4Th Year

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2016

Introduction

J2EE

Building Component Based Enterprise Web Applications

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J2EE

- Developers increasingly recognize the needs for:

Distributed Application

Transaction Application

Portable Application

- leverage the speed, security, and reliability of server-side technology

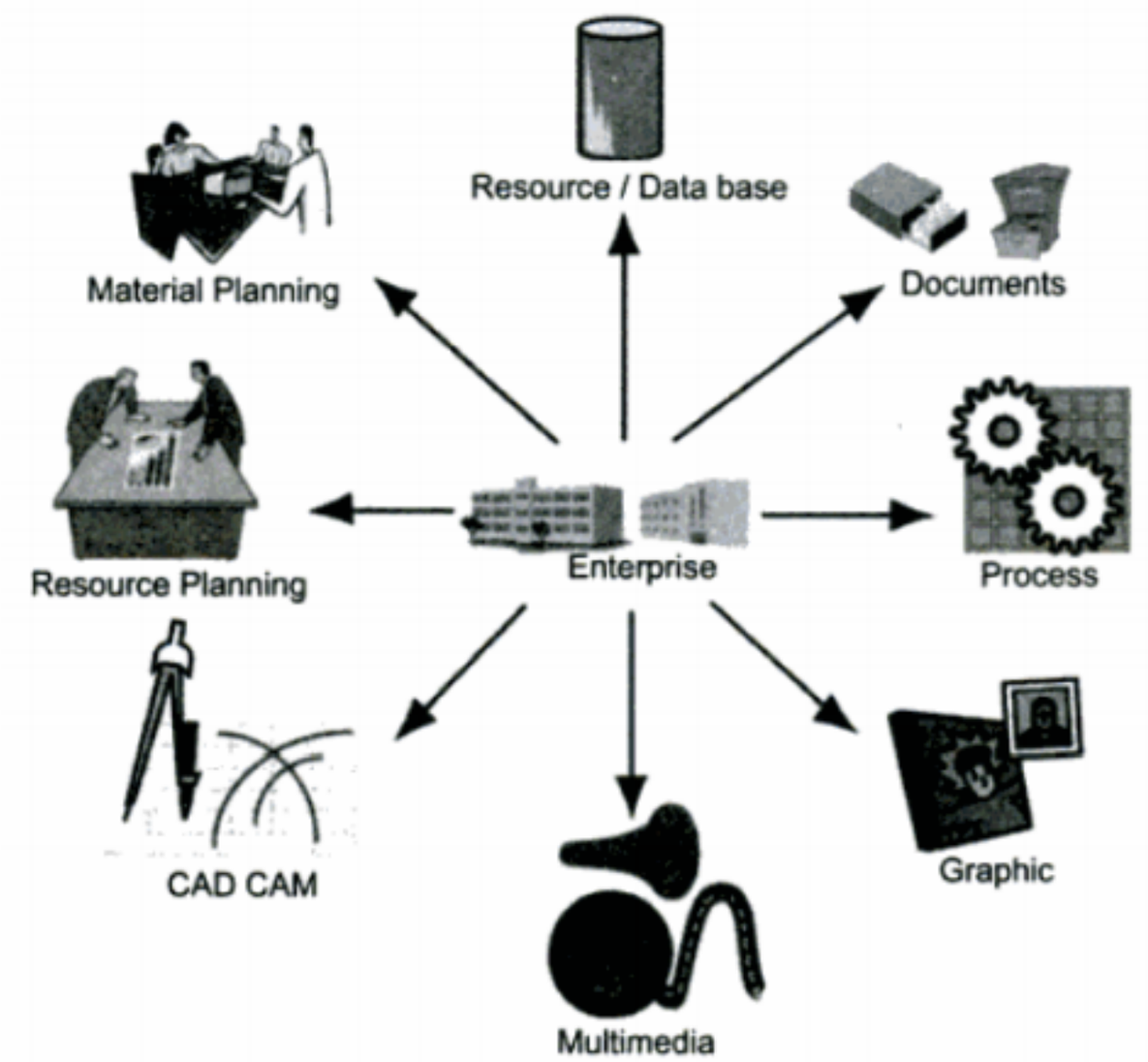
J2EE

- Enterprise applications must be designed, built, and produced for less money, with greater speed, and with fewer resource.

