Chapter 4

Access Control

Access Control Definitions 1/2

NISTIR 7298 defines access control as:

> “the process of granting or denying specific requests to: (1) obtain and use information and related information processing services; and (2) enter specific physical facilities”

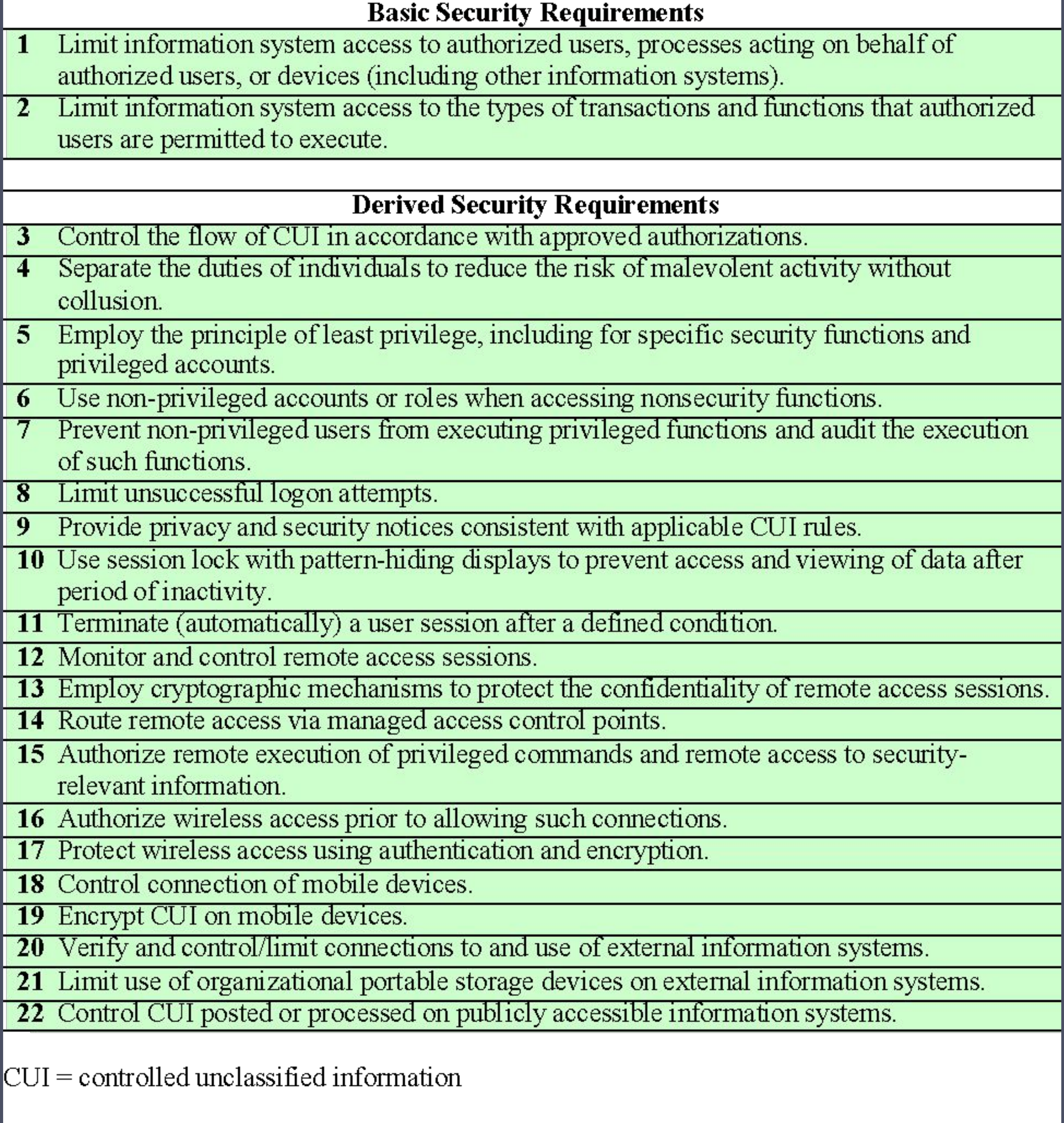
Access Control Definitions 2/2

RFC 4949 defines access control as:

> “a process by which use of system resources is regulated according to a security policy and is permitted only by authorized entities (users, programs, processes, or other systems) according to that policy”

Table 4.1

Access Control Security Requirements (SP 800-171)



	Basic Security Requirements
1	Limit information system access to authorized users, processes acting on behalf of authorized users, or devices (including other information systems).
2	Limit information system access to the types of transactions and functions that authorized users are permitted to execute.
	Derived Security Requirements
3	Control the flow of CUI in accordance with approved authorizations.
4	Separate the duties of individuals to reduce the risk of malevolent activity without collusion.
5	Employ the principle of least privilege, including for specific security functions and privileged accounts.
6	Use non-privileged accounts or roles when accessing nonsecurity functions.
7	Prevent non-privileged users from executing privileged functions and audit the execution of such functions.
8	Limit unsuccessful logon attempts.
9	Provide privacy and security notices consistent with applicable CUI rules.
10	Use session lock with pattern-hiding displays to prevent access and viewing of data after period of inactivity.
11	Terminate (automatically) a user session after a defined condition.
12	Monitor and control remote access sessions.
13	Employ cryptographic mechanisms to protect the confidentiality of remote access sessions.
14	Route remote access via managed access control points.
15	Authorize remote execution of privileged commands and remote access to security-relevant information.
16	Authorize wireless access prior to allowing such connections.
17	Protect wireless access using authentication and encryption.
18	Control connection of mobile devices.
19	Encrypt CUI on mobile devices.
20	Verify and control/limit connections to and use of external information systems.
21	Limit use of organizational portable storage devices on external information systems.
22	Control CUI posted or processed on publicly accessible information systems.

