# J2EE Tutorial for Java Aspirants

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Developers may access enterprise features like web services and distributed computing with the Java EE platform. Leverage this J2EE tutorial to understand the fundamentals of J2EE and become skilled in application development with Java.

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## Introduction to J2EE

Java EE programs are typically executed on application servers or microservers with reference run times. Applications for Java EE include banking information systems, accounting, and e-commerce. In this J2EE tutorial, you will learn the following:

- Overview of J2EE
- J2EE Configuration
- Components of J2EE
- J2EE Containers
- Advantages of J2EE

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## Overview of J2EE

Many specifications included in Java EE help create web pages, transactional database reading and writing, and distributed queue management.

## Specifications of J2EE

Servlets, Java Server Pages, connectors, Enterprise JavaBeans, and various web service technologies are among the Java EE APIs that offer many of the features of the underlying Java SE APIs.

### Web Specifications of J2EE

- **Servlet:** The synchronous and asynchronous techniques for responding to HTTP requests are described in this specification. It depends on other criteria and is low level.
- **WebSocket:** A set of APIs that facilitate WebSocket connections are provided by this API. A protocol for computer communication is called WebSocket.
- **Java Server Faces:** It is a service that aids in constructing a graphical user interface (GUI) from components.
- **Unified Expression Language:** It is a straightforward language created to help web application developers.

### Web Service Specifications of J2EE

- **Java API for RESTful Web Services:** It helps in delivering services having a representational state transfer schema.
- **Java API for JSON Processing:** A collection of specifications called the Java API for JSON Processing is used to manage data that is presented in the JSON format.
- **Java API for JSON Binding:** A set of specifications called the Java API for JSON binding allows for the parsing or binding of JSON files into Java classes.
- **Java Architecture for XML Binding:** XML binding is supported by Java Architecture, which enables XML binding into Java objects.
- **Java API for XML Web Services:** An XML-based protocol called SOAP is used by the Java API for XML web services to access online services via


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## Enterprise Specifications of Java EE

- **Contexts and Dependency Injection:** It offers a Swing-like container for injecting dependencies.
- **Businesses JavaBean:** An object container uses this collection of simple APIs to offer concurrency control, transactions, and remote procedure calls.
- **Java Persistence API:** It describes the object-relational mapping that takes place between Java classes and relational database tables.
- **Java Transaction API:** It is made up of interfaces and annotations that facilitate communication between the Java EE transaction support services. Both the interfaces and the APIs are regarded as low-level in this abstraction of low-level details.
- **Java Message Service:** It offers a standard method for Java programs to compose, deliver, and receive messages from business messaging systems.

## Other Specifications of Java EE

- **Validation:** With a range of interfaces and annotations contained in this package, the Bean Validation API offers declarative validation capabilities.
- **Batch applications:** They offer a way to carry out background processes that take a long time and require a lot of data to be done regularly.
- **J2EE Connector Architecture:** It is a Java-based technological method for connecting Java servers with enterprise information systems.

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## J2EE Configuration

**System Requirements:**

- **RAM:** 1GB
- **Disk Space:** 250MB
- **JVM:** Java SE 6 JVM & JDK
- **IDE:** Eclipse

## Installing JDK

Here is the guide to installing Java Development Kit:

**Step 1:** Go to the Java SE Development Kit download page for Oracle.

**Step 2:** Read the licensing in the Java SE Development Kit 9.0.1 section, then click Accept Licensing Agreement if you agree.

**Step 3:** Select JDK-9.0.1_windows-x64_bin.exe (or the appropriate file for your operating system) from that section.

**Step 4:** Use Run As Administrator to launch the JDK installer after downloading it.

**Step 5:** Include the environment variable JAVA_HOME for Windows (or Linux). Place it in the newly installed JDK's root folder, which is typically C:\Program Files\Java\jdk1.8.0_51.

## Installing Eclipse for J2EE

**Step 1:** Go to Eclipse Downloads.

**Step 2:** Under "Get Eclipse," select the "Download" option.

**Step 3:** Click the "Download" button on the page that appears.

**Step 4:** Use Run as Administrator to launch the installation that you downloaded.

**Step 5:** Select the Eclipse version that you want to set up. For Java development, the Eclipse IDE is recommended for Java EE developers.

**Step 5:** Try again after temporarily disabling real-time virus scanning if the installation fails. After it's finished, don't forget to switch it on again.

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## Components of J2EE

J2EE applications are composed of components. A self-contained, fully functional software item known as an element in J2EE is assembled directly into the J2EE application using relevant files and classes.

