SE-2002
SOFTWARE DESIGN AND ARCHITECTURE
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Implementation diagrams
Lecture # 34, 35, 36

DEPLOYMENT DIAGRAMS

- Deployment diagrams are parts of the Physical view.

- This view is concerned with the physical elements of your system, such as executable software files and the hardware they run on.

- Deployment diagrams bring the software into real world by showing how software gets assigned to hardware and how the pieces communicate.
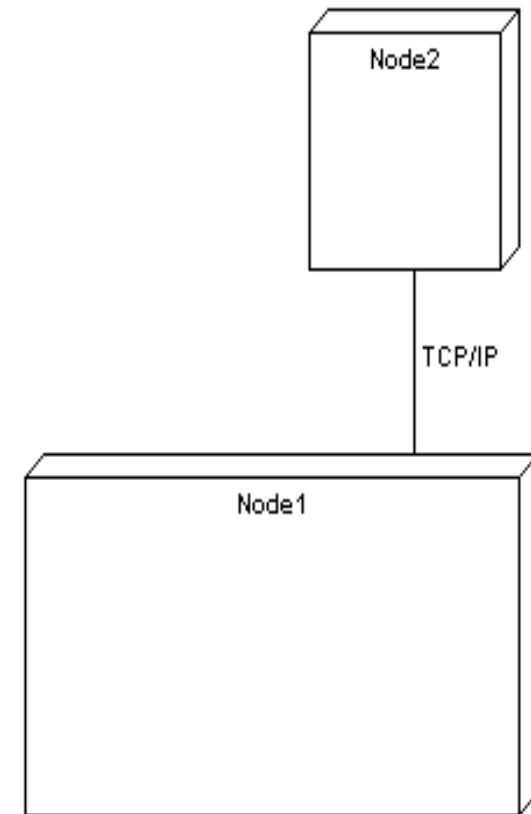
DEPLOYMENT DIAGRAMS

- There is a strong link between components diagrams and deployment diagrams

- Deployment diagrams show the physical relationship between hardware and software in a system

- Hardware elements:

  - Computers (clients, servers)

  - Embedded processors

  - Devices (sensors, peripherals)

- Are used to show the nodes where software components reside in the run-time system

PURPOSE OF DEPLOYMENT DIAGRAMS

- They show the structure of the run-time system

- They capture the hardware that will be used to implement the system and the links between different items of hardware.

- They model physical hardware elements and the communication paths between them

- They can be used to plan the architecture of a system.

- They are also useful for Document the deployment of software components or nodes

DEPLOYMENT DIAGRAMS

- Contains nodes and connections

- A node usually represent a piece of hardware in the system.(represented by three dimensional box)

- A connection depicts the communication path used by the hardware to communicate.