CUI = controlled unclassified information

(Table is on page 107 in the textbook)

Access Control Principles

- In a broad sense, all of computer security is concerned with access control

- RFC 4949 defines computer security as:

> "measures that implement and assure security services in a computer system, particularly those that assure access control service"

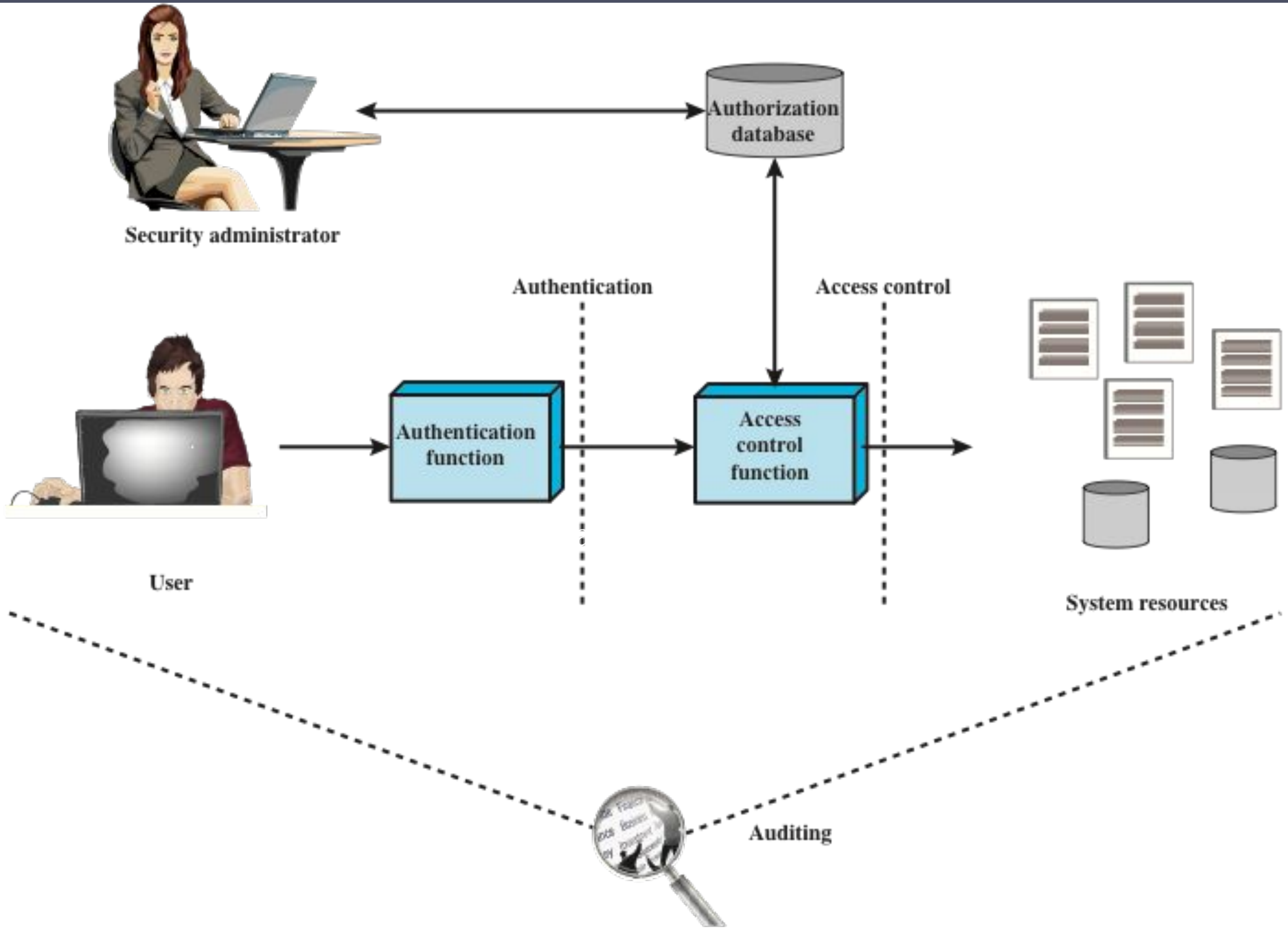


Figure 4.1 Relationship Among Access Control and Other Security Functions

Source: Based on [SAND94].

Access Control Policies

- Discretionary access control (DAC)
  - Controls access based on the identity of the requestor and on access rules (authorizations) stating what requestors are (or are not) allowed to do
- Mandatory access control (MAC)
  - Controls access based on comparing security labels with security clearances
- Role-based access control (RBAC)
  - Controls access based on the roles that users have within the system and on rules stating what accesses are allowed to users in given roles
- Attribute-based access control (ABAC)
  - Controls access based on attributes of the user, the resource to be accessed, and current environmental conditions