# Information Flow


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

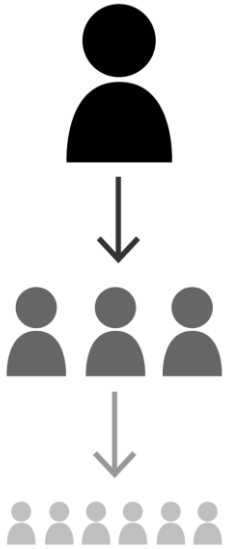
# Information Flow

- Information flow is the ***exchange of information*** among **people**, **processes** and **systems** ***within an organization***.
- When you have employees working across different ***locations***, ***devices*** and ***departments***, it can be difficult to keep everyone on the same page.
- It's very important to know information flow, for information security.

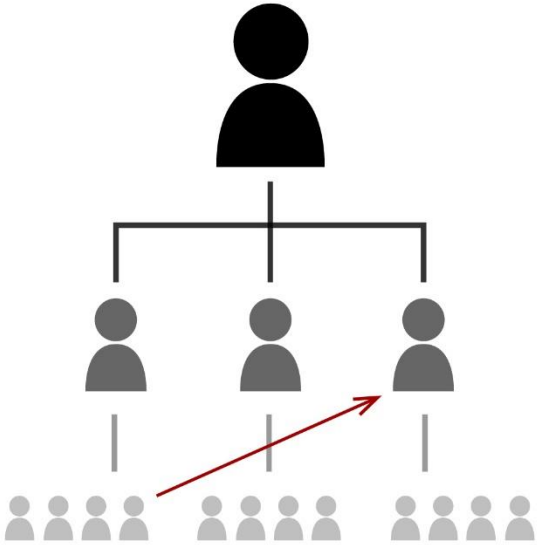
# Information Flow cont…

- The main types of information flow include:

