

**Developing Java™ 2 Platform, Enterprise Edition (J2EE™)
Compatible Applications**
Roles-based Training for Rapid Implementation

By the Sun Educational Services Java Technology Team
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Introduction

Building a distributed network based on the Java™ 2 Platform, Enterprise Edition (J2EE™) standard requires highly skilled IT professionals who can architect, build, manage and evolve the enterprise network to accommodate rapidly changing business needs. [Sun Educational Services](#) offers roles-based J2EE technology training that can help you and your team quickly develop the skills needed to successfully implement the J2EE platform in your environment.

Get Specific J2EE™ Technology Skills With Roles-based Training From Sun Educational Services

Several job roles and skill sets are needed to implement J2EE technology in an enterprise. Sun Educational Services offers courseware designed to meet the specific needs of different roles, such as Web component developers and business component developers. This article discusses the J2EE architecture and technologies you're familiar with in the context of job roles that use J2EE technology, and introduces some of the specific J2EE training available from Sun Educational Services.

Building J2EE Technology-Compatible Applications Is Key

One of the primary advantages of J2EE technology is application portability. To build portable applications based on J2EE technology ("J2EE applications"), developers need to write application components to the J2EE specification and test them to verify compliance. This process helps ensure the application will run on any J2EE technology-certified application server, regardless of platform.

Building J2EE applications benefits developers in several ways. For example, once you've mastered a few simple APIs and application configurations, you can easily apply those skills to build larger J2EE applications with greater functionality. You can "wrap and embrace" existing enterprise applications with a unified, component-based application model, eliminating the high cost of replacing existing applications. Additionally, J2EE technology manages many common functions--such as resources, transactions, security and authentication, persistence, naming and directory services, and messaging services--so you can focus on solving business problems and leave the low-level programming details to the architecture.

If you are an IT manager or technology evaluator who will be involved in moving an organization to the J2EE platform, you'd probably like to know more about what is included in the J2EE technology package, the architecture, the technologies used to build components, and the primary developer roles so you can be thinking about where you can apply your skills in the J2EE environment. These are some of the topics covered in

[Java™ 2 Platform, Enterprise Edition: Technology Overview Seminar \(SEM-SL345\)](#).

This two-day seminar provides a comprehensive overview of J2EE technology. Participants can learn about J2EE architecture and its significance in the industry, as well as about the technologies that support the J2EE framework and how to apply J2EE technology-based strategies to solve real-world business problems.

A Brief Look at the J2EE Architecture and Technologies

J2EE is more than just a Java technology platform--it is a complete enterprise development philosophy. The J2EE system includes four key deliverables:

- **Platform Specification** lists the various APIs and defines the minimum J2EE platform requirements that all compliant vendors must support.
- **Reference Implementation** is a freely available, operational J2EE application server platform for testing J2EE components in a compatible environment, for demonstrations and for developing prototypes.
- **Compatibility Test Suite** is a comprehensive set of software tests that J2EE platform vendors can use to validate that their implementations comply with the J2EE specification.
- **Blueprints** are best practice guides that simplify the development of scalable, available, J2EE technology-compatible solutions. The J2EE Blueprints release includes patterns, examples and documentation to help architects and developers create applications based on the J2EE architecture.

The J2EE standard requires you to build component-based enterprise applications. The J2EE architecture consists of three major parts:

- **Components** that hold presentation and business logic
- **Containers** that provide context for components
- **Connectors** that provide access to legacy enterprise database systems

The J2EE application logic is divided into components according to function, and you can install the different application components that make up a J2EE application on the same or different servers. Where an application is installed depends on which tier in the multi-tier J2EE environment the application component belongs to. The tiers are client tier, Web tier, business tier and enterprise information system (EIS) tier, as shown in Figure 1.