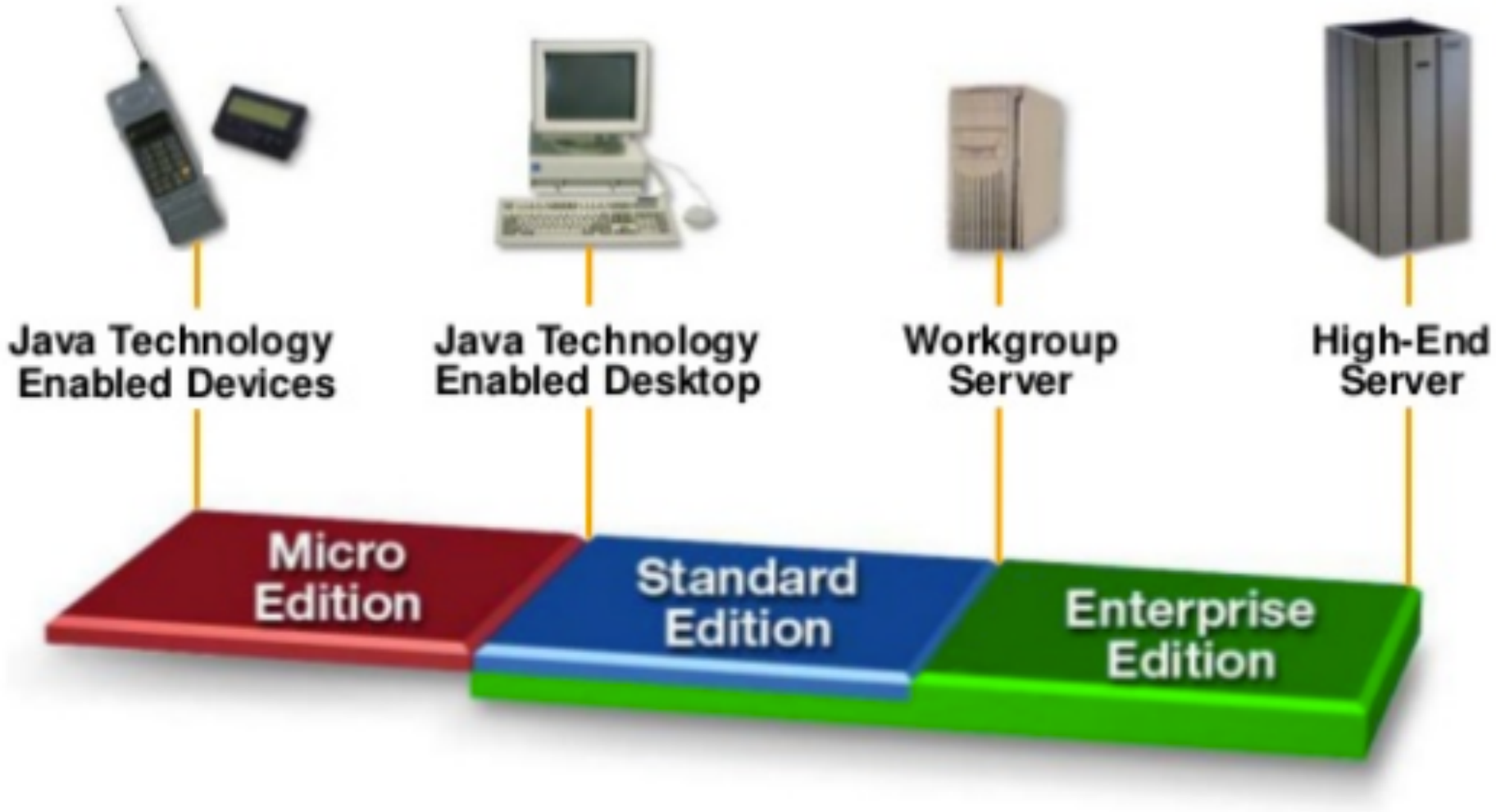
- Enterprise applications are complex, Java EE is platform provides a set of powerful APIs to reduce the development time, and application complexity.