- Usually indicates the method such as TCP/IP

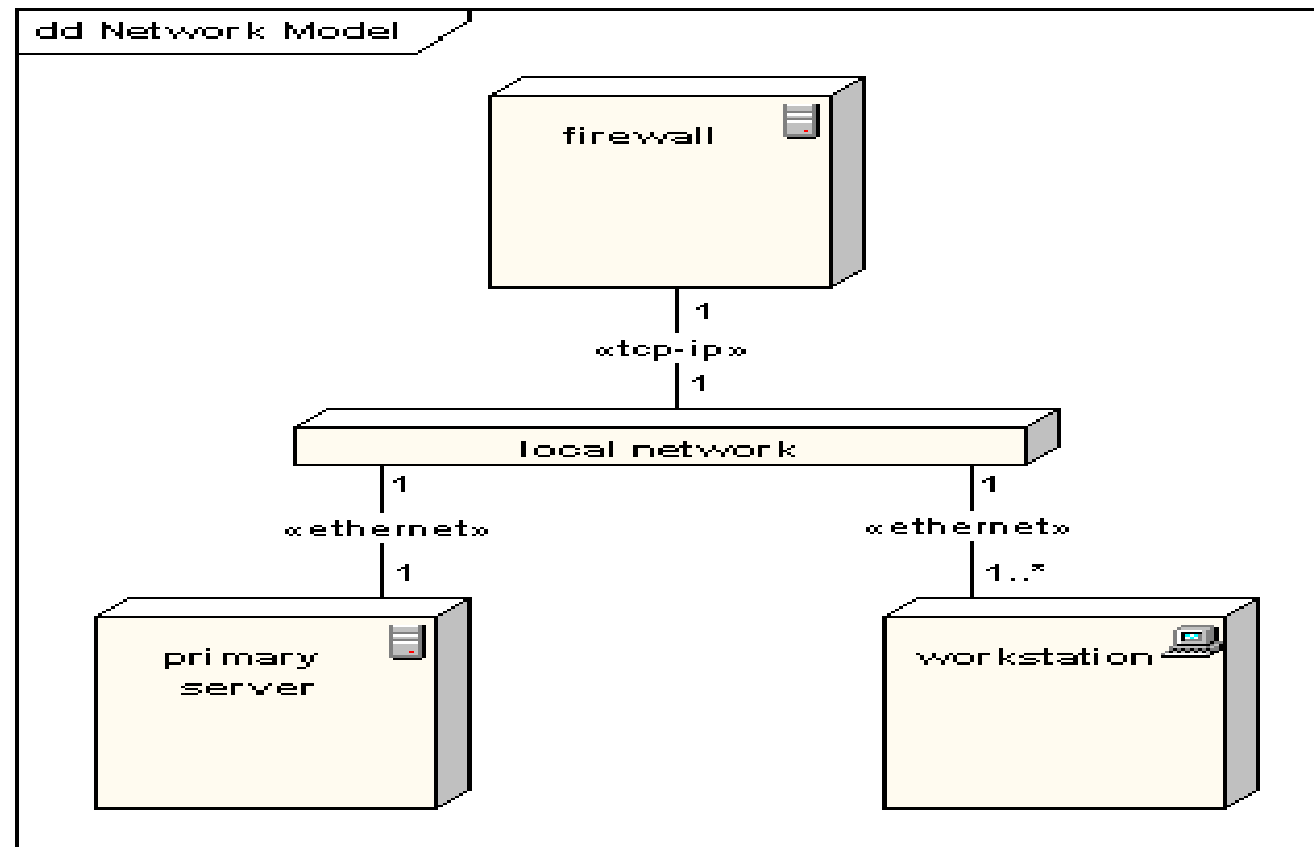Node2

TCP/IP

Node1

NODES

- Nodes can be:
- Hardware nodes:
  - Server
  - Desktop PC
  - Disk drive
- Execution nodes:
  - Operating system
  - J2EE container
  - Web server
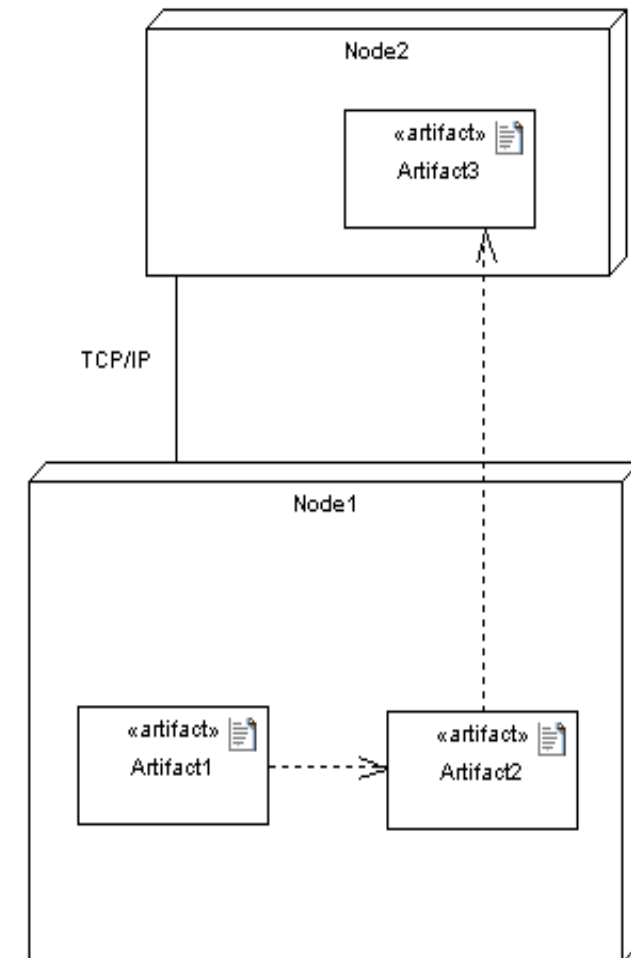 - Application server
