Chapter 11 Describe Distribution

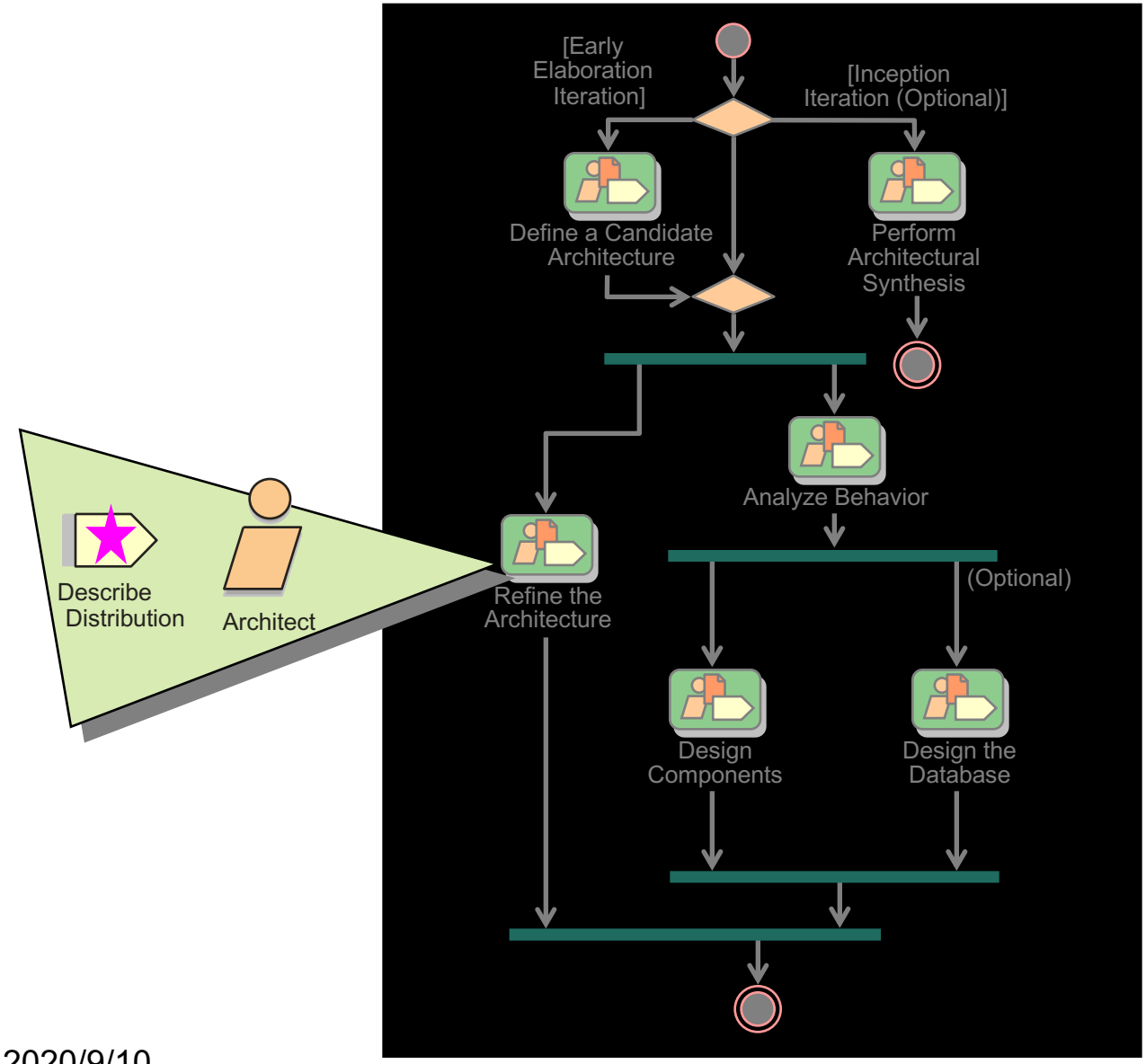
Agenda

- Objectives
- Describe Distribution in Context
- Describe Distribution Steps
- Exercises

