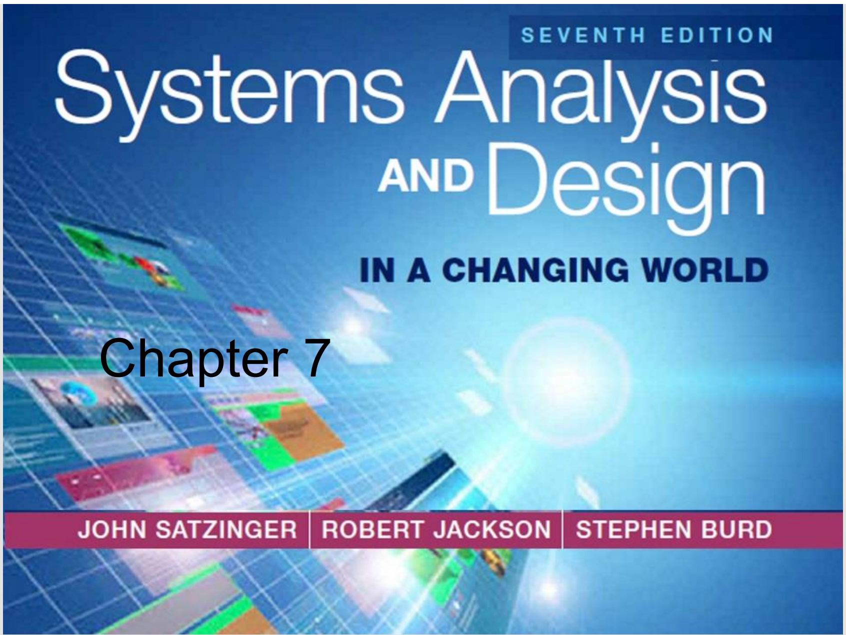


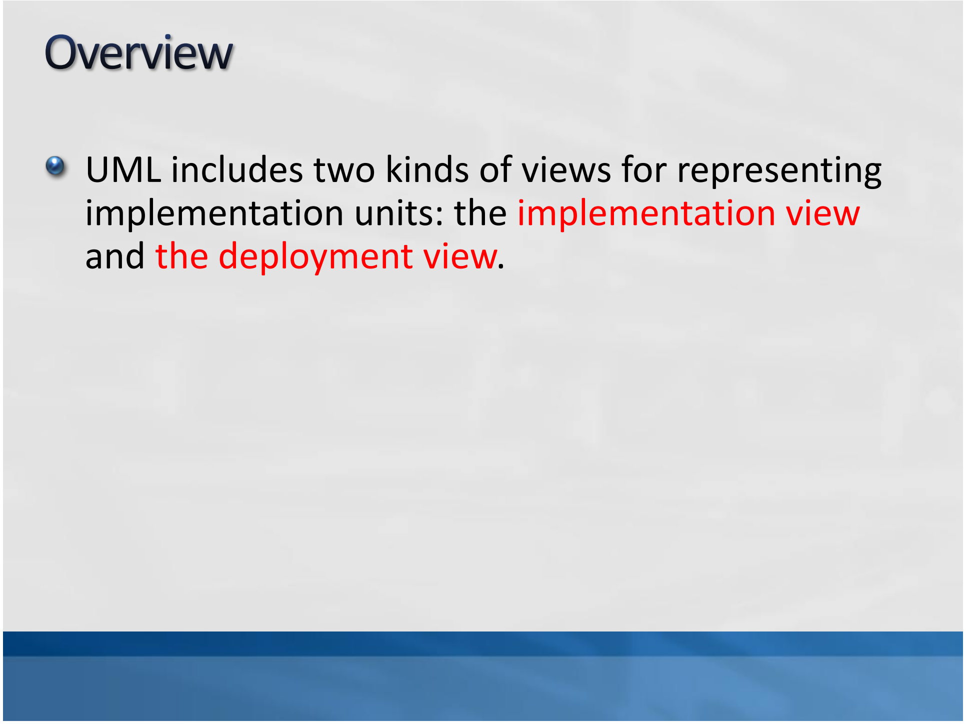
Chapter 7

Component and Deployment Diagram

