

IS-2150/TEL-2810 Introduction to Security

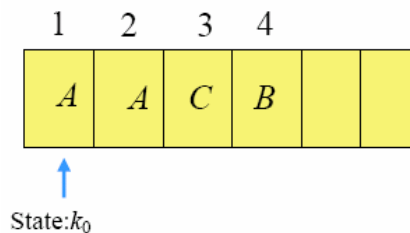
Homework 2

Due Date: By Midnight of September 27, 2006

(Total points: 100)

- Let x and y be subjects, z a subject or object, and r be right. Write the following two access control commands that capture the *take_right* and *grant_right* commands as specified below:
 - command *take_right*(x, y, z, r): x takes right r over z from y , provided x has *take* right over y , and y has r right over z .
 - command *grant_right*(x, y, z, r): x grants right r over z to y (provided x has *grant* right over y , and x has r right over z).
- Do problems 1 and 2 from exercise 2.6 (page 35)
- Do problem 1 from exercise 3.5 (page 44).
- Consider a Turing Machine with the following specification
 - Set of states: $\{k_0, k_1, k_2, k_3\}$
 - Tape symbols: $\{A, B, C\}$
 - Final (or halting) state is k_3
 - Transition Functions: $\delta(k_0, A) = (k_2, C, R)$; $\delta(k_1, C) = (k_2, B, R)$; $\delta(k_1, A) = (k_3, C, L)$;
 $\delta(k_2, A) = (k_1, C, L)$; $\delta(k_2, C) = (k_1, B, R)$

Assume your TM's initial configuration is as shown below. Show the mapping of the elements of this TM to a protection system. Show all possible transitions, indicating each new TM configuration reached (i.e., state, head position and the symbols in each cell) and its corresponding protection state (the entries in the Access Control Matrix).



- Read the following papers (click the paperlist link)
 - Ravi S. Sandhu, Pierangela Samarati, "Access Control: Principles and Practice", IEEE Communications Magazine, September 1994.
 - James B. D. Joshi, Walid G. Aref, Arif Ghafoor and Eugene H. Spafford, "Security models for web-based applications", *Communications of the ACM*, 44, 2 (Feb. 2001), Page 38-44.

Write a critique/review/summary of one of the two papers (upto 2 pages) – you are welcome to write on both.