Objectives: Describe Distribution

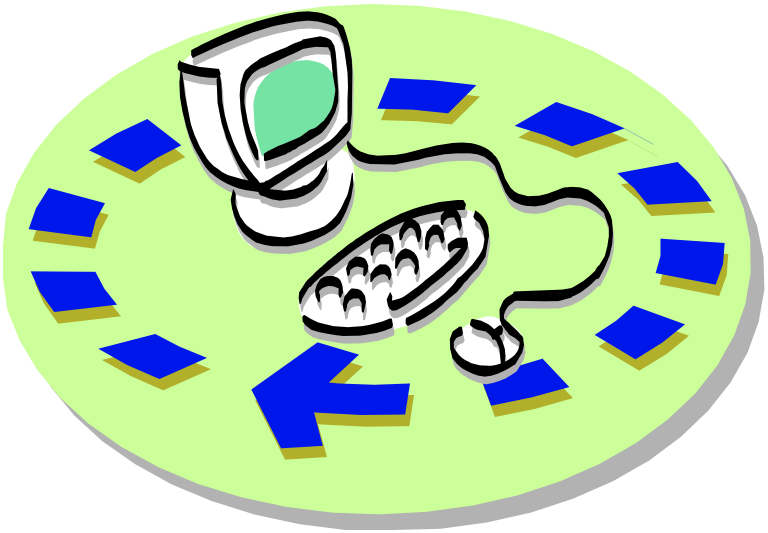
- Describe how a network configuration can be defined
- Describe how the functionality of the system can be distributed across physical nodes
- Explain the relationship between a model element and its implementation