Interacting with several other components is one of the most important roles of J2EE components. J2EE components are further defined in the following way by the J2EE specification:

- **Primary Components:** Applications and applets are the two main components that operate on clients.
- **Technology Components:** The server-side technology components that are the standard web components are JavaServer Pages and Java Servlets.
- **Business Components:** The business components of J2EE that remain active at the heart of the server are the Enterprise JavaBeans and EJB.

While J2EE components are written in Java, they are compiled in a manner akin to that of any computer language application. Furthermore, ordinary Java classes and J2EE components differ in a slight but noticeable way.

## Primary Components

- **J2EE Clients:** A J2EE client may be a web client or an application client.
- **Web Clients:** Web clients typically have two

unique components. Several markup languages, including HTML and XML, are used in web pages.

- **Applets:** These are the webpages with embedded applets that are obtained from J2EE's web tier.
    - Java programming was used to create the small client application known as the applet.
    - The Java virtual machine installed in the web browser is run by it.
    - It is likely that for the applet to properly launch a web browser on client systems, a security policy file and the Java plug-in will be needed.
- **Application Clients:** On the client's computer, the J2EE platform's application client is executed.
    - It gives users a mechanism to manage and supervise tasks that require a robust user interface.
    - The user interface (UI) can compensate for the application client with the aid of markup language.
    - GUI is also possessed by application clients; it is mainly composed of Swing or Abstract Window Toolkit APIs.

## Technology Components

- **Java Beans:** Java Beans were introduced as a crucial component of developing graphical user interfaces.
    - By adhering to a customary procedure, the curators were able to select a special panel that allowed them to easily alter the bean's characteristics.
    - Bean properties, such as text size, width, and height, represent general control over the screen.
- **J2EE Server Communications:** Clients and a business tier that is hosted on the J2EE server frequently exchange messages back and forth.
    - There may be instances where the

communication is direct or indirect.
    - In certain situations, clients can reject servlets or JSP pages that operate in the web tier in favor of using a browser.
- **Web Components:** JSP pages or servlets are two possible types of web components in Java 2E.
    - The Java programming language classes called Servlets are responsible for handling both constructs and request answers.
    - **JSP:** They are text-based documents that use servlets and offer a very natural method for producing consistent and reliable content.
    - **Applets and static:** When an application is being assembled, it is common to find HTML pages mixed with Web components.

## Business Components

They approach or resolve issues in any commercial industry, such as retail, banking, or finance, more like logic. Enterprise beans manage the business tier and are in charge of business components.

There are three types of enterprise beans:

- **Entity Beans:** They stand for the robust data stored in a database table's single row.
- **Session Beans:** They stand for the quick discussions that are frequently had with clients. The moment a client completes processing the entire session bean, the data instantly disappears. Entity beans are very different from session beans.
- **Message-driven Beans:** Message-driven beans combine the best aspects of session beans and Java Message Service, or JMS. Moreover, it enables enterprises to obtain JMS messages that are consistently synchronized.

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## J2EE Containers

Writing J2EE applications is made easier by the platform-independent and component-based J2EE design, which divides logic into exponentially reusable components.

*Writing a multilayer thin-client application is usually challenging since it requires writing complex code that spans multiple lines to handle transactions, multithreading, state management, pooling of resources, and intricate levels of detail.*

Furthermore, J2EE server Regarding containers, J2EE servers also offer a wide range of functions for the component type.

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## Types of J2EE Containers

Here are the various types of J2EE containers:

- **Enterprise JavaBeans Container:** The Enterprise JavaBeans Container is responsible for overseeing the overall operation of all J2EE applications' enterprise beans. A J2EE server is used to run EJB and its container.
- **Web Container:** It controls the JSP page's execution in conjunction with the J2EE applications' servlet components. A J2EE server powers both of the web components and their container.
- **Applet Container:** It is in charge of overseeing how applets are executed. It consists of a web browser that executes clients in tandem with the Java plug-in.
- **Application Client Container:** It oversees the implementation of J2EE's application client components. On the client, both application and container clients are executed.

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# Advantages of J2EE

The following are some of the main advantages of implementing J2EE for application development with the Java programming language:

- It provides cross-platform support, which is a beneficial feature for any kind of business.
- Similar to how Java-based technologies are assembled, open-source libraries are easily accessible to developers of all skill levels.
- Managing the large enterprise-level application to swiftly deploy server-side is possible using J2EE.
- J2EE takes pleasure in upholding and fully covering the W3C standard at the same time.

## Conclusion

J2EE architecture is still well-known. We hope that this J2EE tutorial will help you grasp the core concepts. Join our **J2EE training in Chennai** to learn this framework with hands-on exposure.



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