    4. Authority
    5. Liking
    6. Scarcity

Intro

- Social Engineering
  - Four methods:
    1. Phishing
    2. Vishing
    3. Smishing
    4. Impersonation

Intro



- Wardialing
  - For reference only?
  - Old = from modem-times
  - But sometimes “modems” still used as backup strategy

Intro

- Wardriving
  - Off-premise wireless network scans or attacks
  - E.g. car + laptop + signal booster
  - More information: https://www.wigle.net/

Intro

- Stolen equipment simulation
  - Confidential information on mobile devices
  - Check safety/encryption
  - Backup OK?

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- Physical security
  - From simple inspection
  - To infiltration & placement of spy-devices

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Beyond the technical…

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- First step…
  - Proposal creation:
    - Scope & Deliverables
    - Time
    - Cost
- Last step…
  - Reporting
    - Documentation
    - Presentation