Describe Distribution in Context



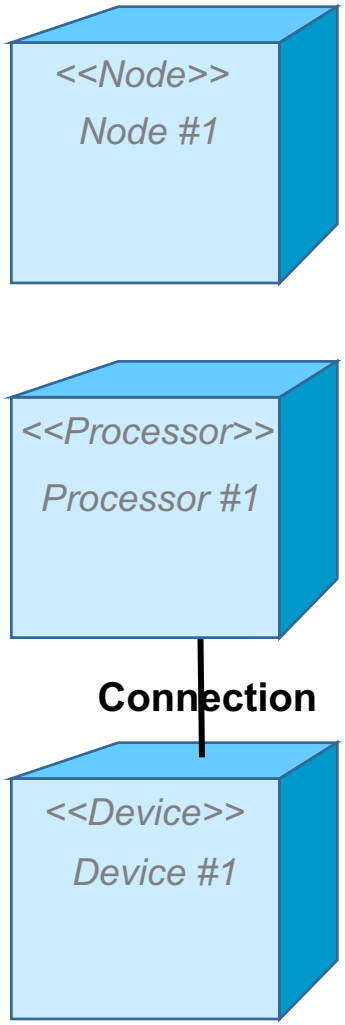
Describe Distribution Steps

- Define the network configuration
- Allocate system elements to nodes



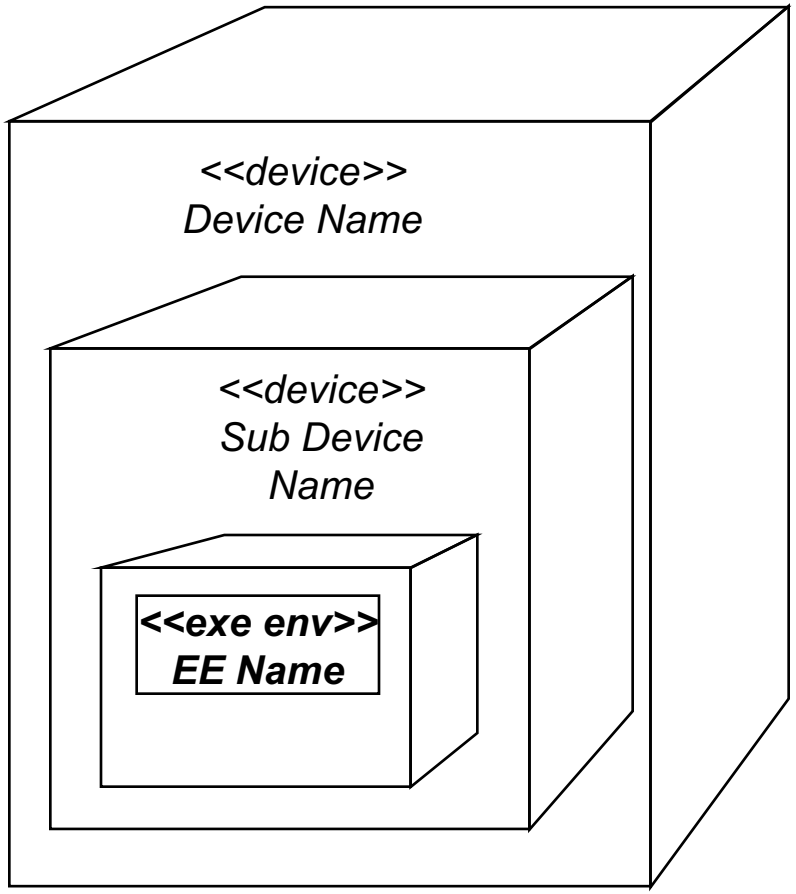
Deployment Model Modeling Elements

- Node
  - Physical run-time computational resource
  - Processor node - Executes system software
  - Device node
    - Support device
    - Typically controlled by a processor
- Connection
  - Communication mechanism
  - Physical medium
  - Software protocol



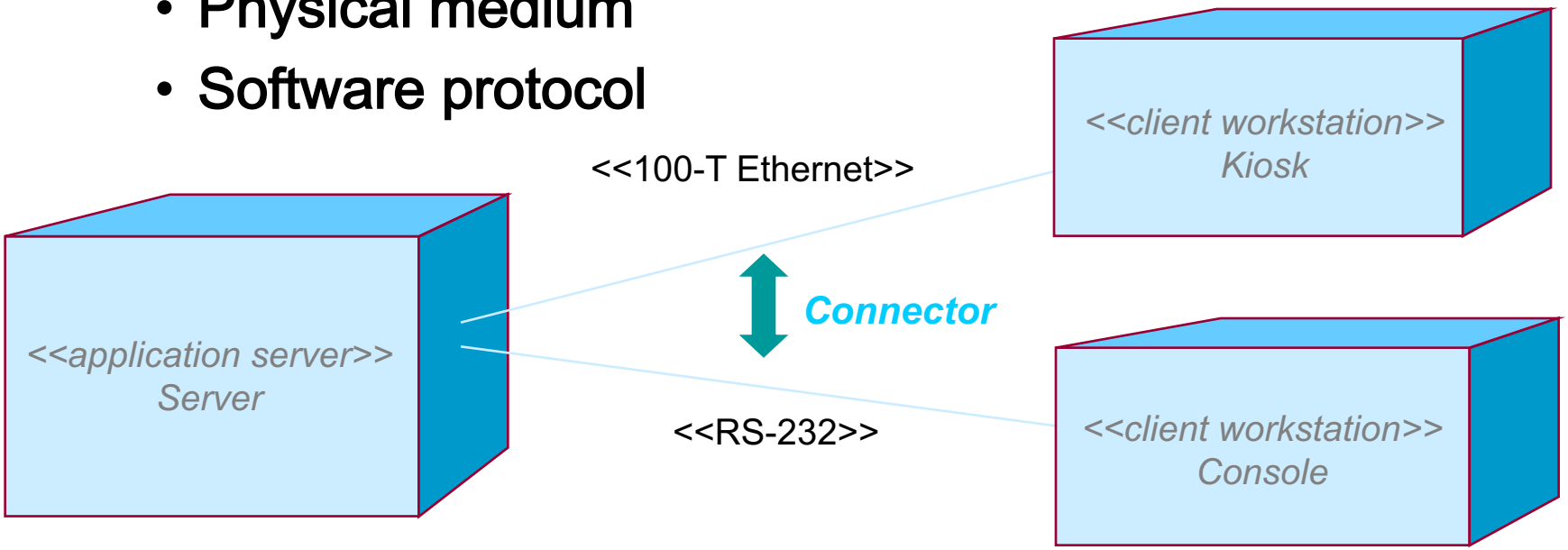
What Is a Node?

