

**Information and
Communications Security**
WS 14/15
Assignment 2
Access Control

Fachbereich
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Institut für Wirtschaftsinformatik
Lehrstuhl für M-Business & Multilateral Security
www.m-chair.net

Prof. Dr. Kai Rannenberg
M.Sc. Christopher Schmitz
M.Sc. Fatbardh Veseli
M.Sc. Ahmed S. Yesuf

E-Mail sec@m-chair.net

Study the following questions and prepare your answers before **5th of November 2014**.

Exercise 1:

Alice can read FileX, can append to FileY, and can write to FileZ. Bob can append to FileX, can write to FileY, and cannot access FileZ. Write the access control matrix M that specifies the described set of access rights for subjects Alice and Bob to objects FileX, FileY and FileZ.

Exercise 2:

- What are the basic differences between access control lists (ACL) and capability lists (CList)? Compare these approaches in terms of revocation of a user's access to a particular set of files.
- Write a set of access control lists for the situation given in exercise 1. With what is each list associated?
- Write a set of capability lists for the situation given in exercise 1. With what is each list associated?

Exercise 3:

Given the access rights defined in exercise 1, the subject's security levels are $L_{\text{Alice}} = \text{Confidential}$ and $L_{\text{Bob}} = \text{Secret}$, and the object's security levels are $L_{\text{FileX}} = \text{Unclassified}$, $L_{\text{FileY}} = \text{Secret}$, $L_{\text{FileZ}} = \text{Top Secret}$ ($\text{Top Secret} > \text{Secret} > \text{Confidential} > \text{Unclassified}$).

- Draw a Bell-LaPadula model which visualizes the access rights defined in access control matrix M.
- Which of the following actions are allowed? Explain and justify your answer.
 - Alice reads FileX
 - Alice reads FileY
 - Bob appends to FileX
 - Bob appends to FileZ

Exercise 4:

Create a role based access control model for a local society. Bring the following roles in a meaningful hierarchy: Guests, active and inactive members, cashier, cash auditor, and society's chairman.

Note that cashier and cash auditor are always active members, and that the society's chairman and the cash auditor are officers of the society.