- Nodes can be nested,
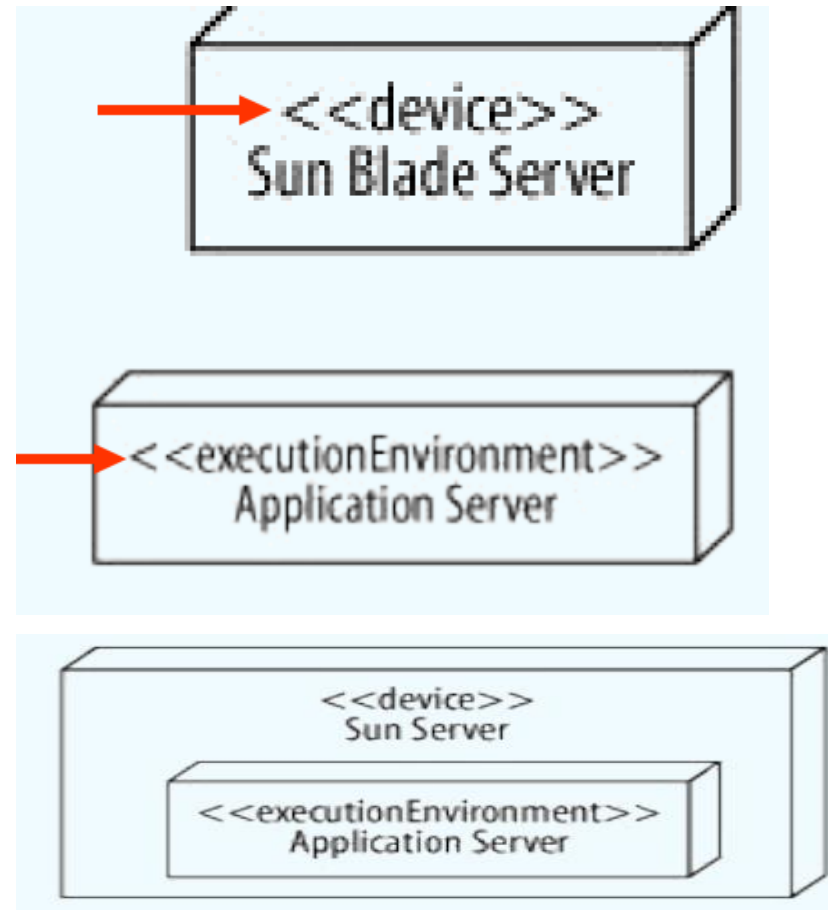
NODES AND CONNECTIONS

DEPLOYMENT DIAGRAMS

- Deployment diagrams contain artifact

- An artifact is the specification of a physical piece of information

  - Ex: source files, binary executable files, table in a database system, executable files, configuration files,….