- Represents a run-time computational resource, and generally has at least memory and often processing capability.
- Types:
  - Device - Physical computational resource with processing capability. Devices may be nested
  - Execution Environment - Represents particular execution platforms

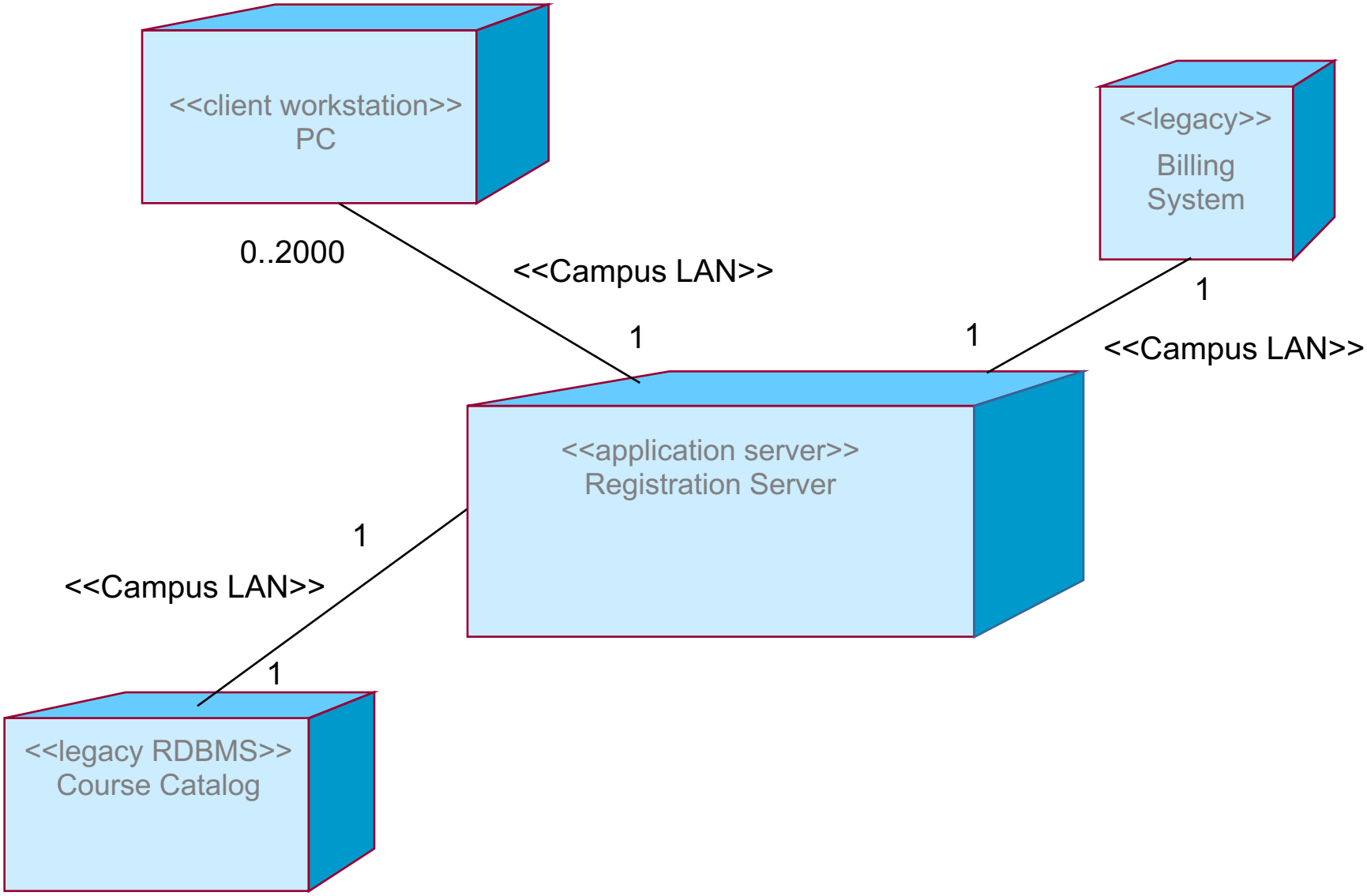


What Is a Connector?

- A connector represents a communication mechanism described by:
  - Physical medium
  - Software protocol



