

# IS2150/TEL2810 Introduction to Security

## Homework 4

Total Points: 100

Due Date: Oct 20, 2009

- 1) From Section 6.6 Do exercise 1, 3 **(Points 20)**
- 2) What are the contributions of the Clark-Wilson Model **(Points 10)**
- 3) Assume that Alice and Bob are friends. Consider two conflict of class sets  $COI_1 = \{X, Y\}$  and  $COI_2 = \{U, V\}$ . Let  $CD_X$ ,  $CD_Y$ ,  $CD_U$ , and  $CD_V$  be the company data sets of companies X, Y, U and V. **(Points 20)**

Show all the possible assignments that are allowed and prohibited by the Chinese wall policy - consider read only assignments as well as read and write.

Consider the following scenarios;

1. Only read accesses need to be provided to CDs
2. Both read and write accesses need to be provided together to any CD.
3. Both read/write required for  $CD_X$ , and  $CD_V$ , and read-only to remaining CDs.

Note that Alice and Bob may not be able to cover all the CDs – for that you can assume there are others who can take on the assignment. You need to only consider Alice and Bob.

- 4) Let the following be the role hierarchy relationships, **(Points 10 + 20)**

$$RH = \{(r_1, r_2), (r_1, r_3), (r_2, r_4), (r_2, r_5), (r_3, r_5), (r_3, r_8), (r_6, r_3), (r_6, r_7), (r_7, r_8)\}.$$

Note that  $(r_i, r_j)$  means  $r_i$  is senior of  $r_j$ . Let each role be *assigned* to exactly one unique user. We can assume that  $u_i$  is *assigned* to role  $r_i$ . Further, note that if  $u$  is assigned to  $r$  that means  $u$  is authorized for  $r$ . Based on these, answer the following.

- a Find *authorized\_users*( $r_5$ ) and *authorized\_users*( $r_4$ )?
  - b For each of following SSD constraints, state if the above hierarchy and the user assignments would result in a conflict (*Consider each of these individually only*)
    - $(\{r_2, r_7\}, 7)$
    - $(\{r_5, r_7\}, 7)$
    - $(\{r_2, r_3, r_4, r_7\}, 3)$
- 5) Assume that  $(RS, n)$  is included in both *SSD* and *DSD*. Explain the implication of allowing these to exist together in a policy (Your answer should focus on: (i) does it make sense to have them together?; (ii) will they generate a conflicting situation? (iii) if having them is a good idea – why; or if having them is a bad idea which one would you remove?) **(Points 20)**