- Artifacts are physical files that execute or are used by your software

- An artifact is denoted by a rectangle showing the artifact name, the «artifact» keyword and a document icon,
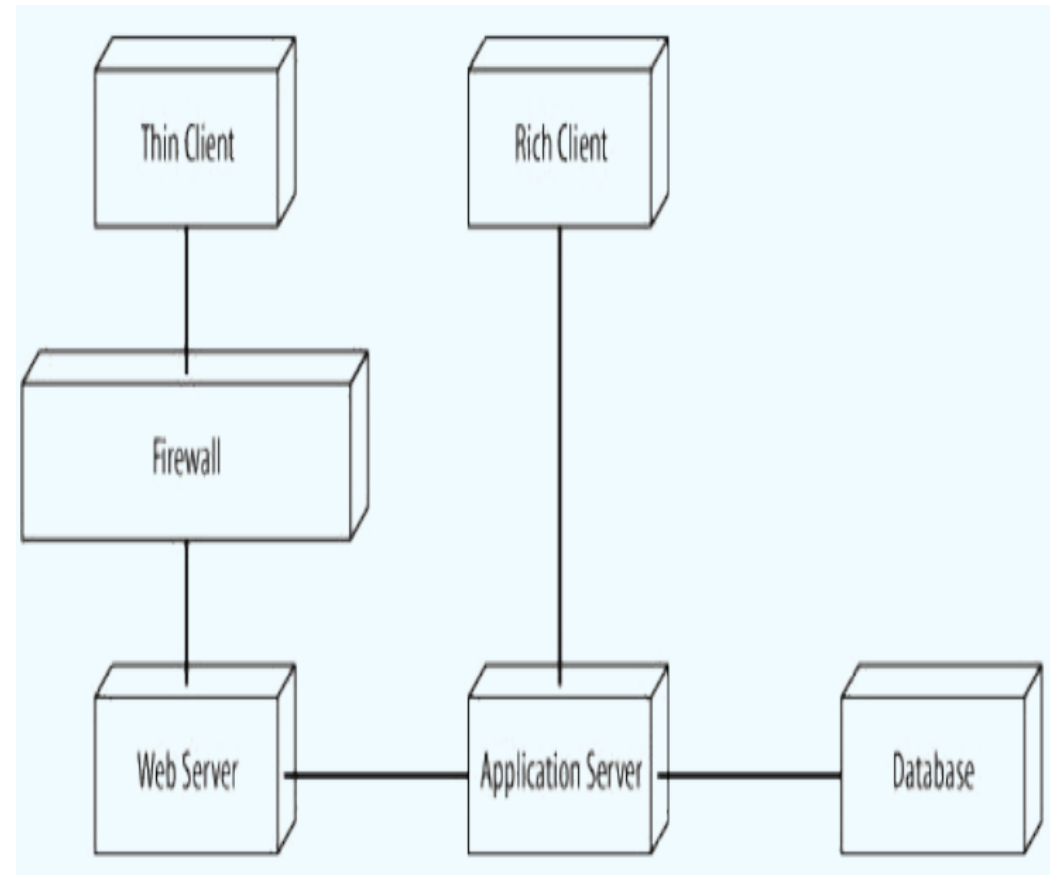
ARTIFACTS
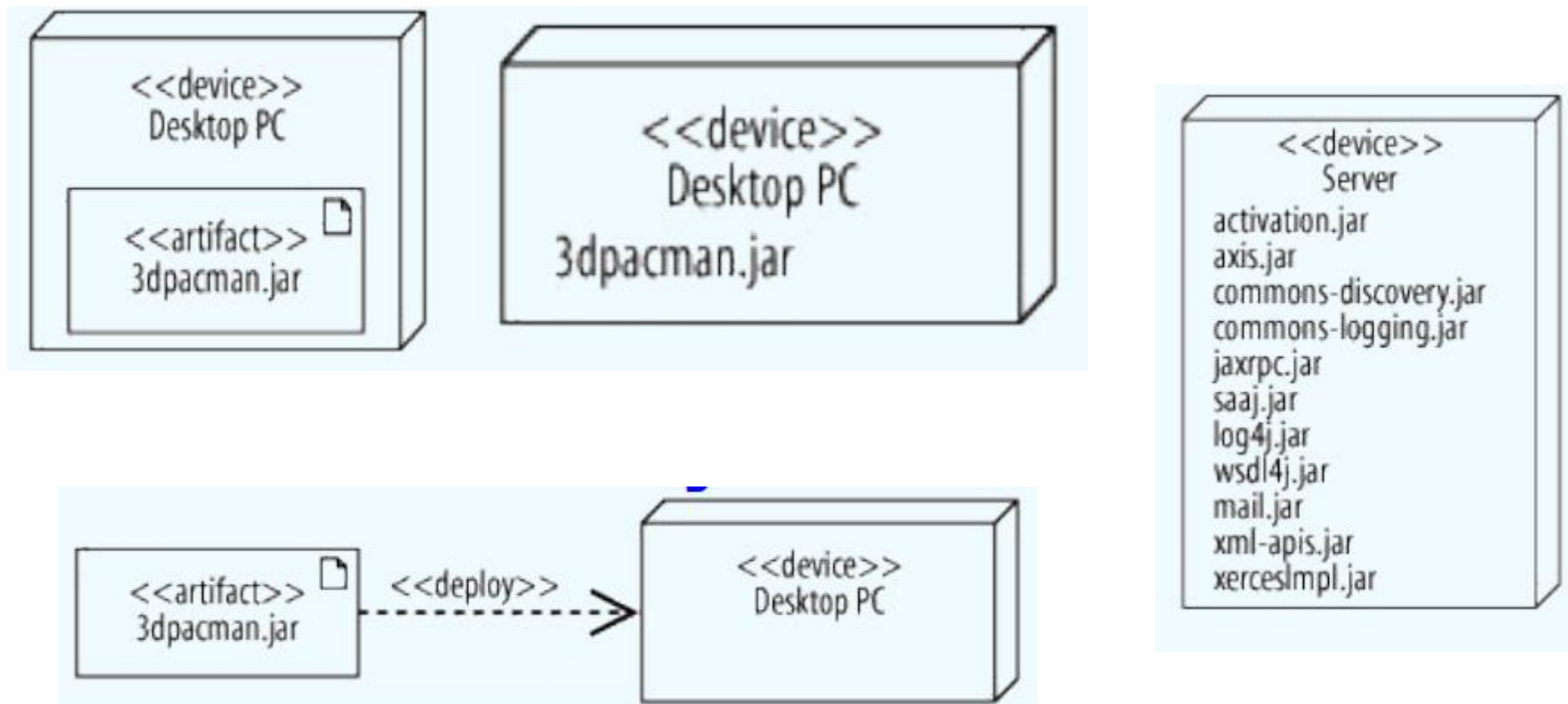
WHEN TO USE?