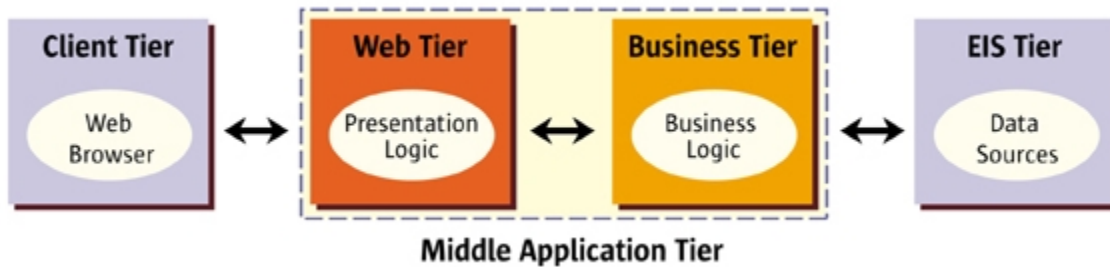


Figure 1: J2EE Architecture

Each tier has a well-specified interface and may include application components based on one or more technologies.

- **Client tier** - The client tier displays information and collects input from the end user. J2EE technology supports several types of client presentation technology, including Hypertext Markup Language (HTML) clients, applets, Extensible Markup Language (XML) documents, and Java technology-based standalone clients.
- **Web tier** - This tier generates presentation logic and accepts user input from HTML, applet, and XML clients, and generates appropriate responses for the user. You can implement this tier as Java technology-based servlets ("Java servlets") or as pages created with JavaServer Pages™ (JSP™ pages) technology on a Web server. JSP pages allow you to connect the Web to the enterprise. They also simplify development of dynamic Web pages as well as XML generation on the Web tier. XML enables platform-independent, standards-based data interchange to complement platform-independent Java technology-based applications.
- **Business tier** - This tier implements both presentation and business logic based on Enterprise JavaBeans™ (EJB™) technology. EJB architecture simplifies development by enabling developers to create business logic rather than reconstruct "plumbing." EJB architecture also allows you to make calls into other applications. Entity beans support data persistence, while session beans support server logic processing on behalf of the client. Application logic runs on an application server to enable thin clients and reusable business processing.
- **EIS tier** - This tier handles enterprise information system software, and includes enterprise infrastructure systems such as enterprise resource planning (ERP), mainframe transaction processing, database systems and other legacy information systems. This is where "wrap and embrace" comes into play, as J2EE technology can enable existing enterprise applications to access relational databases.

Architectural Considerations

There are a number of important tradeoff decisions that J2EE application architects and developers need to consider. For example, what does the application need to do? It is important to use the right technologies when architecting an application and to avoid over-designing. For example, designing an application using Enterprise JavaBeans architecture may be overkill when using JavaServer Pages and JDBC™ technology is sufficient. It is important to understand the advantages and tradeoffs of the various technologies used to build J2EE applications, as well as whether to make an application Web based or non-Web based. Making informed decisions about transaction management, security and deployment can also contribute to creating a good application design. The J2EE Blueprints showcase the best practices of J2EE application development, which can help you make informed design decisions.

Architects and senior developers who need to address J2EE technology tradeoff decisions and want a fast track for learning how to scale J2EE applications may want to take [Architecting and Designing J2EE™ Applications \(SL-425\)](#). In this course, participants can learn how to address flexibility, performance, security, and manageability issues by using a series of guidelines. They can also learn how to apply these guidelines using real-world architectures and design patterns to create J2EE applications.

Primary Developer Roles That Use J2EE Technology

The J2EE standard requires a clear separation of presentation and business logic in the application server. This model results in the need for two primary J2EE application developer roles: Web component developers and business component developers. Figure 2 shows these roles within the multi-tiered J2EE architecture.

