J2EE Introduction
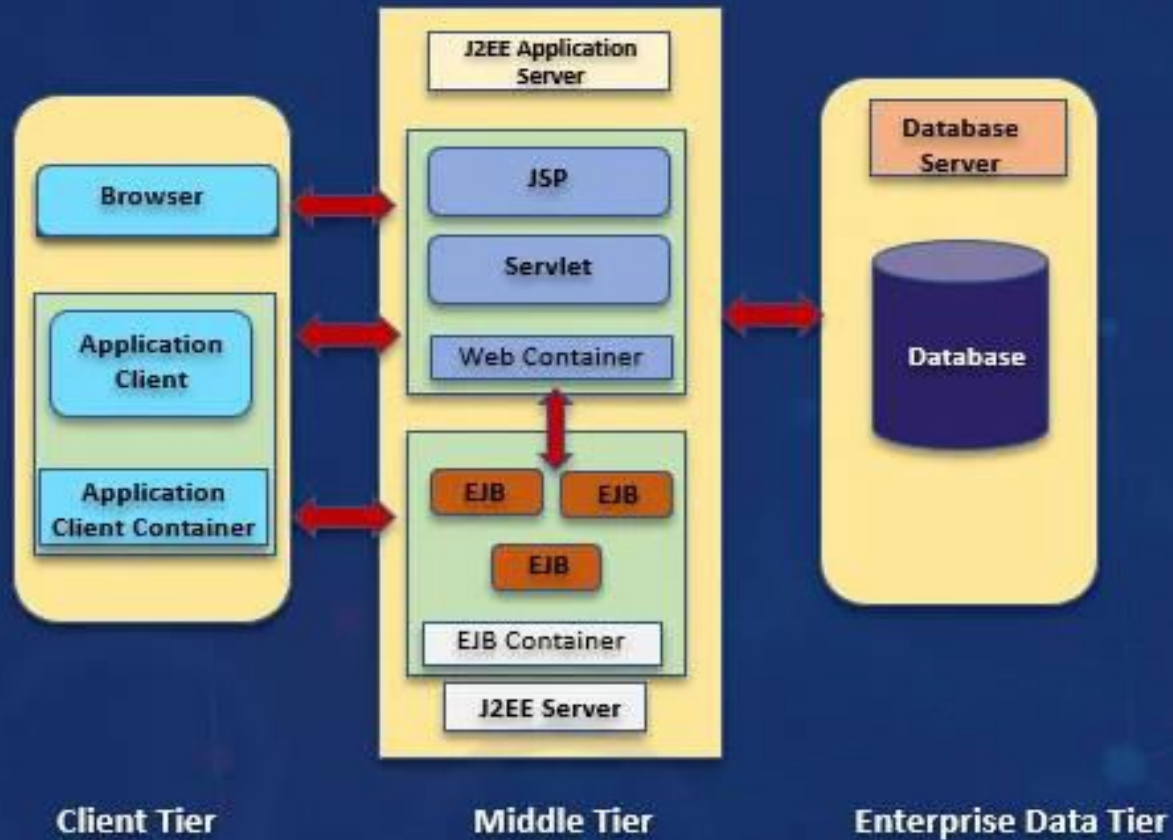
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J2EE architecture

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- *J2EE Uses Three Tiers:*

- **Client Tier**: Client tier consists of user programs that interact with the user for request and response.

- **Middle Tier:** Middle tier usually contains enterprise beans and web services that distribute business logic for the applications.

- **Enterprise Data Tier**: Enterprise data is stored in a relational database. this tier contains containers, components and services.

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2. **Middle Tier (Web tier & EJB Tier)** Below are the components of Middle Tier: **Web Tier /Web Component**

- Web components can be servlets or JSP pages. <u>Servlets can dynamically</u> process the request and generate the responses. Compared to <u>JSP and servlets</u> – servlets are dynamic pages to some extent, but JSP pages are static in nature.

- During application assembly process Client's Static HTML programs and applet, codes are bundled in web tier/ Web Component. Actually, these HTML and applets are not considered as elements of web components. Server-side utility classes are also bundled with web component, but they are not considered as web components.

- Web tier might include EJB components for processing user inputs and sends the input to Enterprise bean running in the business tier.

- **EJB Tier /EJB Component**

- Enterprise components handle usually business code that is logic to solve business domains such as banking or finance are handled by enterprise bean running in the business tier.

- Enterprise Container receives data from client processes, if necessary, sends it to the enterprise information system for storage. Enterprise bean also retrieves data from storage, processes it and sends it back to the client.

- **Three kinds of beans:**

  - **Session Bean:** Session bean is used for a conversation with the client. Once the client finishes the execution session bean destroys.

  - **Entity Bean**: Holds the data stored in a database. Once the server shutdowns or client finishes its execution entity bean data is preserved.

  - **Message Driven Bean:** Message bean combines the properties of Session Bean and JMS. Which benefits the business component to receive messages asynchronously.

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- **Containers in J2EE Architecture**

- Given below are containers in J2EE Architecture:

1. **Application Client Container**

- The container includes a set of classes, libraries, other files that are required to execute client programs in their own JVM. Manages the execution of client components. It also provides services that enable java client program to execute. This container is specific to the EJB container. Compared to other containers in J2EE this container is lightweight.

- **Features:**

  - **Security:** responsible for collecting authentication Data such as Username and Password and sends data over

    RMI/IIOP to the server. The server then processes the data using the JAAS module. Even though authentication

    techniques are provided by the client container, but these are not under the control of the application client.

  - **Naming**: Allows the application clients to use Java Naming and Directory Interface (JNDI).

2. **Web Container**

- Web Container is a component of the web server that interacts with Java servlets. A web container is responsible for managing the servlet lifecycle and mapping URLs. Web container handles a request from Servlets and JSP files and other files that includes server-side code.

- Web container implements a web component contract of the J2EE architecture. This provides a runtime environment for additional web components security, transaction, deployment, etc.

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3. **EJB Container**

- Enterprise Java bean container consists of server components that contain business logic. Provides local and remote access to enterprise beans. EJB container is responsible for creating enterprise bean, binding enterprise bean to the naming services.

- More than one module can be installed within a single EJB container. It performs transactional actions like – Start Transaction, Commits or Rollback transaction, manages various connection pools for database resources, synchronizing bean instance variables with corresponding data items that are stored in the database.

4. **Applet Container**

- The container where the client's Applet programs will run may be in a web browser or other application programs that support applet programing. Applets are subject to more restrictions due to the sandbox security model this limits access to the client machine. These are normal web pages downloaded from the web servers and executes on the client browser.

Conclusion …

- J2EE Three Tier Architecture which composed of three tiers logical computing. This helps in developing specific client-server-based applications. It also helps in development by separating the User Interface, business logic, and data storage layer. Gives greater flexibility for development for updating specific parts of the application without affecting the rest of the parts. This flexibility can improve overall development and upgrading and replacing data from a specific tier without affecting the whole system.