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Distributed Processing with J2EE Technology

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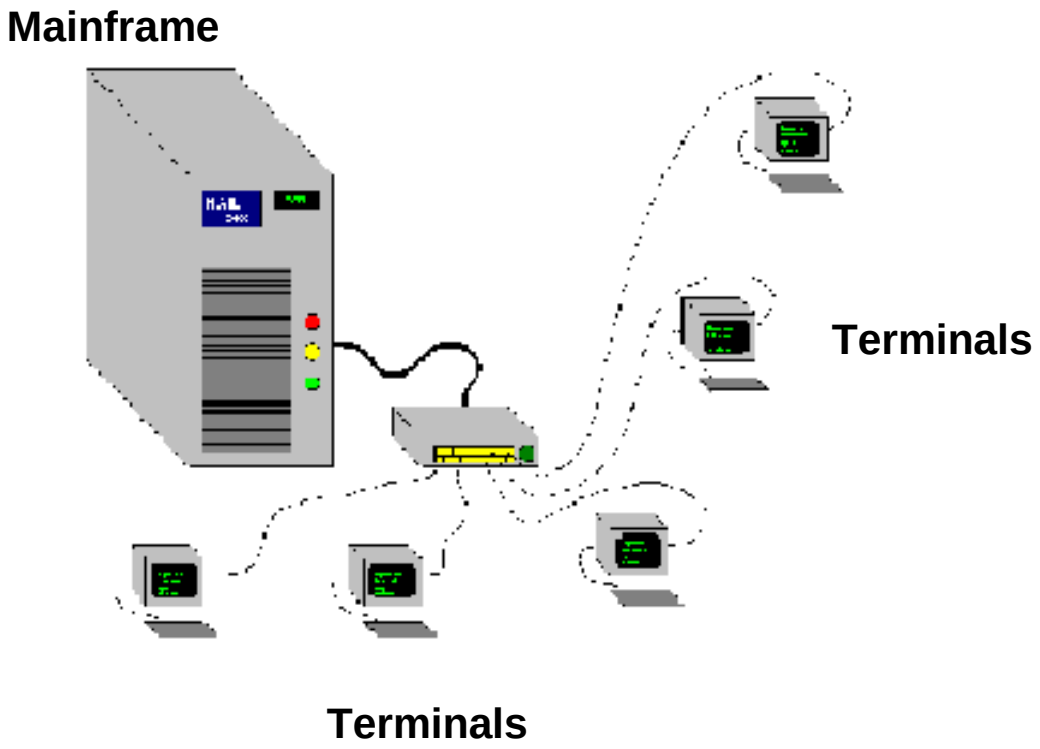
Objectives

- Differentiate between client-server and multi-tier architecture
- List the advantages and issues with distributed architectures
- List the advantages of J2EE
- Discuss the goals and scope of J2EE and EJB
- List two primary features of the EJB specification
- List two benefits of an EJB solution