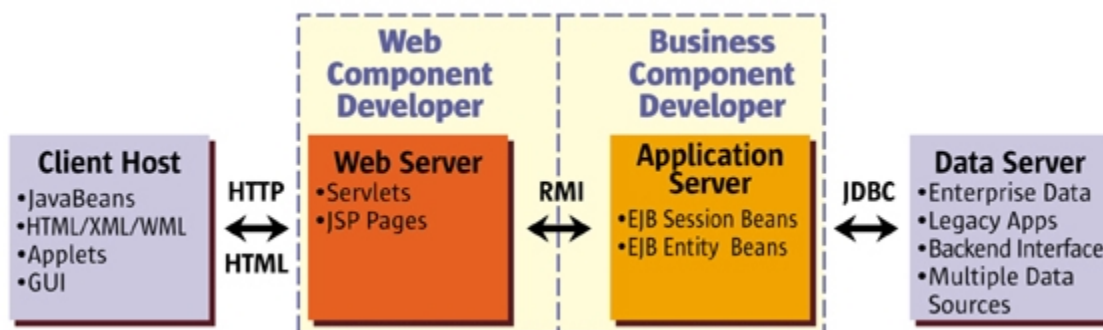


Figure 2: Developer Roles

Web Component Developers

Web component developers for the J2EE platform write applications that run on a Web server, which can be made up of JSP pages, Web-based applets and servlets that display HTML pages on a client machine. The Web component developer needs to understand JSP pages, Java servlets, Web-based applets, and Web technologies such as HTML and CGI scripts. Former Visual Basic programmers who have been trained to a [Sun Certified Developer for the Java Platform](#) level may be good candidates to specialize in this role because they are used to designing information for presentation to an end user, such as graphical user interface (GUI) systems.

Business Component Developers

Business component developers for the J2EE platform write business code to address the needs of a particular business domain, such as banking, retail or finance. A business component developer needs to be skilled in building EJB components that run on an enterprise application server. This person also needs to understand how an EJB component receives data from client programs, processes it (if necessary), and sends it to the enterprise information system tier for storage, as well as retrieving data from storage and sending it back to the client program. C++ developers who are used to building business processing logic and former COBOL/mainframe developers who understand what is required to interface with backend systems may be well suited for this role.

Sun Can Help You Build Your J2EE Application Development Skills

Sun offers training that is specifically designed for the two new developer roles. Developers in either role can benefit from taking [Developing J2EE™ Compliant Applications \(FJ-310\)](#), a new course from Sun Educational Services that provides an overview of the J2EE architecture and the essential J2EE components. You and your entire team can be up to speed on J2EE technology in one week by taking this course.

In this course, you can gain hands-on experience by designing, building, deploying and testing an end-to-end J2EE application, working through design considerations and making technology decisions along the way. In the process, you also learn more about the developer roles and can begin thinking about who would be best suited to take on particular J2EE technology roles in your organization. You can keep the code examples from class, which provide a good reference later when you begin creating J2EE applications on your own.

Upon completing this course, you should be able to:

- Create, code and test Enterprise JavaBean components that provide enterprise application logic

- Provide HTML client access to EJB components through servlets
- Create HTML clients using JavaServer Pages technology
- Access a database using JDBC or entity EJB components
- Assemble, deploy, and test a distributed Java technology application

To help developers gain expertise with J2EE technology, Sun Educational Services is creating separate curriculum for Web component developers and business component developers. Sun intends to offer certification programs for these new roles in the future.

Round Out Your Skills With Specific Technology Training

[Developing J2EE™ Compliant Applications \(FJ-310\)](#) is the first course in the Sun Enterprise Java Learning Suite. Sun offers additional development courses to help you round out your J2EE technology skill set, including:

[Beyond CGI: Programming with Java™ Servlets \(SL-310\)](#)

[JavaServer Pages™ \(SL-315\)](#)

[Enterprise JavaBeans™ Programming \(SL-351\)](#)

[Database Application Programming with Java Technology \(SL-330\)](#)

[Managing XML with Java™ Technology \(SL-385\)](#)

Start Building Your J2EE Technology Skills Today

Specific J2EE technology roles-based training from Sun Educational Services can lead to a greater knowledge base, which can result in faster delivery time to market. To learn more about how Sun Educational Services can help you or your team develop J2EE applications:

- Visit the [Sun Educational Services](#) site for course information or to register.
- Call your local Sun Educational Services representative, or call 1-800-422-8020.
- Look for the latest Java technology on the Sun [Java](#) site.