What is An Enterprise?

Enterprises are those organizations whose business activities span over different geographical areas, deal with multiple products and/service and support a large number of transactions.



The Java Platform



Java 2 platform Enterprise Edition

- J2EE is an open, standard-based, development and deployment platform for building n-tier, web-based and server-centric, and component-based enterprise applications.

- Solves problems of two tier architecture

Java 2 platform Enterprise Edition

- **What is the problem with the two tier architecture?**

  - **Presentation, data model, business logic are intertwined (at client side), difficult for updates and maintenance**

  - **Data Model is “tightly coupled” to every client: If DB Schema changes, all clients break.**

- **DB connection for every client, thus difficult to scale.**

- **Raw data transferred to client for processing causes high network traffic.**

J2EE

- To develop n tier applications It supports the development of a variety of application types:

  - Small Client - Server Systems

  - Systems running on Intranets.

  - Systems on large scale internet e-commerce sites.

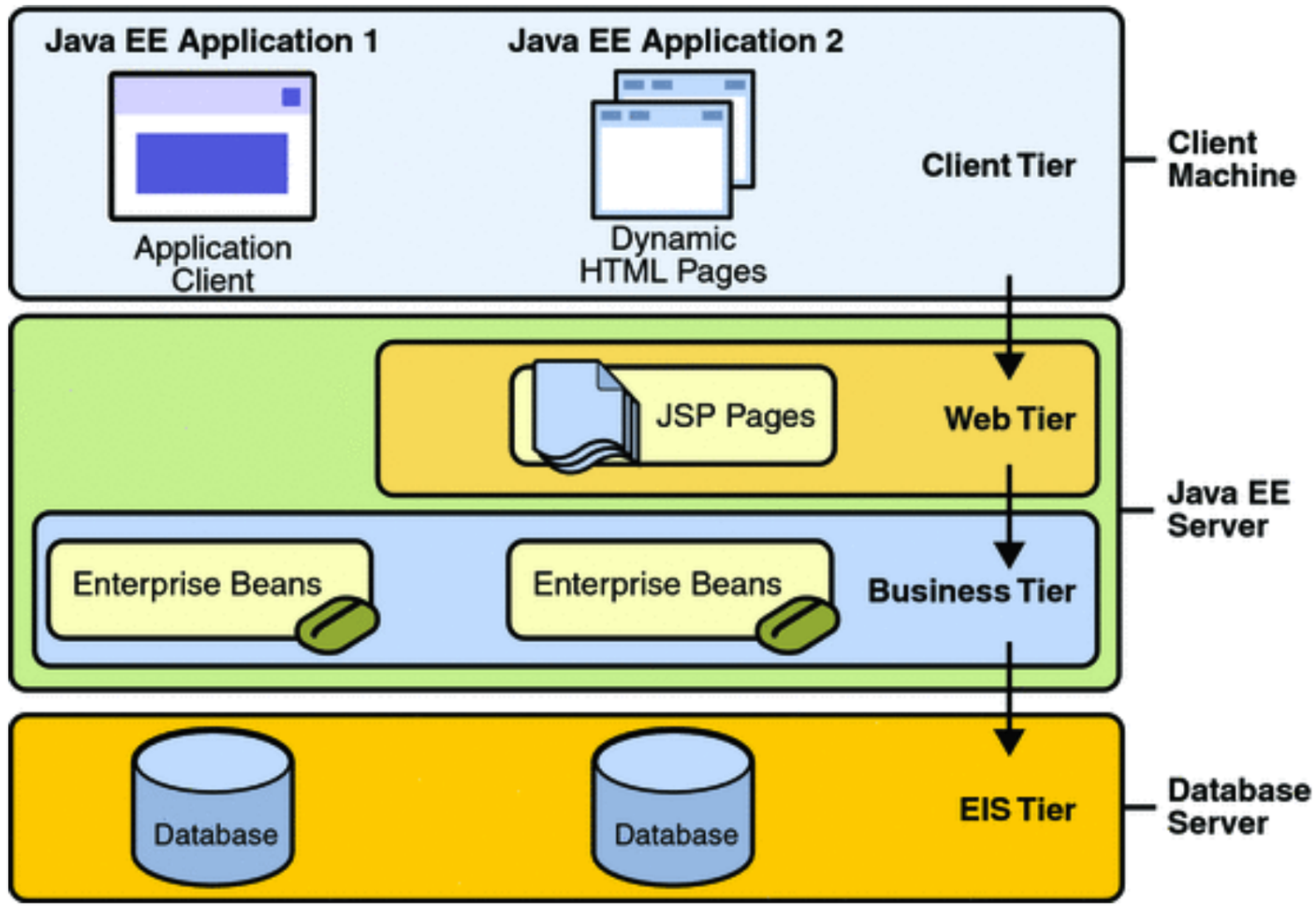
J2EE Features

- Component based model.
- Container provided services.
- Simplified architecture.
- Flexible security model.
- Separation of business logic from the presentation logic:
  - Presentation logic: display
  - Business logic: What the company want to do

Distributed Multitiered Applications

- The Java 2 EE platform uses a distributed multitiered application model for enterprise applications

- Application logic is divided into components according to function



Thin-client Multi-tiered Architecture

- **Client Tier**

  - A Java EE client can be a web client or an application client.

  Web Client:

  - A web client consists of two parts:

    - Dynamic web pages containing various types of markup language (HTML, XML, and so on), which are generated by web components running in the web tier.

    - A web browser, which renders the pages received from the server.