Example: Deployment Diagram

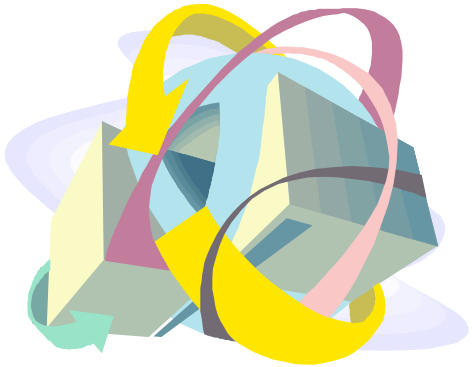


Describe Distribution Steps

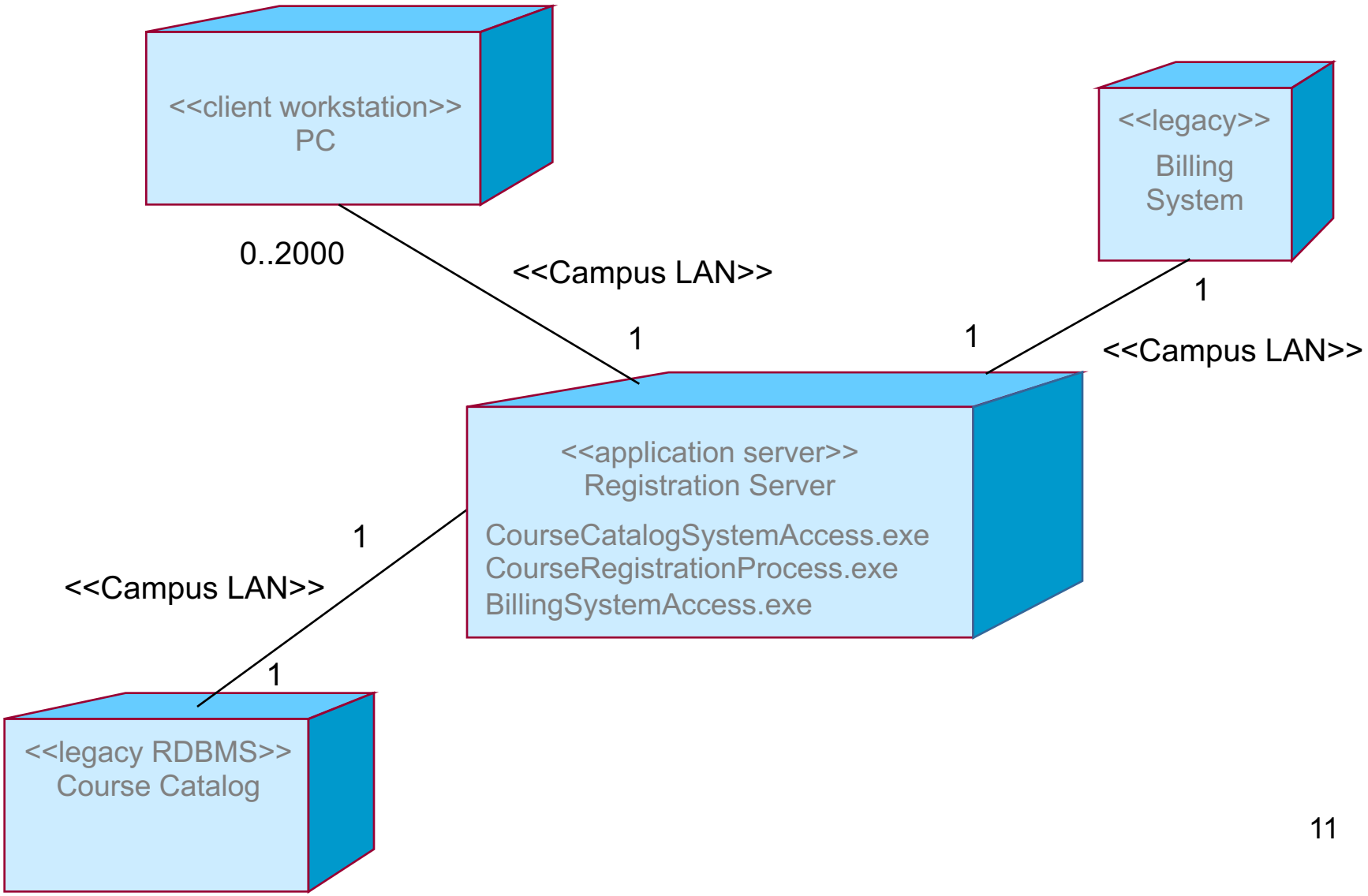
- **Define the network configuration**
  - **Allocate system elements to nodes**

Process-to-Node Allocation Considerations

- Distribution patterns
- Response time and system throughput
- Minimization of cross-network traffic
- Node capacity
- Communication medium bandwidth
- Availability of hardware and communication links
- Rerouting requirements