Centralized Architecture

- Operation is centralized
- And non-distributed



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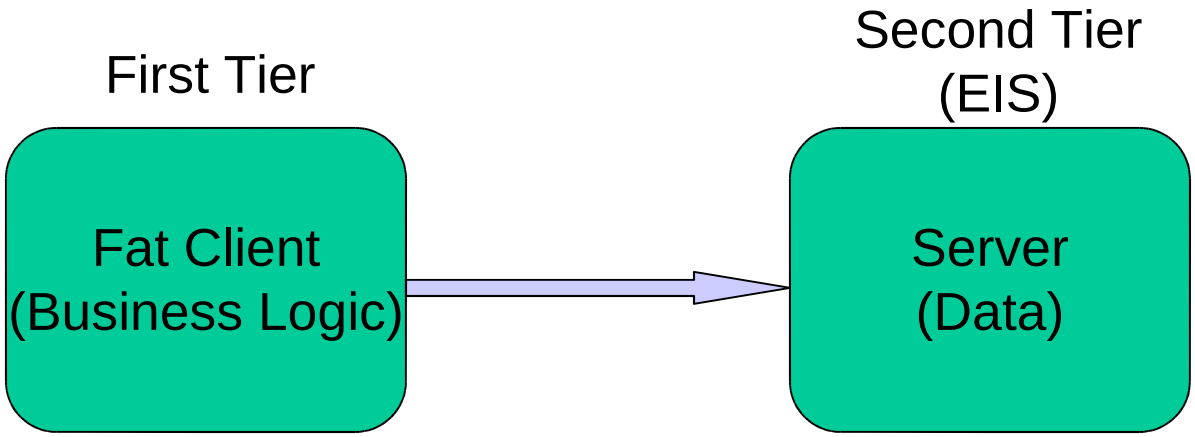
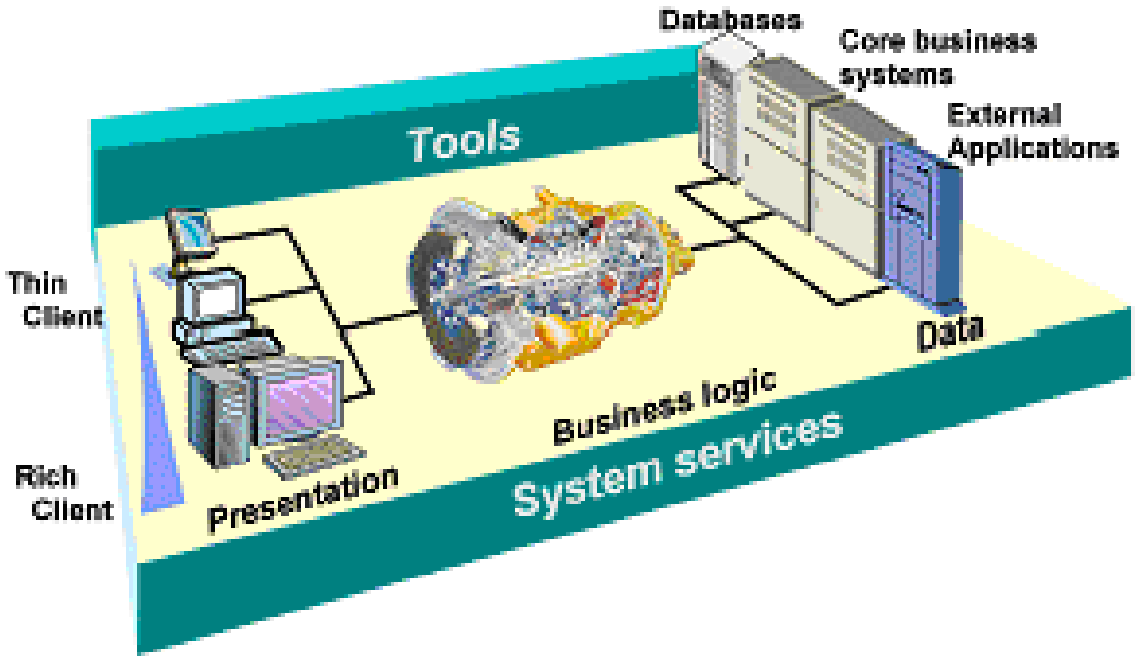
Client-Server (Two-tier) Architecture

- Work is somewhat distributed
- Clients are fat



Three-tier Architecture

- Business logic moves towards the EIS and is separated from client
- Clients can be thin!
- Many advantages!



Advantages of Three-tier Distributed Technology

- **Scalability**
  Ability to add additional computing resources to accommodate increasing client loads without changing the application.

- **Reliability and Availability**
  Separation of presentation and business logic tends to make the system more reliable and available.

- **Extensibility**
  Ability to add additional functionality without impacting existing functionality.

- **Software Resource Balancing**
  Ability of many machines or processes to request the resources or services of other machines or processes.