Chapter 7

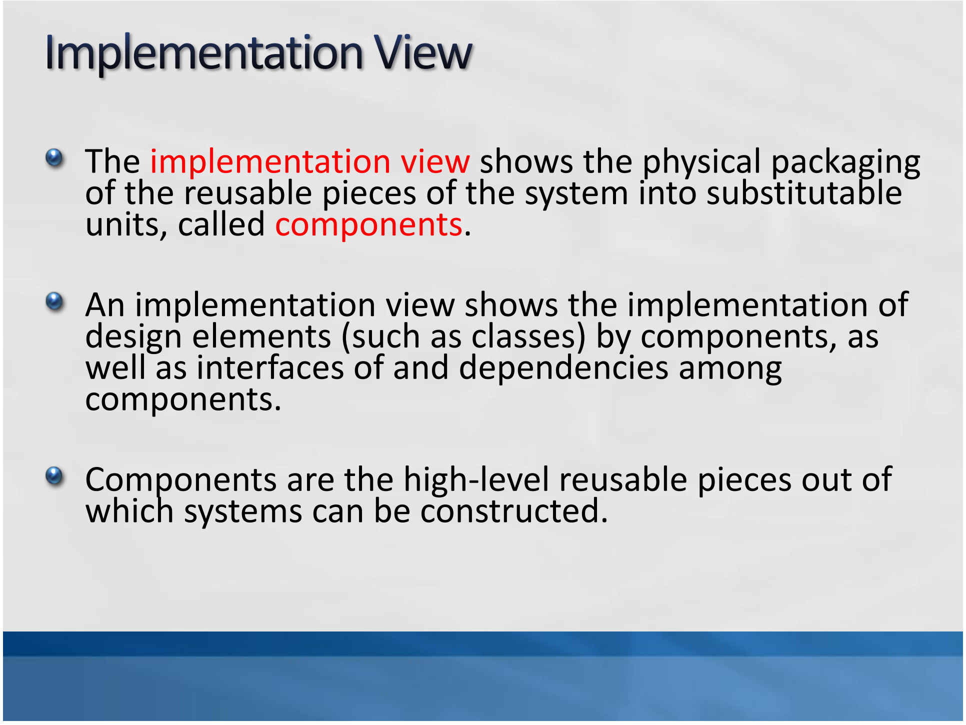
Systems Analysis and Design
in a Changing World 7th Ed

