Network Security (NetSec)

Summer 2015
Chapter 00: Organization & Introduction
Module 02: Contents

Image source: http://banksystreetart.tumblr.com/

Prof. Dr.-Ing. Matthias Hollick
matthias.hollick@seemoo.tu-darmstadt.de

Prof. Dr.-Ing. Matthias Hollick

Technische Universität Darmstadt
Secure Mobile Networking Lab - SEEMOO
Department of Computer Science
Center for Advanced Security Research Darmstadt - CASED

Mornewegstr. 32
D-64293 Darmstadt, Germany
Tel.+49 6151 16-70922, Fax. +49 6151 16-70921
http://seemoo.de or http://www.seemoo.tu-darmstadt.de

Overview of this Module

(1) What do YOU think is “Network Security”
(2) Contents and schedule of lectures and exercises
(3) Literature
(4) References, acknowledgements and contact

Chapter 00, Module 02

What do YOU think about …

SECURE MOBILE NETWORKING

Network Security

What do YOU think about …

… Network Security

What do YOU think about …

… Internet Security in practice?

… Who was the most dangerous person in the Internet in early 2013?

Network Security

[Source: stumbled upon on some tumblr.com blog]

Network Security

[Source: stumbled upon on some tumblr.com blog]

Network Security …

Is tremendously complex … it has to be regarded from various angles … throughout the lecture, there are going to be "additional readings" that point to various interesting sources of information (be it blogs, excerpts from books, essays, etc.)

Today's additional reading is available on Moodle or can be obtained directly via the Internet:

Steven M. Bellovin. Security as a systems property. *IEEE Security & Privacy*, 7(5), September-October 2009.

- http://www.cs.columbia.edu/~smb/papers/cleartext-2009-09.pdf
- The blog of Steven Bellovin provides also for an interesting read and goes far beyond technical aspects: http://www.cs.columbia.edu/~smb/blog/control/

Contents & Schedule

Contents of the Lecture

SEEMOO
SECURE MOBILE NETWORKING

(00) Organization and introduction

(01) Fundamentals: reference model for network security, security threats, attacks, services, and mechanisms

(02) Cryptography applied to networks: pitfalls

(03) Application layer security

(04) Transport layer security

(05) Network layer security

(06) Link layer security

(07) Physical layer security

(08) Selected topics: security for wireless and mobile networks, security in peer-to-peer systems, security in voice-over-IP

(09) Operational security: firewalls, intrusion detection systems

NetSec Schedule Summer 2015
v1, 15.04.2015

SECURE MOBILE NETWORKING

Date format: yyyymmdd

20150415 - Organisation and Intro
20150416 - Ex.1 (read@home)

20150422 - Fundamentals I, FREAK Bonus
20150423 - Fundamentals II, Ex.1 (read@home)

20150429 - Crypto Pitfalls
20150430 - Ex.1 (read@class), EX.2 (crypto@home)

20150506 - Application Level Security I
20150507 - Application Level Security II

20150513 - Transport L. Sec. I, Ex.3 (@home)
20150514 - Public Holiday - Enjoy

20150520 - Transport Level Security II
20150521 - Network Level Security I

20150527 - Network Level Security II
20150528 - Ex.3 (transport@class), Ex.4 (IDS, @class and @home)

20150603 - VLAN Security
20150604 - Public Holiday – Enjoy

20150610 - Meet & Move & Pasta – Enjoy
20150611 - Link Level Security I

20150617 - Link Level Security II
20150618 - Ex.4 (wlan security demo, @class)

20150624 - No Lecture
20150625 - Physical Level Security

20150701 - Guest Lecture
20150702 - Operational Security/Firewalls

20150708 - Concluding the Lecture
20150709 - No Lecture

20150715 - Consultation hour
20150716 - No lecture

20150724 - EXAM 13:00-16:00

Ex.5 (cisco security, @hrz)

Bonus

Bonus?!

We decided to honor students that are active and contribute to the lecture (sort of motivating you to self-motivate)

Exercise mode: regular exercises + bonus tasks

Bonus system:

- The exercises are coupled to a bonus system
  - Throughout the entire course 275 credits can be obtained
  - If you score at least 230 credits, you get a 0.7 grade bonus
  - If you score at least 190 credits, you get a 0.3 grade bonus

- There will be a bonus bonus challenge
  - We want you to demonstrate the FREAK attack to us in a practical setting

Exercise Topics

SECURE MOBILE NETWORKING

Exercise 1 (30 Points)
- Reading exercise
- Creating and answering questions

Exercise 2 (10 Points)
- Crypto

Exercise 3 (60 Points)
- SSL/TLS

Hands-on

Exercise 4 (85 Points)
- Intrusion Detection Systems
- Reconnaisance

Hands-on

Exercise 5 (80 Points)
- Network Layer Security

Hands-on

FREAK Bonus (10 Points)
- Successful attack
  + documentation
  + short presentation

Hands-on

Deadlines

Deadlines are hard for all exercise submissions.

Late submissions are subject to the following penalty:

- Up to 1 day late: you will achieve up to 50% of the points
- Up to 2 days late: you will achieve up to 25% of the points
- More than 2 days late: zero points

Source: www.mpug.com

Recommended Textbooks

[KaPeSp2002] Charlie Kaufman, Radia Perlman, Mike Speciner: Network Security – Private Communication in a Public World, 2nd Edition, Prentice Hall, 2002, ISBN: 978-0-14-046019-6

[Stallings2011] William Stallings, Network Security Essentials, 4th Edition, Prentice Hall, 2011, ISBN: 978-0-146-10805-4

[Stallings2011b] William Stallings, Lawrence Brown, Computer Security: Principles and Practices, Pearson Education, 2011, ISBN: 978-0-273-76449-6

[BuHu2008] Levente Buttyan, Jean-Pierre Hubaux: Security and Cooperation in Wireless Networks, Cambridge University Press, 2008, ISBN: 978-0-521-87371-0 (book is available online for download)

[Bishop2003] Matt Bishop: Computer Security – Art and Science, Addison Wesley, 2003, ISBN: 978-0-201-44099-7

[Anderson2008] Ross Anderson: Security Engineering, 2nd Edition, Wiley, 2008, ISBN: 978-0-470-06852-6

[KuRo2010] James F. Kurose, Keith W. Ross: Computer Networking: A Top-Down Approach, 5th Edition, Addison Wesley, 2010, ISBN: 9780136079675

The Most Dangerous Person in the Internet (Early 2013)

Source: https://twitter.com/#!/dborch/status/162606933847719936

Contact

Prof. Dr.-Ing. Matthias Hollick
Department of Computer Science

SEEMOO
Mornewegstr. 32
64293 Darmstadt/Germany
matthias.hollick@seemoo.tu-darmstadt.de

Phone +49 6151 16-70920
Fax +49 6151 16-70921
www.seemoo.tu-darmstadt.de

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