- **Security**
  Authentication and authorization issues – For a complete corruption, a hacker has to break three tiers.

Issues With Distributed Architecture

- Additional complexity

  Modern applications are inherently complex. In case of a failure, finding the exact point of failure may be difficult.

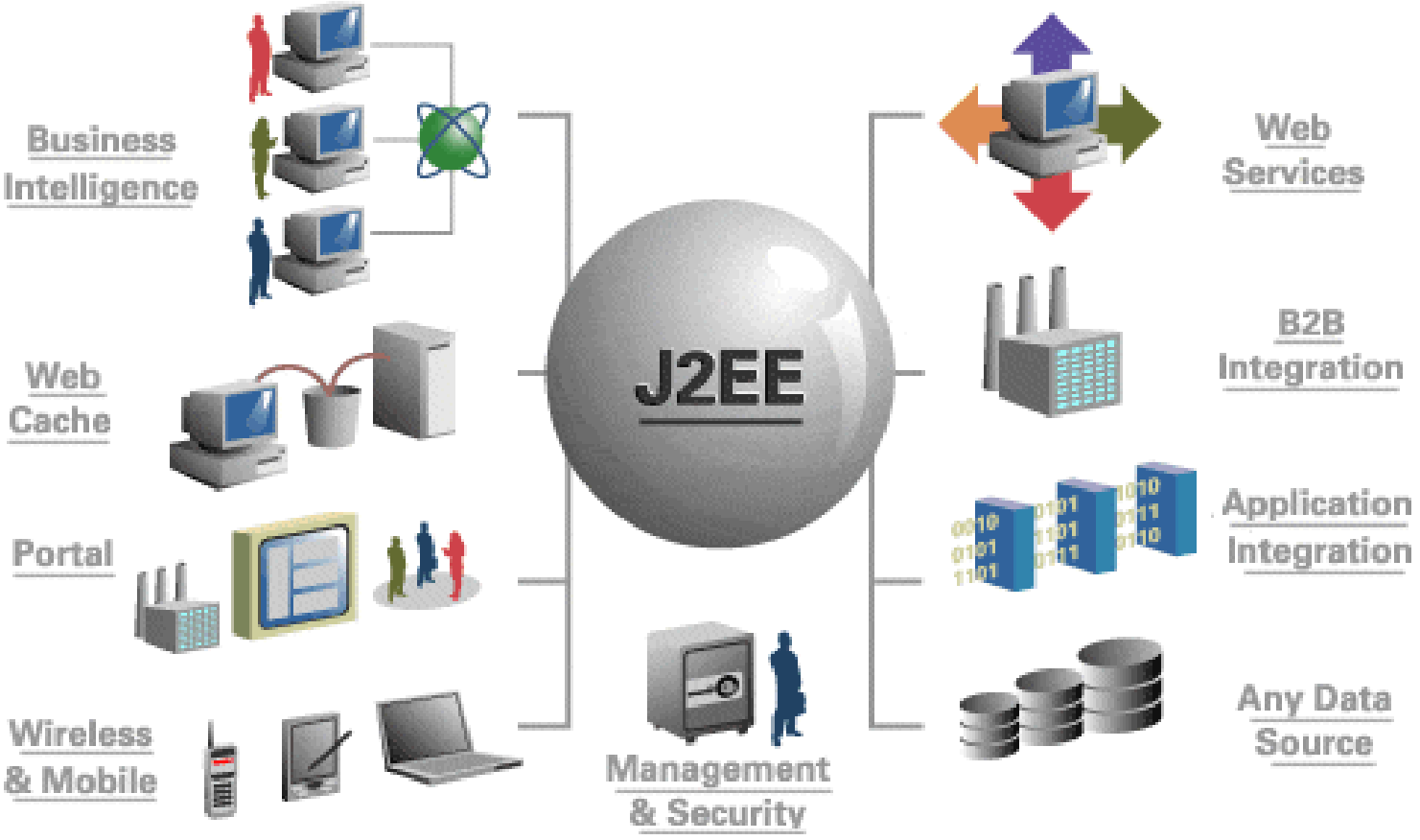
- Multiple points of failure

  Problems can occur at many locations. But a system may still work as opposed to a client-server architecture where a failure may severely affect the operation.

