CIS 4360 Introduction to Computer Security

Home Assignment 1, Fall 2011 — SOLUTIONS

Due date: Sept 13, 2011

This concerns the basic requirements for Computer Security.
Examples taken from Matt Bishop’s Introduction to Computer Security, Addison-Wesley.

1. Classify each of the following as a violation of Confidentiality (C), Integrity (I), Availability (A), or of some combination of these.

   (a) John copies Mary’s homework. (C)
   (b) Paul crashes Linda’s system. (A)
   (c) Carol changes the amount of Angelo’s check from $100 to $1,000. (I)
   (d) Gina forges Rogers signature on a deed. (I)
   (e) Rhonda registers the domain name “AddisonWesley.com” and refuses to let the publishing house buy or use that domain name. (A)
   (f) Jonah obtains Peter’s credit card number and has the credit card company cancel the card and replace it with another card bearing a different account number. (A), (I)
   (g) Henry spoofs Julie’s IP address to gain access to her computer. (C), (I)

2. Identify: (a) the policies, and (b) the mechanisms that support the following.

   (a) A password-changing program will reject passwords that are less than five characters long or that are found in the dictionary.
       Answer. The policy is that easily guessed passwords are forbidden. The mechanism is a program that checks for, and rejects passwords less than five characters.

   (b) Only students in a Computer Science class will be given accounts on the departments computer system.
       Answer. The policy is that only students in that class may use the CS Department’s system. The mechanism is the procedure of not giving other students an account.

   (c) The login program will disallow logins of any students who enter their passwords incorrectly three times.
       Answer. The policy is that only authorized students may login (so guessing is not allowed). The mechanism is that after three failed attempts the system disables the account.

   (d) The permissions of the file containing Carol’s homework will prevent Robert from cheating and copying it.
       Answer. The policy is that no student may read another student’s homework. The mechanism is the file protection mechanism that restricts read access.
(e) When World Wide Web traffic climbs to more than 80% of the network’s capacity, systems will disallow any further communications to or from Web servers.

Answer. The policy is that World Wide Web traffic may not interfere with other network traffic (such interference being defined as using more than 80% of the network’s capacity). The mechanism is to block any traffic to or from the World Wide Web servers when the traffic is more than 80% of the network’s capacity.

(f) Annie, a systems analyst, will be able to detect a student using a program to scan her system for vulnerabilities.

Answer. The policy is that systems may not be scanned for vulnerabilities by students. The mechanism is whatever Annie used to detect the scanning.

(g) A program used to submit homework will turn itself off just after the due date.

Answer. The policy is that late homework is not accepted. The mechanism is the program disabling itself after the due date.

3. Give an example of a situation in which a compromise of confidentiality leads to a compromise in integrity.

Answer. An example of a situation in which a compromise of confidentiality will lead to a compromise in integrity, is the compromise of a cryptographic key protecting the integrity of the system.

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