

Table 18.1 Examples of threats.

Threat	Theft and fraud	Loss of confidentiality	Loss of privacy	Loss of integrity	Loss of availability
Using another person's means of access	✓	✓	✓		
Unauthorized amendment or copying of data	✓			✓	
Program alteration	✓			✓	✓
Inadequate policies and procedures that allow a mix of confidential and normal output	✓	✓	✓		
Wire tapping	✓	✓	✓		
Illegal entry by hacker	✓	✓	✓		
Blackmail	✓	✓	✓		
Creating 'trapdoor' into system	✓	✓	✓		
Theft of data, programs, and equipment	✓	✓	✓		✓
Failure of security mechanisms, giving greater access than normal		✓	✓	✓	
Staff shortages or strikes				✓	✓
Inadequate staff training		✓	✓	✓	✓
Viewing and disclosing unauthorized data	✓	✓	✓		
Electronic interference and radiation				✓	✓
Data corruption owing to power loss or surge				✓	✓
Fire (electrical fault, lightning strike, arson), flood, bomb				✓	✓
Physical damage to equipment				✓	✓
Breaking cables or disconnection of cables				✓	✓
Introduction of viruses				✓	✓

The extent that an organization suffers as a result of a threat's succeeding depends upon a number of factors, such as the existence of countermeasures and contingency plans. For example, if a hardware failure occurs corrupting secondary storage, all processing activity must cease until the problem is resolved. The recovery will depend upon a number of factors, which include when the last backups were taken and the time needed to restore the system.

An organization needs to identify the types of threat it may be subjected to and initiate appropriate plans and countermeasures, bearing in mind the costs of implementing them. Obviously, it may not be cost-effective to spend considerable time, effort, and money on potential threats that may result only in minor inconvenience. The organization's business may also influence the types of threat that should be considered, some of which may be rare. However, rare events should be taken into account, particularly if their impact would be significant. A summary of the potential threats to computer systems is represented in Figure 18.1.

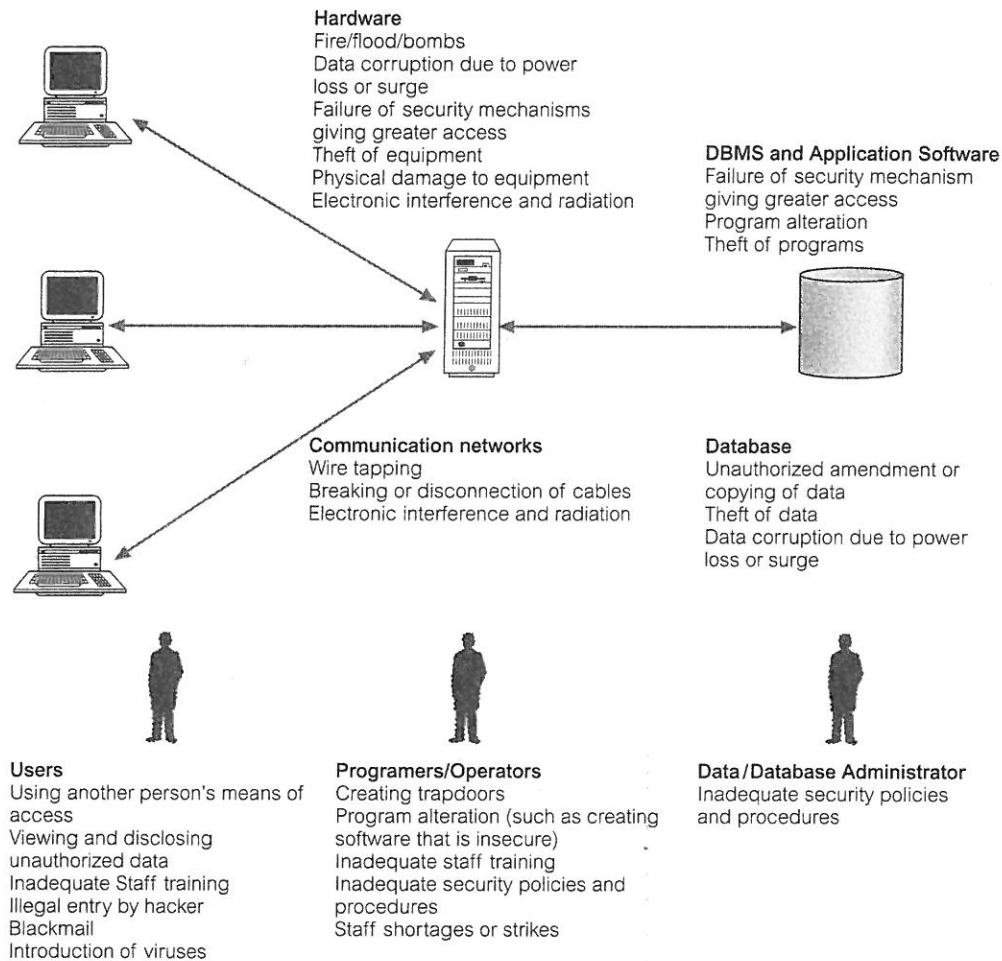


Figure 18.1 Summary of potential threats to computer systems.

Countermeasures – Computer-Based Controls

18.2

The types of countermeasure to threats on computer systems range from physical controls to administrative procedures. Despite the range of computer-based controls that are available, it is worth noting that, generally, the security of a DBMS is only as good as that of the operating system, owing to their close association. Representation of a typical multi-user computer environment is shown in Figure 18.2. In this section we focus on the following computer-based security controls for a multi-user environment (some of which may not be available in the PC environment):