- At the early stage: helps figuring out the general configuration.

- Example: a web application will include:

  - A web server, application server and database

  - Clients access the application through browsers
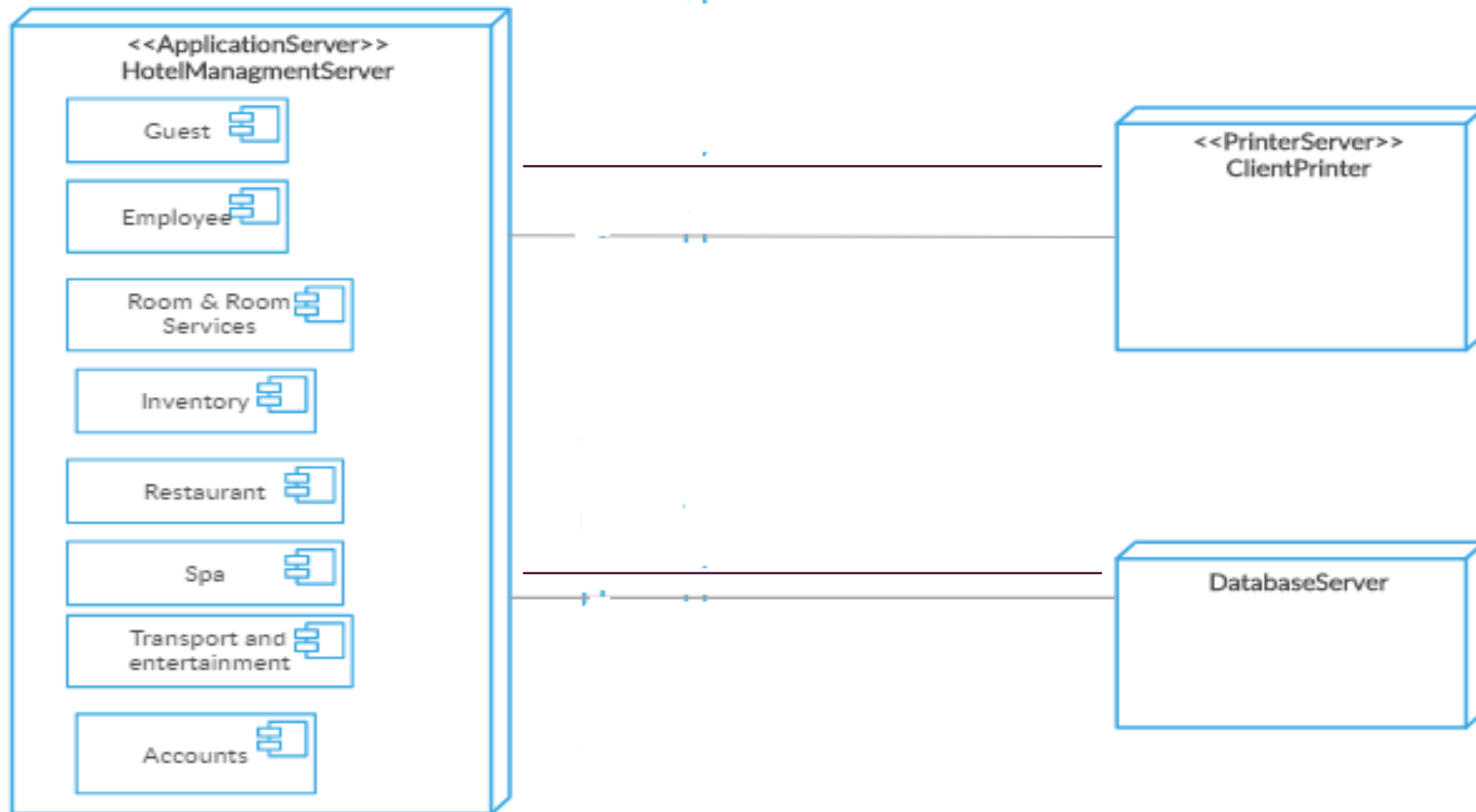
  - The web server should have a firewall
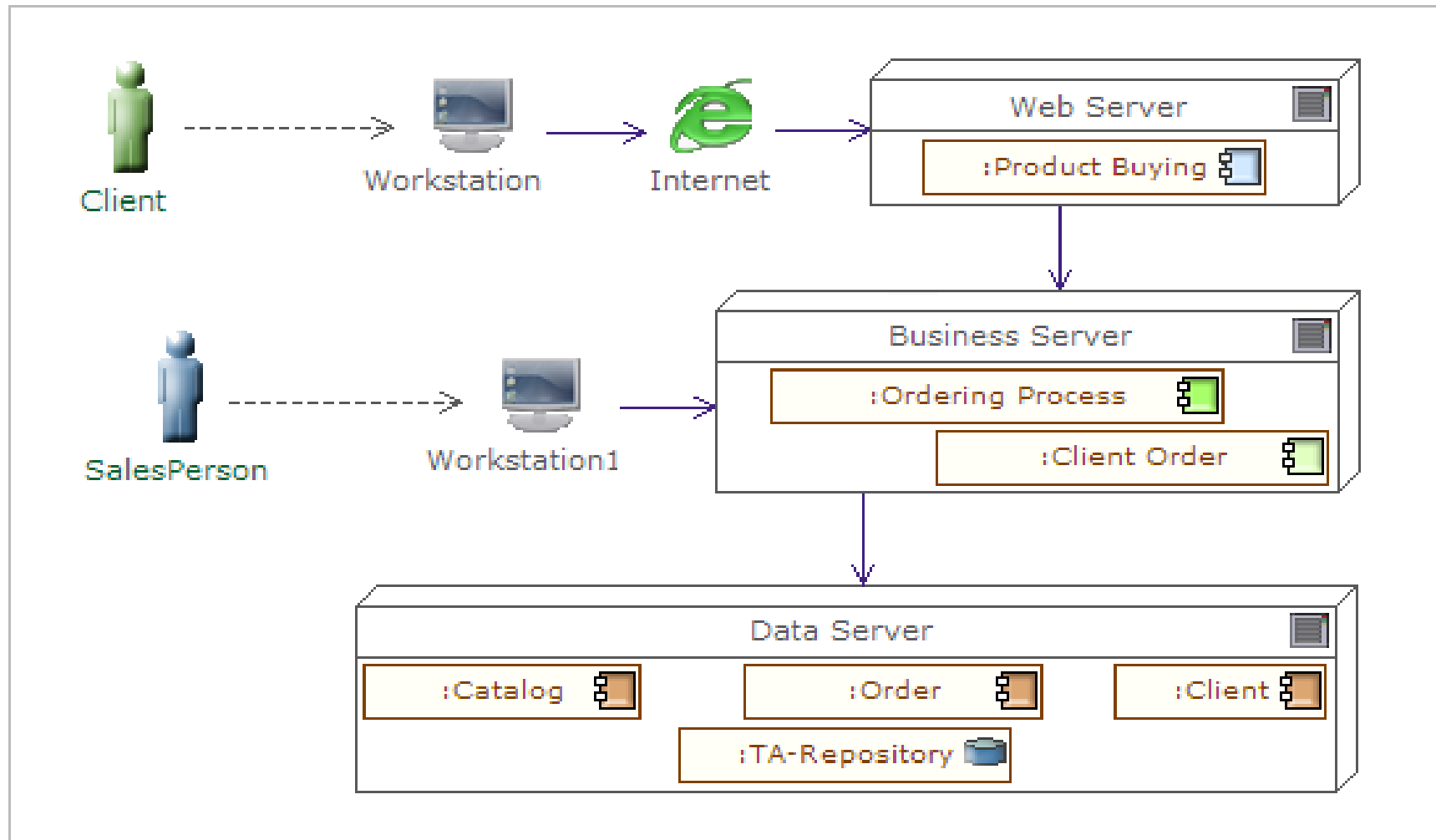
WHEN TO USE?