Thin-client Multi-tiered Architecture

- **Presentation Logic**
  - Servlets or Java Server Pages running in web server

- **Application Logic**
  - Enterprise JavaBeans running in Server

Container Services

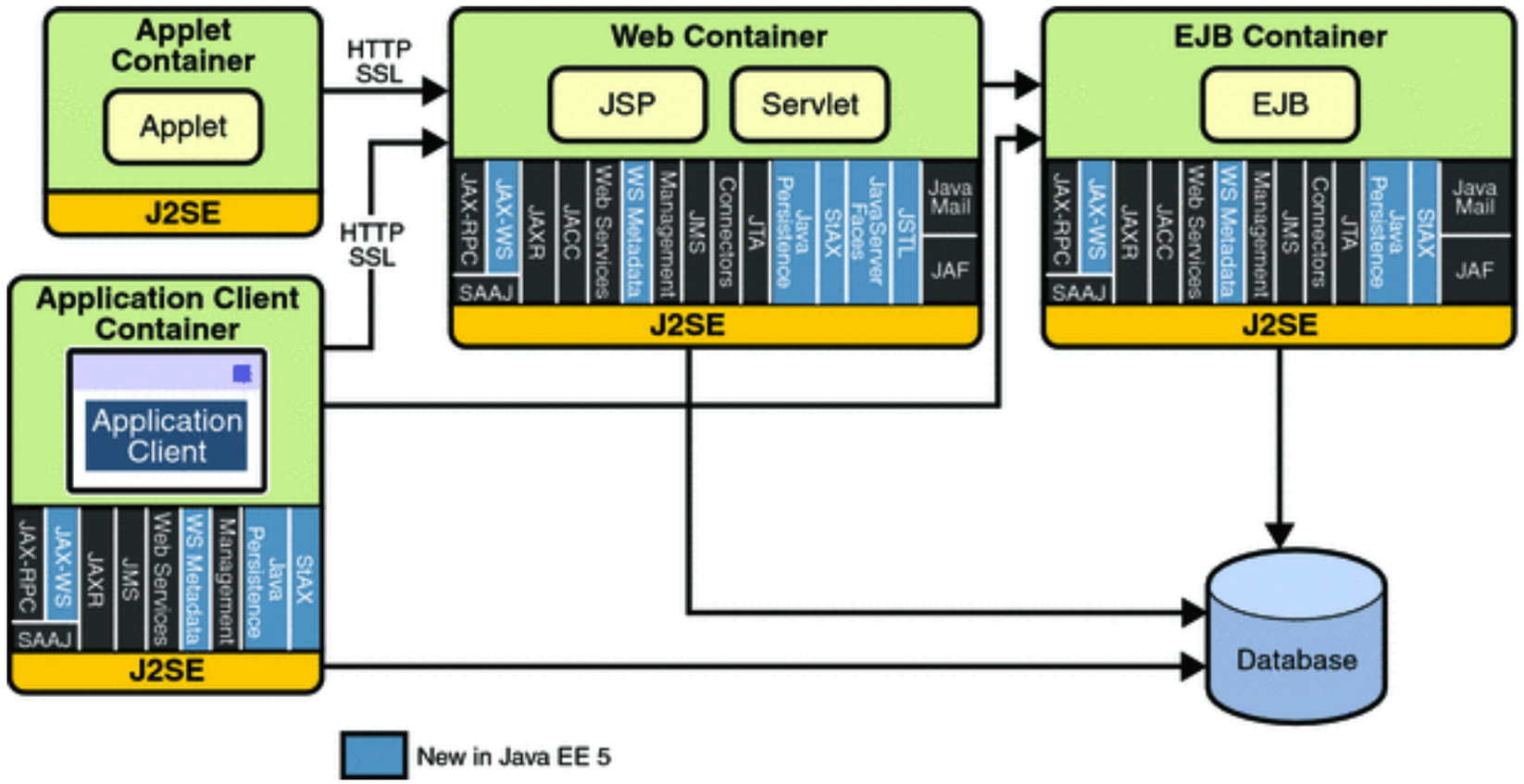
- Containers are the interface between a component and the low-level platform specific functionality that supports the component.

- Before a web, enterprise bean, or application client component can be executed, it must be assembled into a Java EE module and deployed into its container .