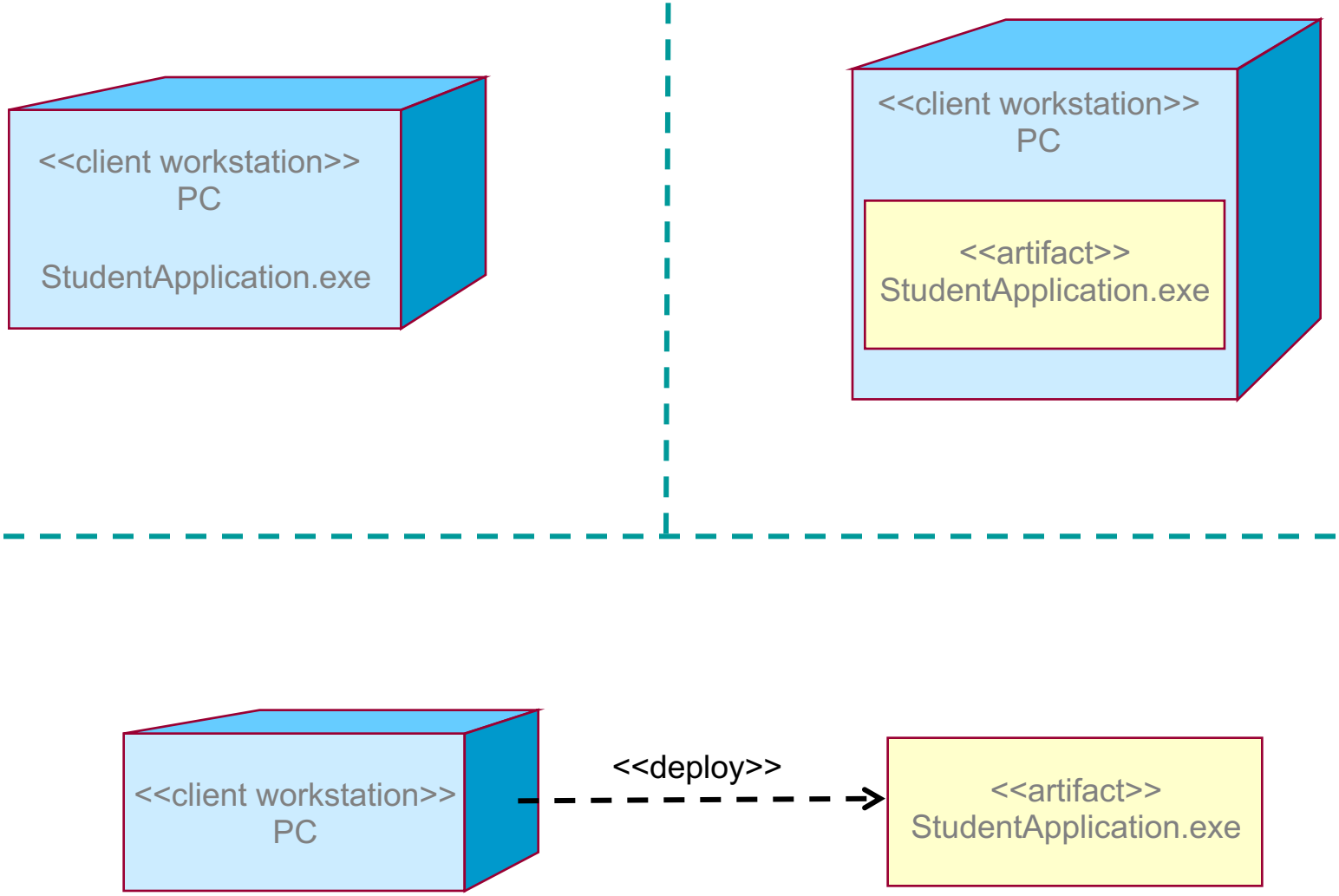
Example: Deployment Diagram with Processes (2.0)



What is Deployment?