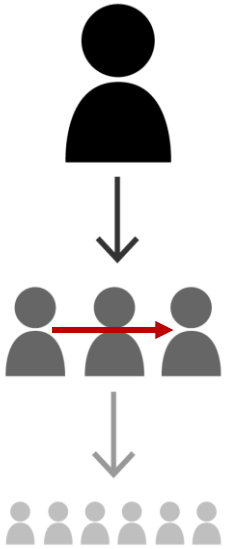
**Downward**



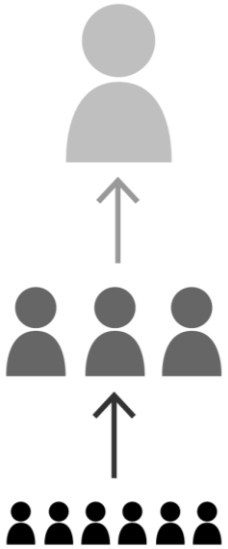
**Diagonal**



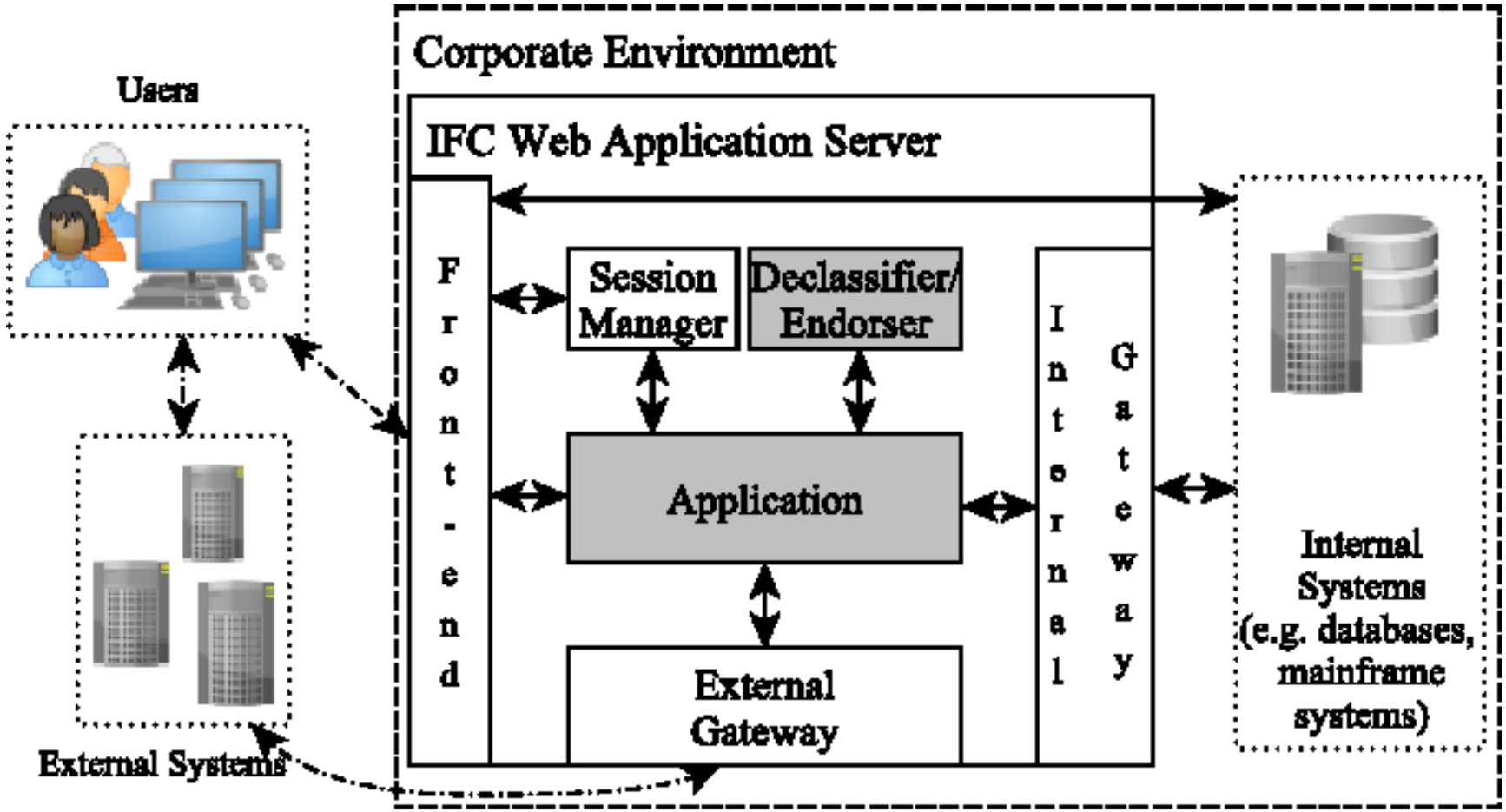
**Horizontal**



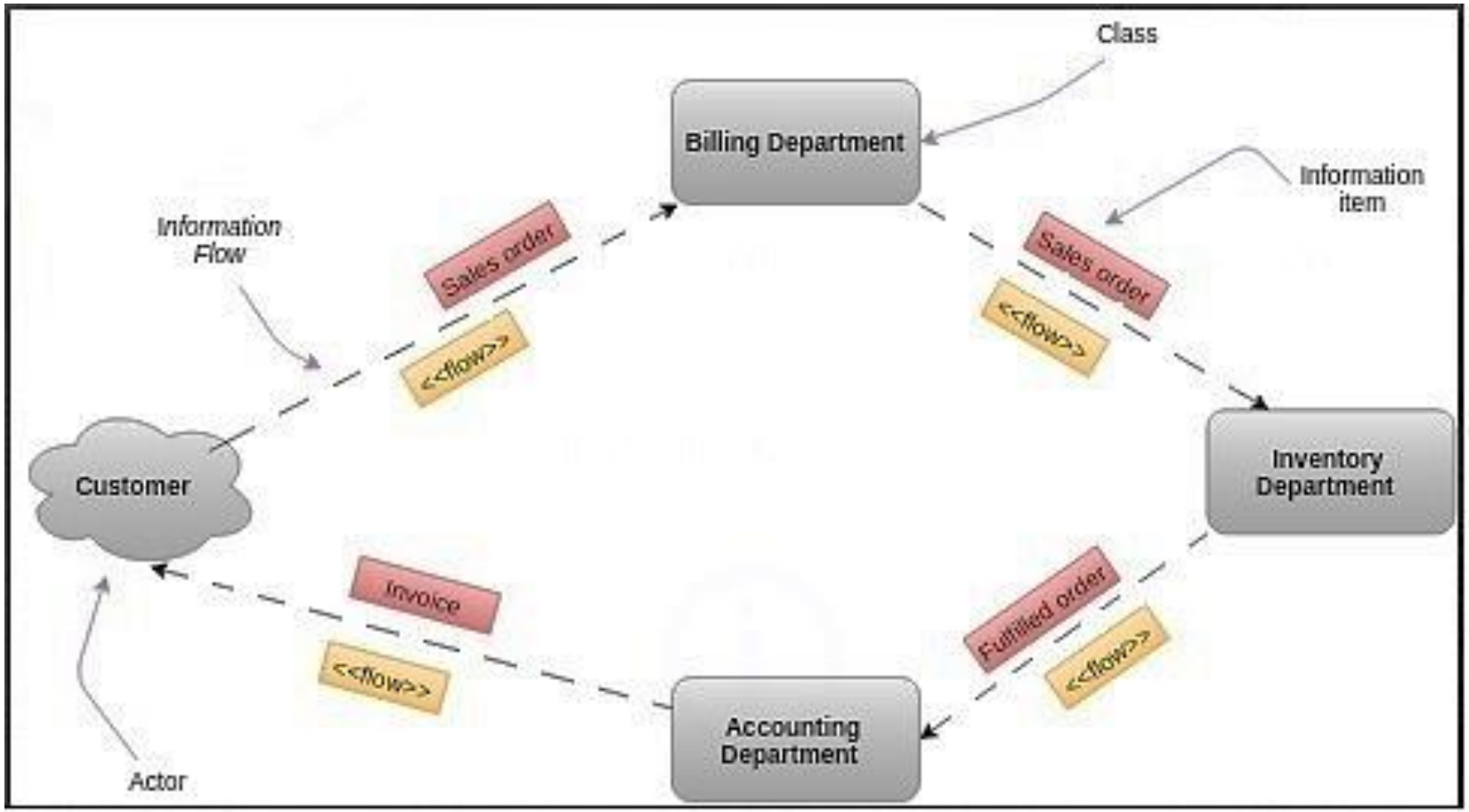
**Upward**



# Information Flow cont…
# Web systems



# Information Flow cont…
# Information Flow Diagram



# Information Flow cont…
# Controlling Information flow

- Information Flow Control (IFC) is a ***mechanism*** in which a **system** may ***track data movement*** from one location to another.
- It's a security technique that keeps track of information flow between a ***system*** and the ***rest of the world*** (Internet).

# Information Flow cont…
# Controlling Information flow

- Users want their credentials to remain ***private***.
- ***Access control*** has traditionally been the **primary technique** for stopping information from being spread.
- Access control, on the other hand, is ***insufficient*** in many instances since it demands an all-or-nothing.
- Some additional IFC mechanisms are given here:

# Information Flow cont…
# Controlling Information flow

- **Data Classification:** Information is classified into different ***categories*** or ***levels*** based on its **sensitivity**. Common classifications include ***public***, ***internal***, ***confidential***, and ***highly confidential***.
- **Data Flow Policies:** Systems implement policies that define how data can flow from one location or process to another. These policies are typically based on the ***labels*** assigned to the data.

# Information Flow cont…
# Controlling Information flow

- **Information Tracking:** Information flow control mechanisms ***track the movement*** of data ***throughout the system***. This tracking helps ensure that data is handled appropriately.
- **Data Sanitization:** When data is declassified or downgraded, it may need to be ***sanitized*** to ***remove sensitive information***. This process ensures that lower-level users do not gain access to classified data.

# Information Flow cont…
# Controlling Information flow

- **Audit and Compliance:** Information flow control mechanisms often include auditing capabilities to track and log data movements for compliance and forensic purposes.