- Network Bandwidth

  An additional bandwidth is required for the operation and hence the system is required to have a good architecture.

Enterprise Complexity

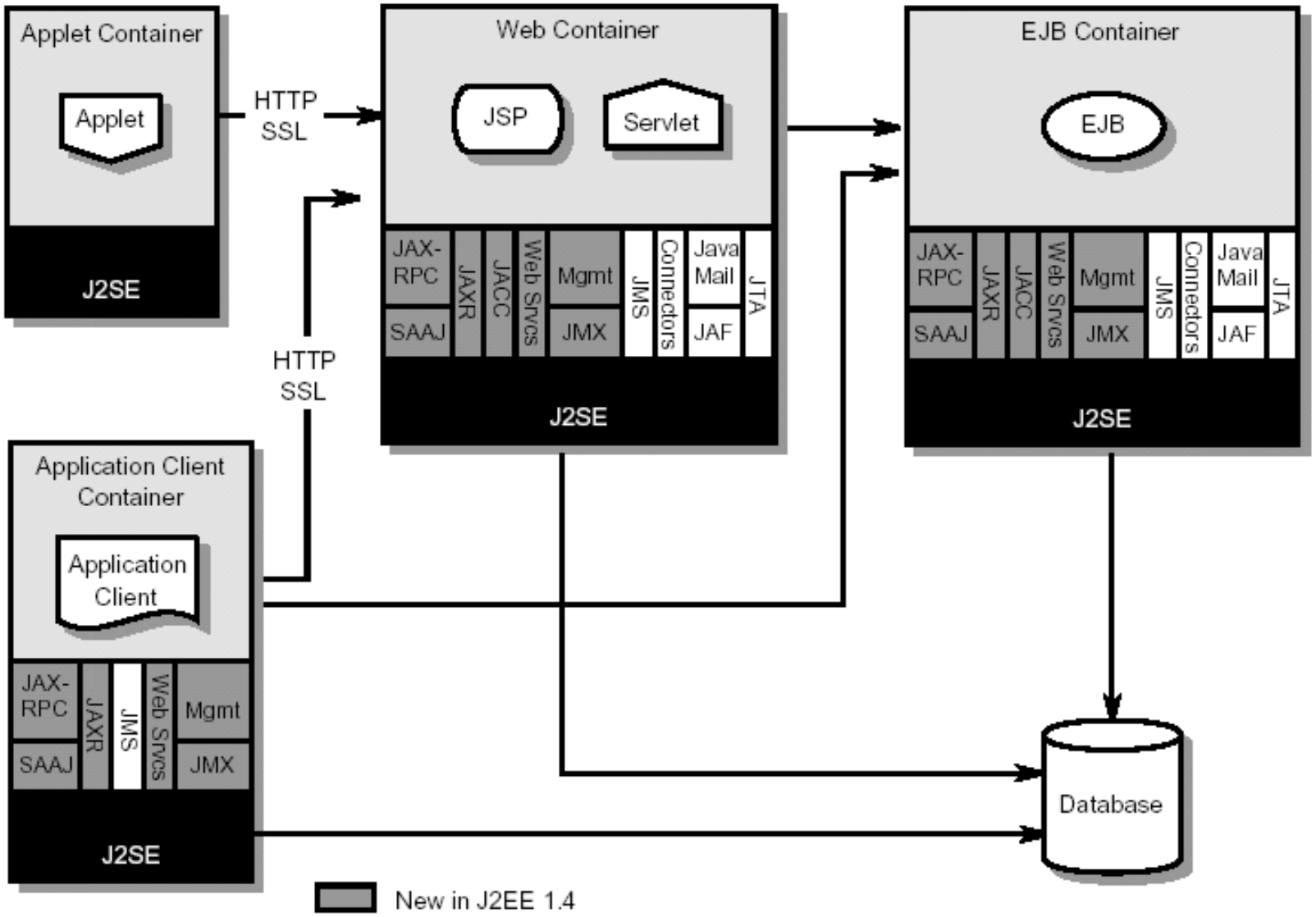


What is J2EE?