Satzinger, Jackson & Burd



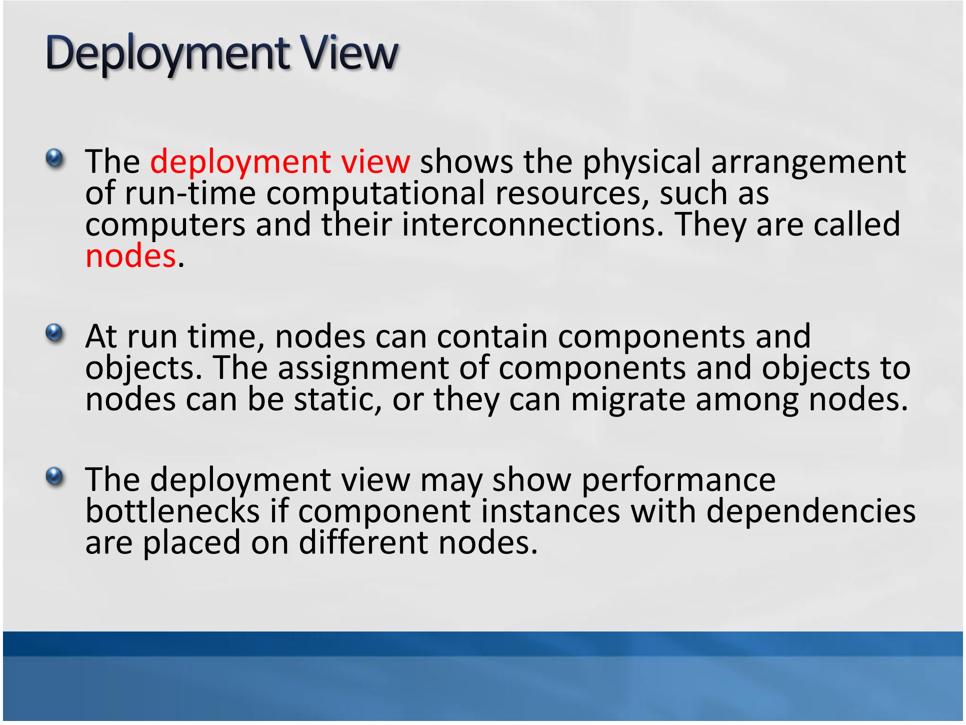
Overview

- UML includes two kinds of views for representing implementation units: the implementation view and the deployment view.



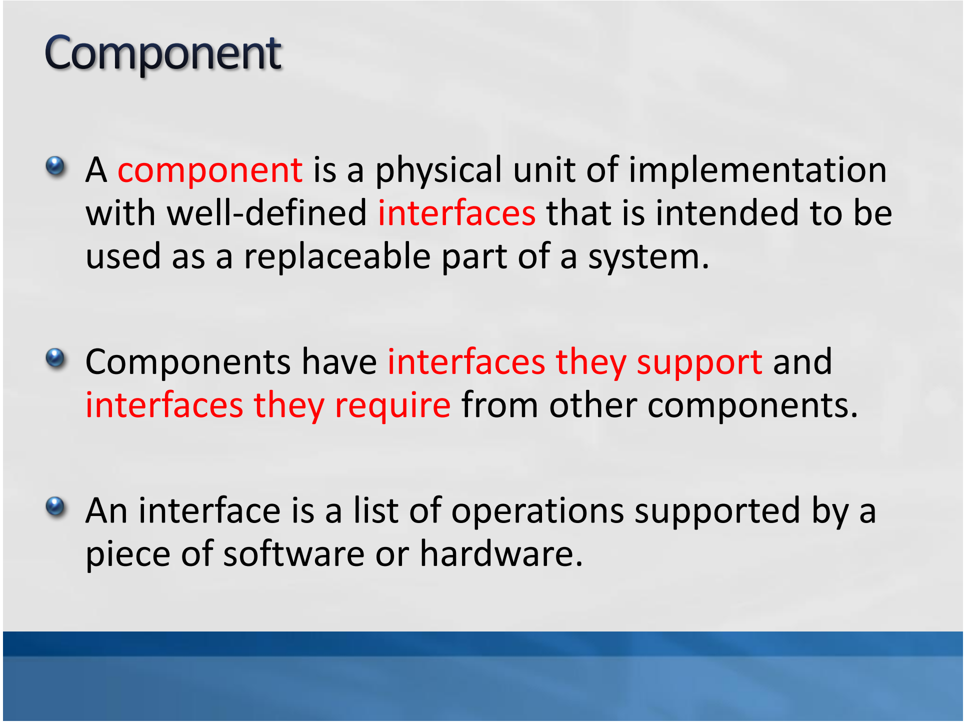
Implementation View

- The implementation view shows the physical packaging of the reusable pieces of the system into substitutable units, called components.
- An implementation view shows the implementation of design elements (such as classes) by components, as well as interfaces of and dependencies among components.
- Components are the high-level reusable pieces out of which systems can be constructed.



Deployment View

- The deployment view shows the physical arrangement of run-time computational resources, such as computers and their interconnections. They are called nodes.
- At run time, nodes can contain components and objects. The assignment of components and objects to nodes can be static, or they can migrate among nodes.
- The deployment view may show performance bottlenecks if component instances with dependencies are placed on different nodes.



Component

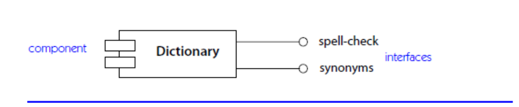
- A component is a physical unit of implementation with well-defined interfaces that is intended to be used as a replaceable part of a system.
- Components have interfaces they support and interfaces they require from other components.
- An interface is a list of operations supported by a piece of software or hardware.

