

IS-2150/TEL-2810 Introduction to Security

Homework 1
Sample Solution
Total: 50 Points

1. [20 Points] Do the following from Chapter 1

From section 1.11, do exercises 1, 4, 9, 15

Exercise 1: Classify each of the following as a violation of confidentiality, of integrity, of availability, or of some combination thereof.

- a. John copies Mary's homework. [**confidentiality**]
- b. Paul crashes Linda's system. [**availability, integrity**]
- c. Carol changes the amount of Angelo's check from \$100 to \$1,000. [**data integrity**]
- d. Gina forges Roger's signature on a deed. [**integrity**]
- e. Rhonda registers the domain name "AddisonWesley.com" and refuses to let the publishing house buy or use that domain name. [**availability**]
- 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. [**confidentiality, integrity, availability**]
- g. Henry spoofs Julie's IP address to gain access to her computer. [**source integrity**]

Exercise 4:

If you can get the username and password of someone's email account (confidentiality), that would result in integrity violation - you will be able to send messages to exchange data as if you are him. Another example is the leakage of password of root – someone can now login as root and change anything in the system – violating integrity.

Exercise 9: Policy restricts the use of electronic mail on a particular system to faculty and staff. Students cannot send or receive electronic mail on that host. Classify the following mechanisms as secure, precise, or broad.

- a. The electronic mail sending and receiving programs are disabled.
[secure]
- b. As each letter is sent or received, the system looks up the sender (or recipient) in a database. If that party is listed as faculty or staff, the mail is processed. Otherwise, it is rejected. (Assume that the database entries are correct.)
[precise]
- c. The electronic mail sending programs ask the user if he or she is a student. If so, the mail is refused. The electronic mail receiving programs are disabled.
[broad]

Exercise 15: An organization makes each lead system administrator responsible for the security of the system he or she runs. However, the management determines what programs are to be on the system and how they are to be configured.

a. Describe the security problem(s) that this division of power would create.

Security mechanism in a company depends on who is responsible for the company's security. The power to implement appropriate controls must reside with those who are responsible. If management determines what programs are to be on the system, then the system administrators who are responsible for the security, who see the need for security measures will be unable to implement the appropriate security measures. Since management is not aware of the technical aspects of security as much as system administrators it's possible for management to make some poor choices with regard to cost, resources, security measures. Also coordination among the system coordinators is also pivotal in an organization and this coordination might be compromised if management makes the key security decisions.

b. How would you fix them?

The problem can be fixed by providing system administrators (knowledgeable people) with more control and sufficient resources for administering computer systems. Management should consult the system administrators before making any decision on security issues. If the company has several divisions each should have separate system administrator then the company can have one security head who is knowledgeable about security issues and who heads all the systems administrators. Management should leave all the key security decisions to him. Security head should take care of delegating the appropriate security tasks to the concerned system administrators. Part of the management role requires them to know about the cost, resources, security policies etc, and management can get up to date about these by consulting the security head.