- **Deployment is the assignment, or mapping, of software artifacts to physical nodes during execution.**
  - **Artifacts are the entities that are deployed onto physical nodes**
    - **Processes are assigned to computers**
- **Artifacts model physical entities.**
  - **Files, executables, database tables, web pages, and so on.**
- **Nodes model computational resources.**
  - **Computers, storage units**

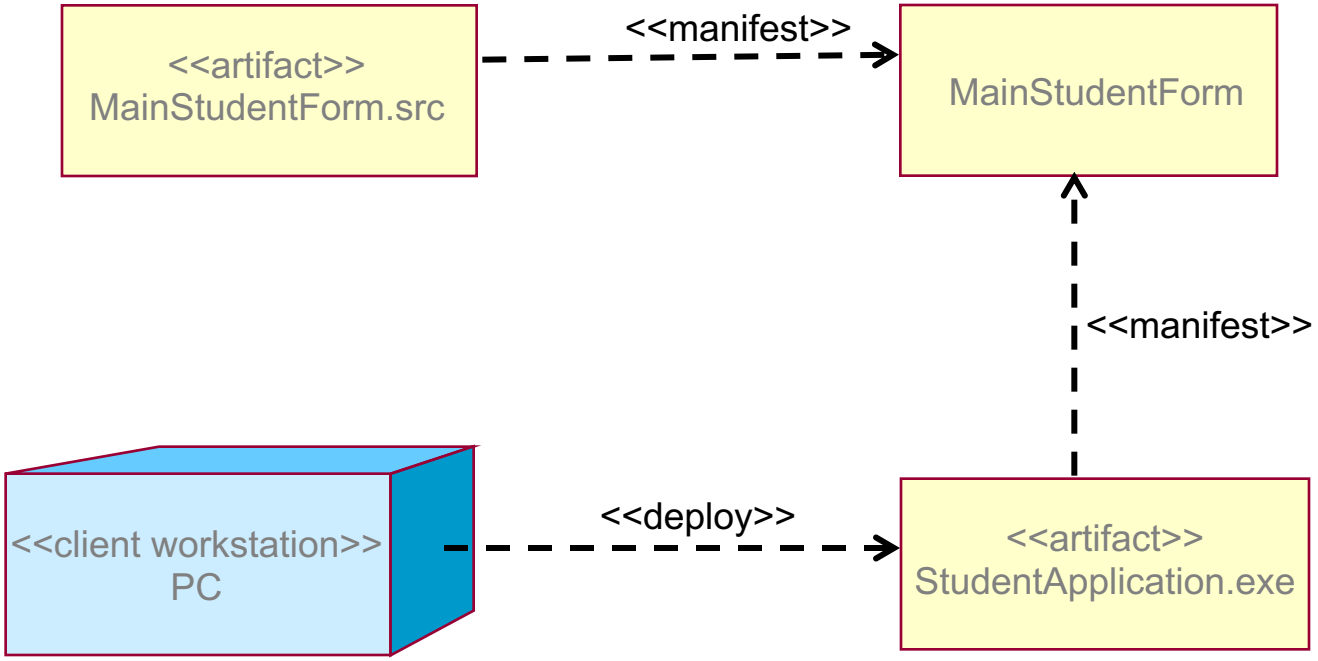
Example: Deploying Artifacts to Nodes



What is Manifestation?

- The physical implementation of a model element as an artifact.
  - A relationship between the model element and the artifact that implements it
  - Model elements are typically implemented as a set of artifacts.
  - Examples of Model elements are source files, executable files, documentation file