UML Component Diagram

- Used to model the top-level view of the system design in terms of components and dependencies among the components. Components can be
  - source code, linkable libraries, executables
- The dependencies (edges in the graph) are shown as dashed lines with arrows from the client component to the supplier component:
  - The lines are often also called connectors
  - The types of dependencies are implementation language specific
- Informally also called “software wiring diagram“ because it show how the software components are wired together in the overall application.

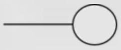
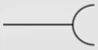
Component

- A component is drawn as a rectangle with two small rectangles on its side. It may be attached by solid lines to circles that represent its interfaces.



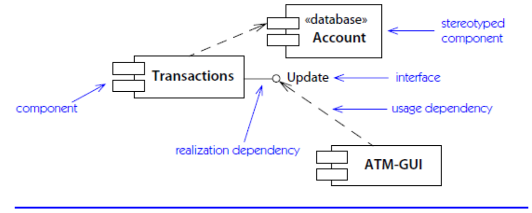
Component with interfaces

UML Interfaces: Lollipops and Sockets

- A UML interface describes a group of operations used or created by UML components.
  - There are two types of interfaces: provided and required interfaces.
    - A provided interface is modeled using the lollipop notation 
    - A required interface is modeled using the socket notation. 

Component

- Also as we described before, a component diagram shows dependencies among components



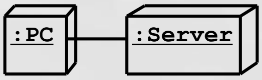
Component diagram

Node

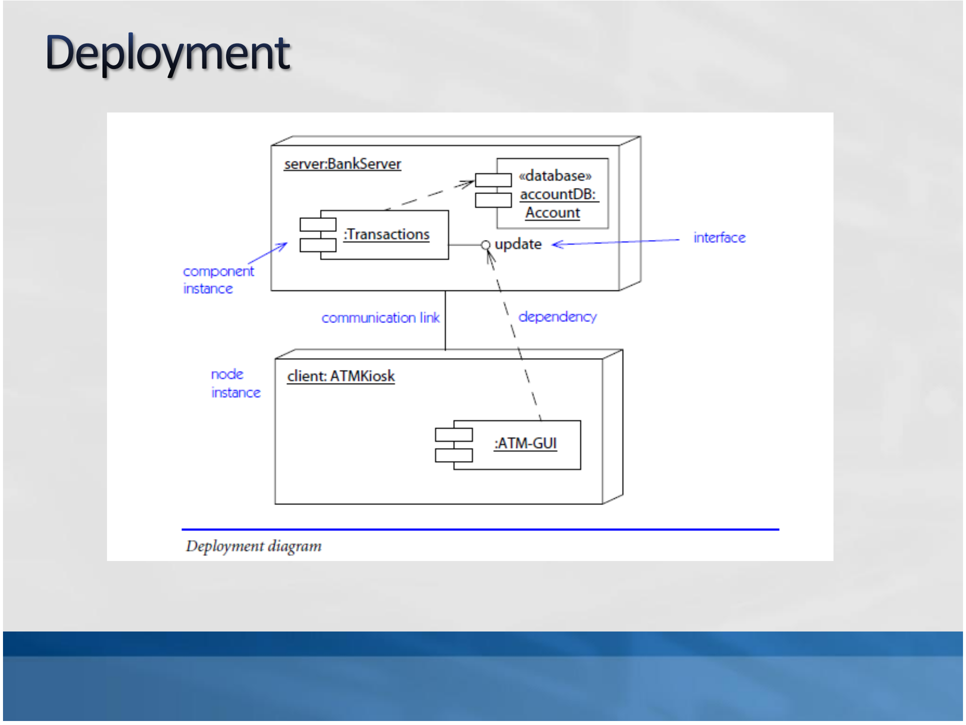
- A node is a run-time physical object that represents a computational resource, generally having at least a memory and often processing capability as well.
- Nodes may have stereotypes to distinguish different kinds of resources, such as CPUs, devices, and memories.
- A node is shown as a stylized cube with the name of the node and, optionally, its classification
- Associations between nodes represent communication paths.