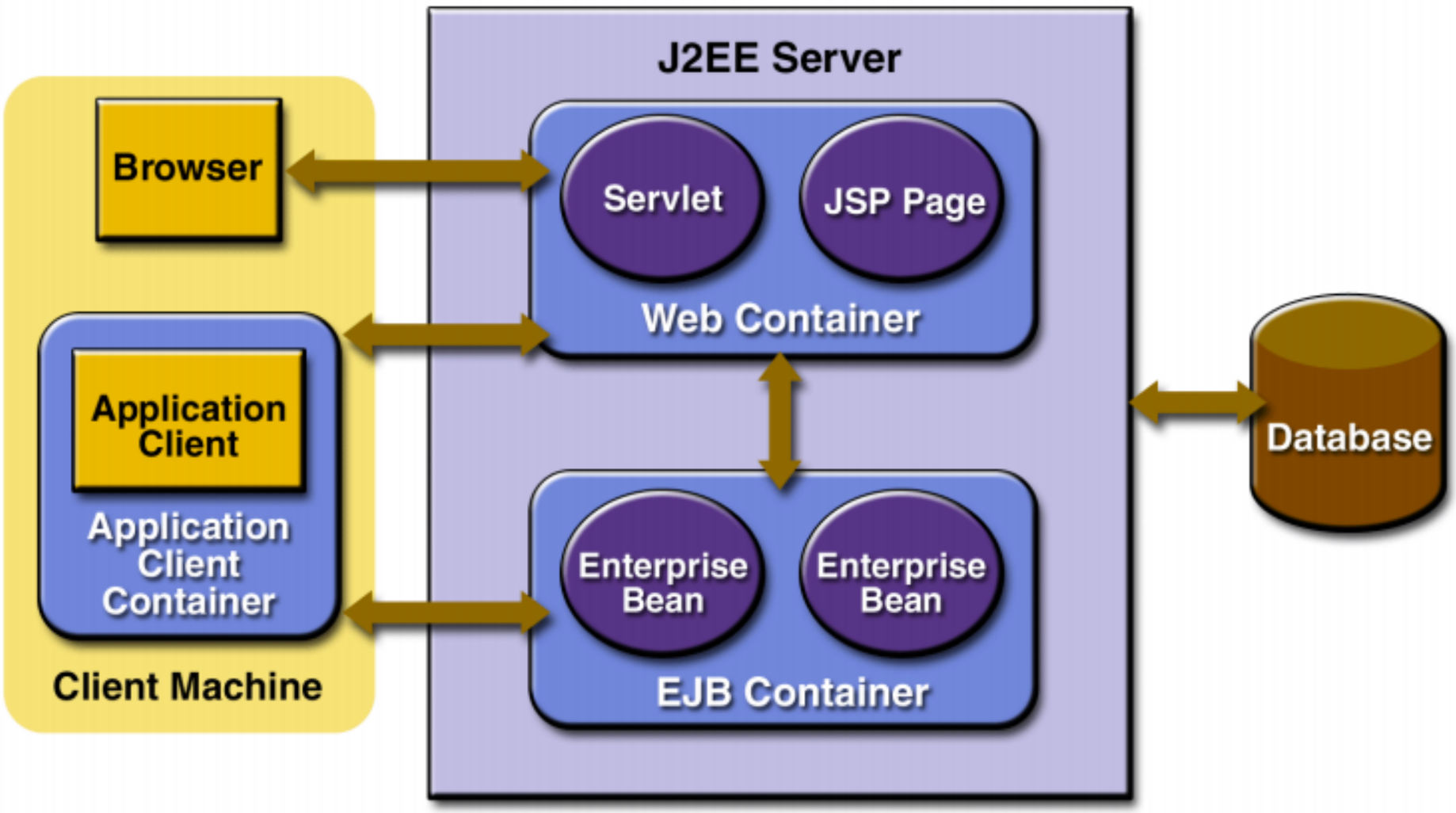
Container Services

- Component run within Container

- Container provides Real-time environment.



4-Tier Model


J2EE Server
Browser
Servlet
JSP Page
Web Container
Application Client
Application Client Container
Client Machine
Enterprise Bean
Enterprise Bean
EJB Container
Database

Advantages of Multi-Tiers

- **Tiers separate functionality:**
  - **Presentation Logic, Business Logic, Data Schema**
- Easier upgrade since one tier can be changed without changing the rest
- Lower deployment and maintenance cost.
- More flexible (can support changes), more extensible (can add functionality)