J2EE Consists of four parts:

- Platform Specification
  - Defines J2EE requirements
- Reference Implementation
  - Operational J2EE platform
- Compatibility Test Suit
  - Validates J2EE platform compatibility
- J2EE Blueprints
  - Describes how to build (better) J2EE applications

J2EE Architecture Overview



What Is An Application Server?

- An application server is a software that provides infrastructure to support management of business logic and access to services
- The application server is frequently viewed as part of a three-tier application, consisting of a graphical user interface (GUI) server, an application (business logic) server, and a database server.

What Is Business Logic?

- The code that implements the functionality of an application.
- The rules associated with the data in a database that typically encode business policies.
- An example is automatically adding late fees for overdue items.

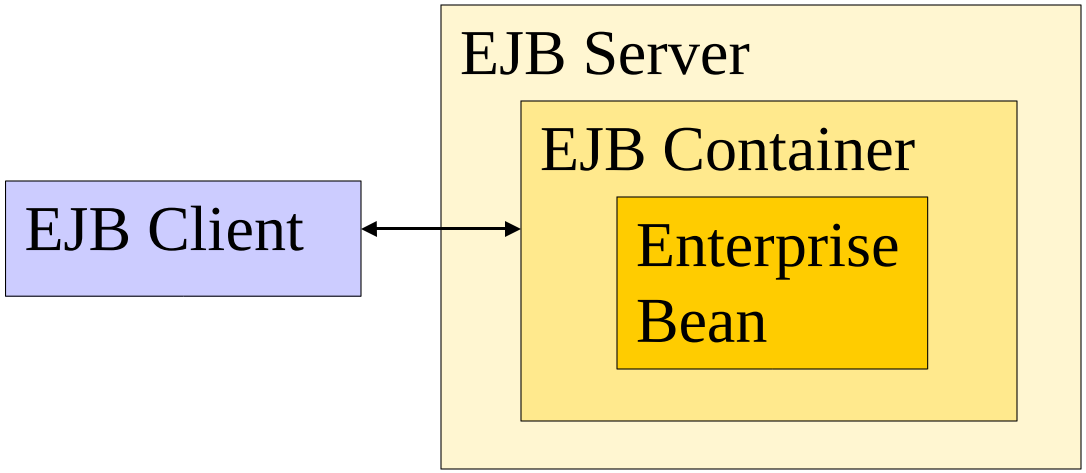
J2EE Application Server

- An J2EE application server provides a service-oriented infrastructure to automatically support and manage components
- The enterprise developer can concentrate on application components, not the underlying services
- Separation of business logic and services provide for better reuse of business logic

Enterprise JavaBeans

- Enterprise JavaBeans (EJB) is an architecture for component-based distributed computing
  - Customizable at deployment time
  - Deployed on a compatible application server
  - Portable to other application servers

- Enterprise Beans (EB) are components of distributed transaction-oriented enterprise applications.



EJB Developer Roles

- Bean Provider
  - Writes beans that perform business operations
- Application Assembler
  - Assemble beans together to form an application group and may also create client applications
- Deployer
  - Specifies the runtime-environment that is used by the bean provider and the application assembler in the deployment descriptor (a configuration file)
- Container Developer
  - Creates the container (Server Developer probably provides containers)
- Server Developer
  - Creates the EJB server
- System Administrator

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Questions?

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