Deployment Diagram

- Deployment diagrams are useful for showing a system design after these system design decisions have been made:
  - Subsystem decomposition
  - Concurrency
  - Hardware/Software Mapping

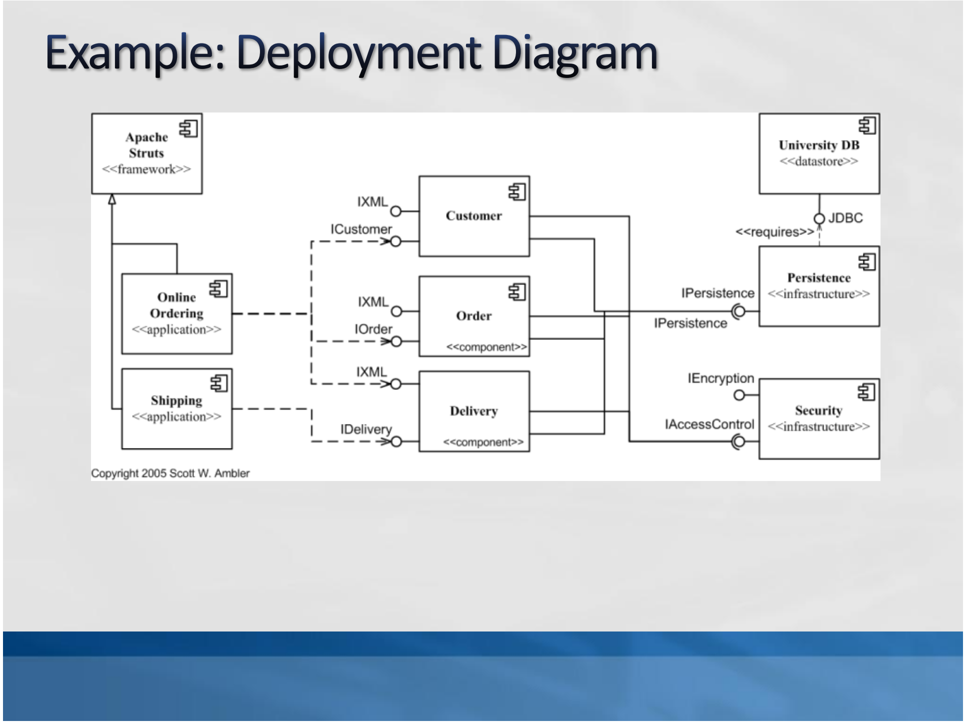


- A deployment diagram is a graph of nodes and connections ("communication associations")
  - Nodes are shown as 3-D boxes
  - Connections between nodes are shown as solid lines
  - Nodes may contain components
    - Components can be connected by "lollipops" and "grabbers"
    - Components may contain objects (indicating that the object is part of the component).



Deployment

Deployment diagram



Example: Deployment Diagram

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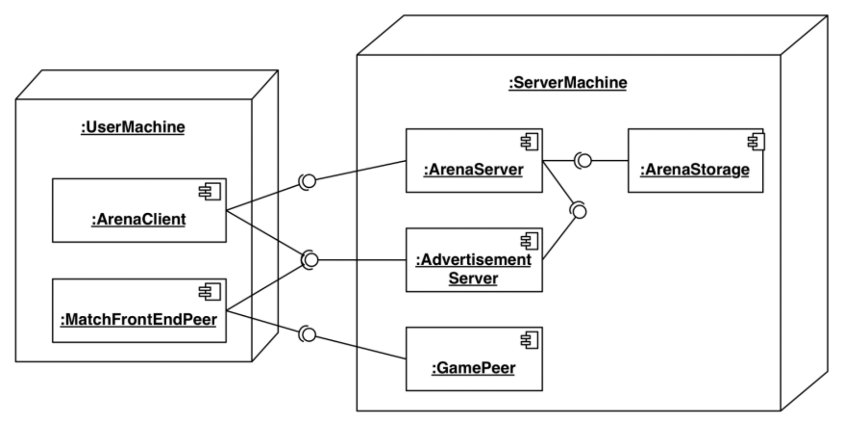
Another Example : Deployment Diagram



Example:

- Draw a component and a deployment diagram for your project.