# Identification & Authentication

## in

# Local & Distributed

# Systems

## CSI-604 - Information Security

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# Course Outline

**Course Name: Information Security**
**Credit Hours:** 3(3-0)
**Prerequisites: Data Communication and Computer Networks**
**Course Outline:**

Basic notions of confidentiality, integrity, availability; authentication models; protection models; security kernels; Encryption, Hashing and Digital Signatures; audit; intrusion detection and response; database security, hostbased and network-based security issues operational security issues; physical security issues; personnel security; policy formation and enforcement; access controls; information flow; legal and social issues; identification and authentication in local and distributed systems; classification and trust modeling; risk assessment

**Reference Materials:**
1. *Computer Security: Art and Science*, Matthew Bishop
2. *Cryptography and Network Security* by William Stalling 6th Edition, 2012
3. *Principles of Information Security* 3rd E by Michael E. Whitman and Herbert J. Mattord

# Identification and Authentication of Local and Distributed Systems

- "Identification and authentication" are two distinct but closely related concepts in the context of both *local* (single-system) and *distributed* (networked) systems.

- They play a crucial role in ensuring the security and access control of users and entities within these systems.

- Major differences are discussed:

# Identification and Authentication of Local and Distributed Systems cont...

- **<u>Identification:</u>** Identification is the process by which a user or entity claims an *identity*, such as a **username** or **account number**, within a **system**.

- Identification alone does not **<u>verify</u>** the *authenticity* of the user's claim; it merely establishes the claimed identity within the system.

# Identification and Authentication of Local and Distributed Systems cont...

- **Local Systems:** In a local system (e.g., a single-user computer or a stand-alone application), identification might involve the **_user entering_** a **_username_** or **_selecting a profile_**.

- The system then associates the chosen identifier with the corresponding user account or profile.

# Identification and Authentication of Local and Distributed Systems cont...

- **<u>Distributed Systems:</u>** In a distributed system (e.g., a networked application or a multi-user server), identification usually occurs when a user provides a username or other identifying information during the login process.

- The distributed system then associates this identifier with the user's account or role within the network.

# Identification and Authentication of Local and Distributed Systems cont...

- **Authentication:** Authentication, on the other hand, is the process of *verifying* whether the **claimed identity** is **valid** and belongs to the entity making the claim.

- Authentication ensures that the user is who they say they are and that they have the necessary credentials to access the system or resources within it.

# Identification and Authentication of Local and Distributed Systems cont...

- **Local Systems:** In local systems, authentication may involve entering a *password*, *PIN*, *fingerprint*, or other credentials to prove that the person interacting with the system is the authorized user of that account or device.

- The system checks the provided credentials against stored records to grant or deny access.

# Identification and Authentication of Local and Distributed Systems cont…

- **<u>Distributed Systems:</u>** In distributed systems, authentication often includes providing a password, passphrase, or other authentication factor.

- Additionally, more advanced authentication methods like multi-factor authentication (MFA) might be used in distributed systems to enhance security.

# Identification and Authentication of Local and Distributed Systems cont...

- Authentication mechanisms in distributed systems involve communication between the user's device and a remote authentication server to verify credentials.