Application Server

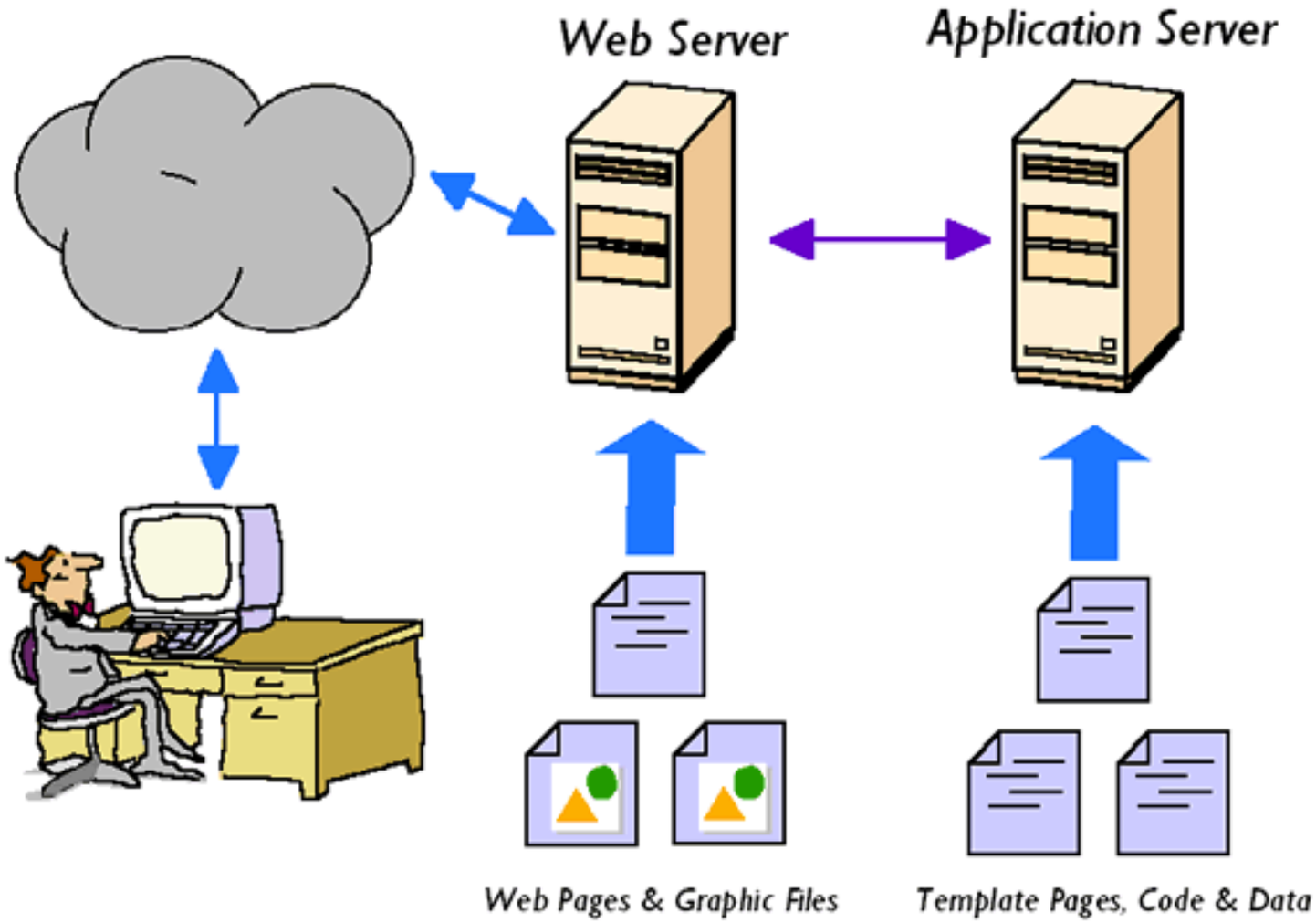
- “Multi-tier applications” have several independent components

- An application server provides the infrastructure and services to run such applications

- Application servers enable the development of multi-tiered distributed applications. They are also called“middleware”

Application Server

- An application server acts as the interface between the database(s), the web servers and the client browsers



Application Server

- **Application server products can be separated into 3 categories:**

  - J2EE-based solutions
  - Non-J2EE solutions (PHP, ColdFusion, Perl, etc.)
  - And the Microsoft solution (ASP/COM and now
  - .NET with ASP.NET, VB.NET, C#, etc.)

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