- At the later stages: the deployment diagram will come into details about the system architecture.
    - Which technology is used
    - What communication protocols are used
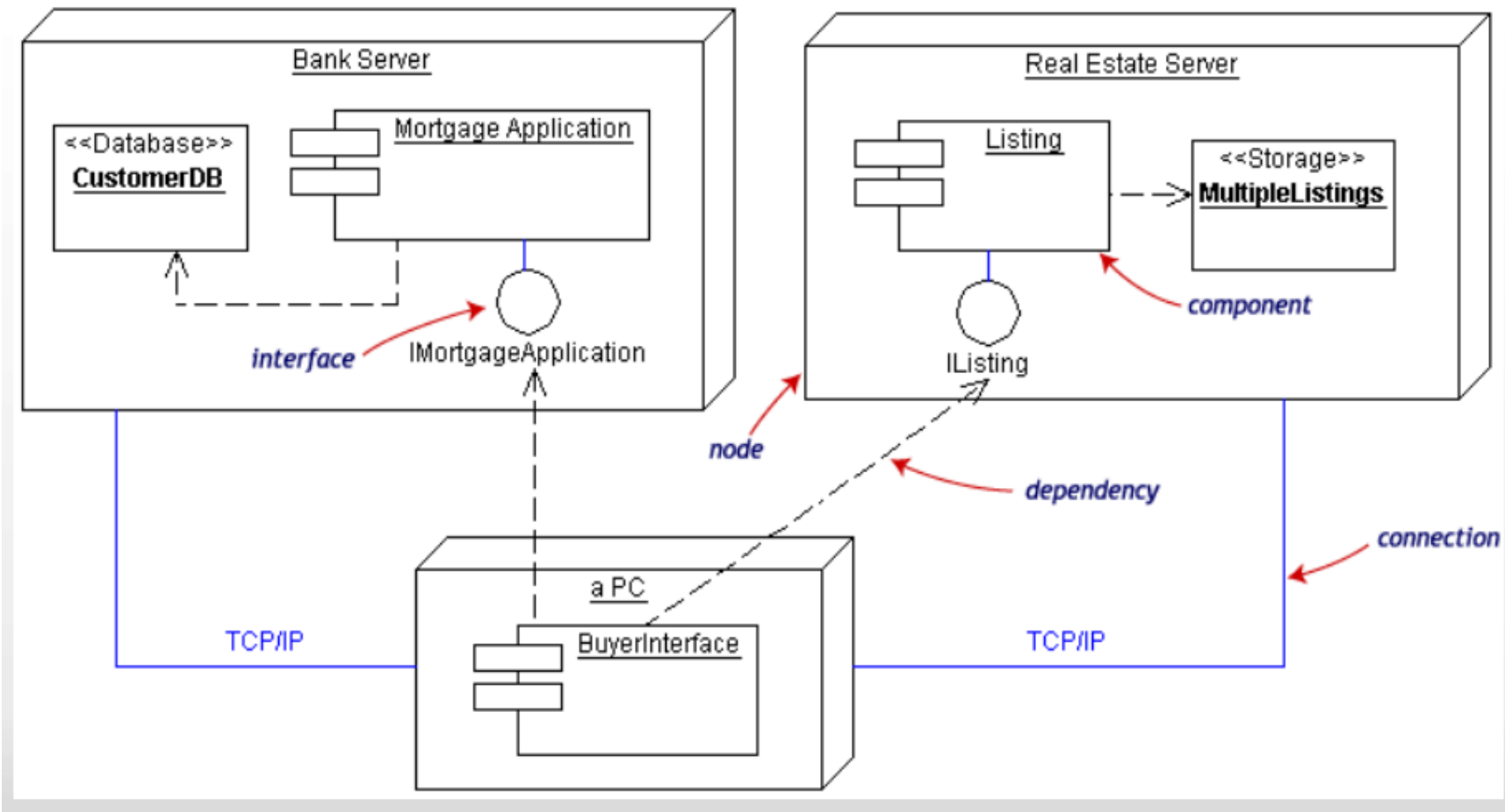   - Software artifacts
    - etc.
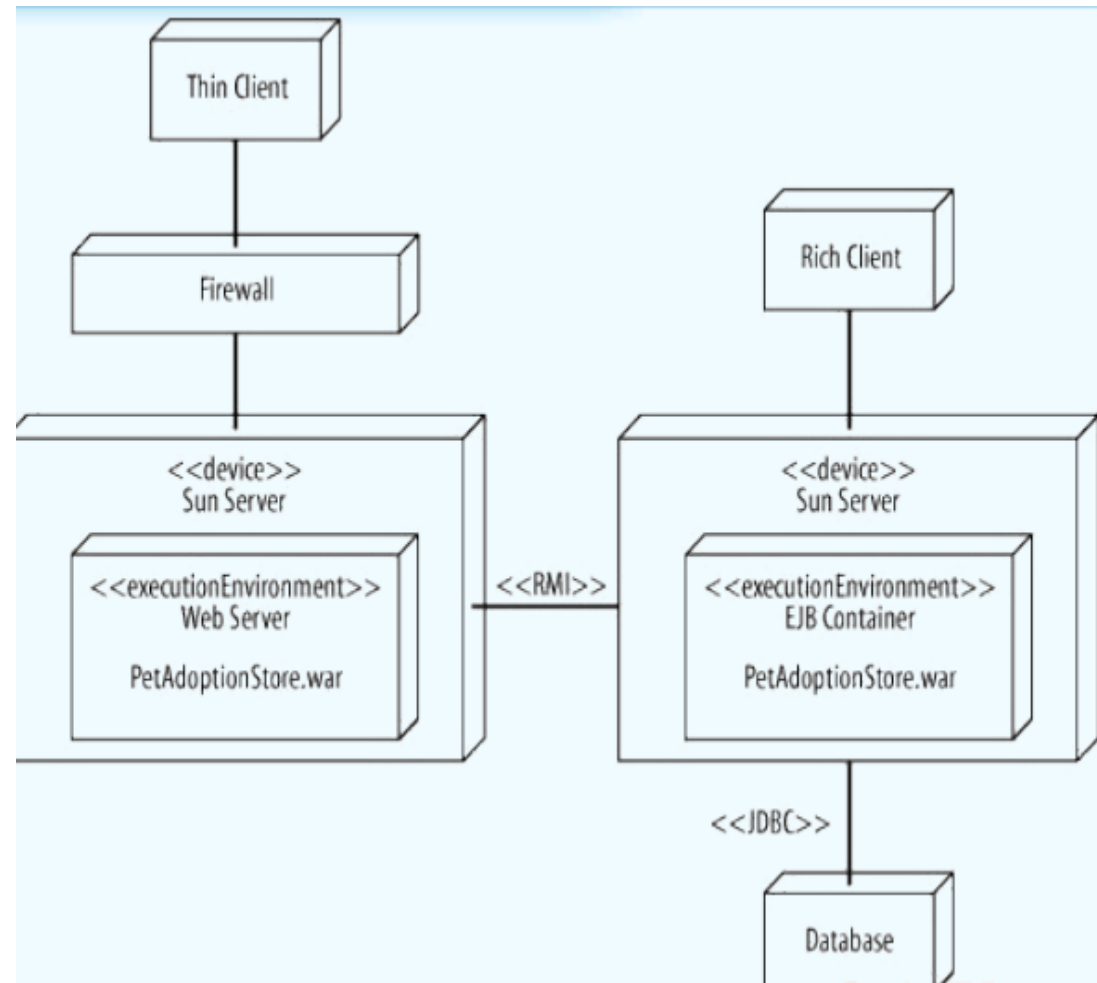
DEPLOYMENT DIAGRAMS EXAMPLE

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DEPLOYMENT DIAGRAM: THE APPLE ITUNES APPLICATION

- The iTunes setup can be downloaded from the iTunes website, and also it can be installed on the home computer. Once the installation and the registration are done, iTunes application can easily interconnect with the Apple iTunes store. Users can purchase and download music, video, TV serials, etc. and cache it in the media library.

- Devices like Apple iPod Touch and Apple iPhone can update its own media library from the computer with iTunes with the help of USB or simply by downloading media directly from the Apple iTunes store using wireless protocols, for example; Wi-Fi, 3G, or EDGE.

That is all