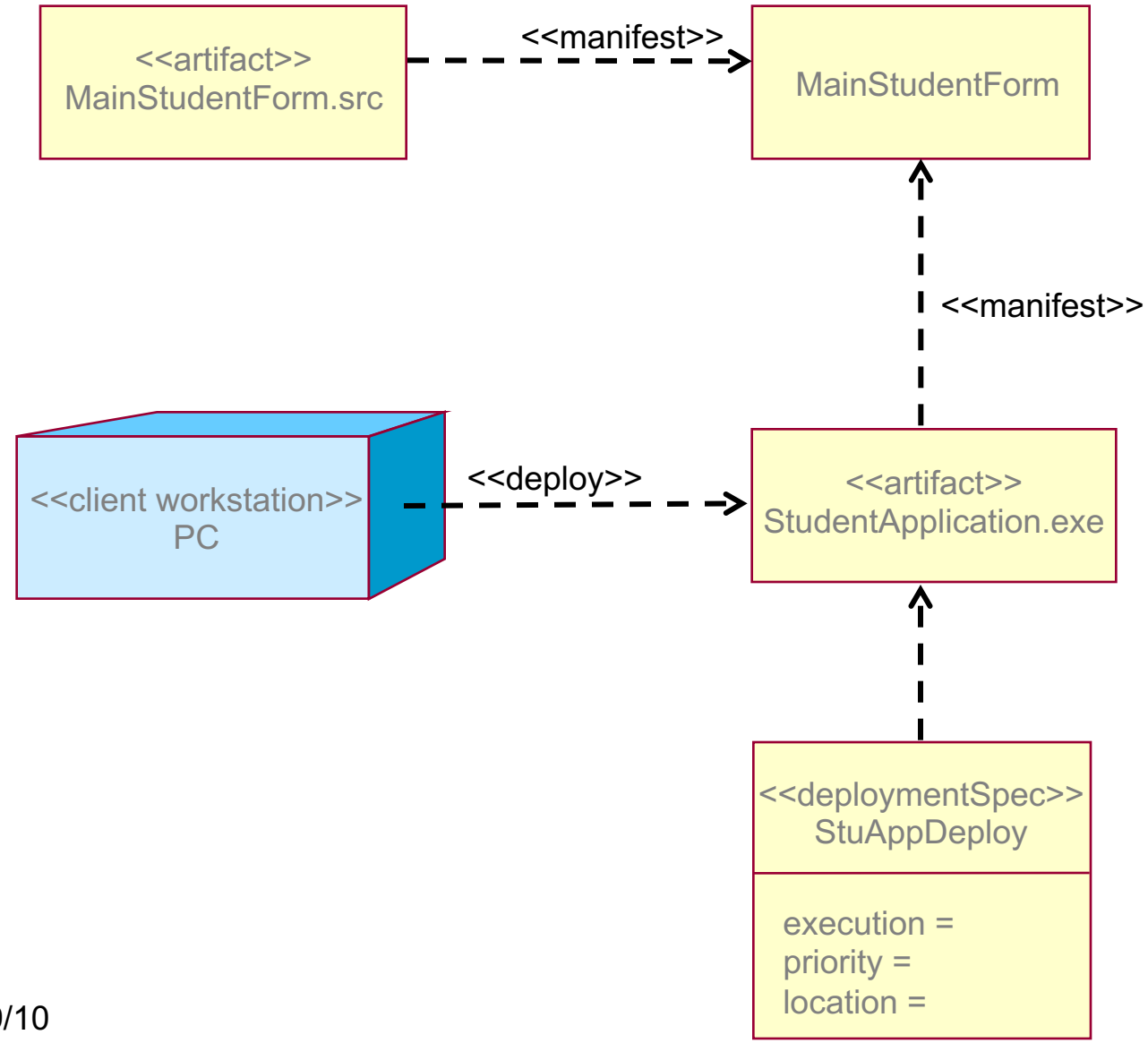
Example: Manifestation



What is a Deployment Specification?

- A detailed specification of the parameters of the deployment of an artifact to a node
  - May define values that parameterize the execution

Example: Deployment Specification



作业

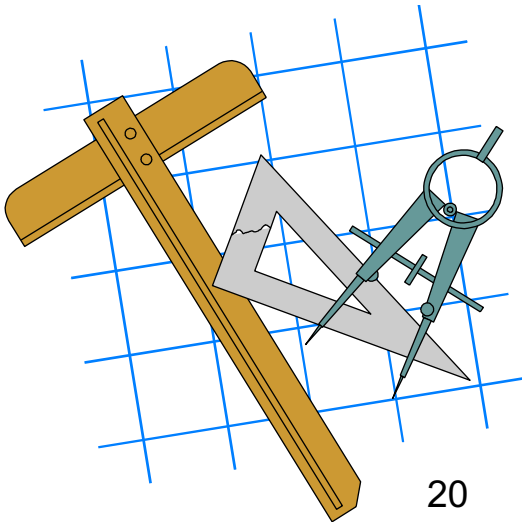
- What are the essential elements of a deployment diagram?
- What is meant by deployment?
- What is manifestation?
- What is a deployment specification?

Lab: Describe Distribution

- Given the following textual information:
  - Network configuration (for example, nodes and their connectors)
    - What processes run on what nodes?
      - Exercise Workbook: *A*rchitecture Handbook, Deployment View section

Lab: Describe Distribution (continued)

- Produce the following:
  - A Deployment diagram depicting:
    - Nodes
    - Connectors
    - What processes run on what nodes



Lab: Review

- Compare your Deployment Model with those developed by the rest of the class.
  - Have nodes and node connections been modeled?
  - Have processes been identified and assigned to nodes? Do the allocations make sense?
  - Are the processes listed beneath the nodes in the Deployment diagram?