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LESSON: J2EE Overview

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Labs

Resources
Subjects

- Enterprise application development
- Multiered distributed applications
- What is J2EE?
- J2EE Application Model
- J2EE technologies

J2EE Overview 1
Challenges of Enterprise Application Development

- Programming productivity
  - standards, application models, multi-channel clients
- Response to demand
  - scalability, load-balancing, (re)configuration, deployment
- Integration with existing systems
  - standard services to access e.g. DBs
- Freedom to choose
  - avoiding vendor/product lock-in, mix/match products
- Security

J2EE Overview

To leverage Internet economics, it is imperative not only to project enterprise systems into various client channels, but to do so repeatedly and in a timely manner, with frequent updates to both information and services. The principal challenge is therefore one of keeping up with the Internet hyper-competitive pace while maintaining and leveraging the value of existing business systems.
Multitier Architectures

Evolved from 3–tier approach

- Client tier (1)
  - client presentation/interaction
- Middle tier (2)
  - business logic, may have sub tiers (e.g. web–tier)
- Backend tier (3)
  - services of existing information systems (e.g. DBs)

J2EE Overview

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What is J2EE?

Java2 Platform, Enterprise Edition (J2EE)

"Combines a number of technologies in one architecture with a comprehensive Application Programming Model and Compatibility Test Suite for building enterprise-class server-side applications." (Source: Sun)

J2EE Overview

J2EE is not a product, rather it is a specification defining a server side Java framework. Vendors are responsible for using this J2EE spec in order to make compliant J2EE Servers. This allows IT developers to write their Java Business Logic using the J2EE APIs. They do not have to worry about implementing the surrounding framework.
The J2EE platform uses a multitiered distributed application model. This means application logic is divided into components according to function, and the various application components that make up a J2EE application are installed on different machines depending on which tier in the multitiered J2EE environment the application component belongs.
## J2EE Multitier Model – Components

Application logic is divided into components according to function:

- Client tier components run on the client machine
- Web tier components run on the J2EE server
- Business tier components run on the J2EE server
- Enterprise information system (EIS) tier software runs on the EIS server

### J2EE Overview

While a J2EE application can consist of the three or four tiers, J2EE multitiered applications are generally considered to be three-tiered applications because they are distributed over three different locations: client machines, J2EE server machine, and the database or legacy machines at the back-end. Three-tiered applications that run in this way extend the standard two-tiered client and server model by placing a multithreaded application server between the client application and back-end storage.
J2EE Application Components

<table>
<thead>
<tr>
<th>Component types</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Client components: application clients, web browsers and applets</td>
</tr>
<tr>
<td>• Web components: Java Servlet and JavaServer Pages</td>
</tr>
<tr>
<td>• Business components: Enterprise JavaBeans (EJB)</td>
</tr>
</tbody>
</table>

J2EE applications are made up of components. A J2EE component is a self-contained functional software unit that is assembled into a J2EE application with its related classes and files and communicates with other components.

J2EE components are written in the Java programming language and compiled in the same way as any Java programming language program. The difference when you work with the J2EE platform, is J2EE components are assembled into a J2EE application, verified that they are well-formed and in compliance with the J2EE specification, and deployed to production where they are run and managed by the J2EE server.
# J2EE Technologies

## Main Technologies
- Enterprise JavaBeans (EJB)
- Servlets
- JavaServer Pages (JSP)

## Supporting Technologies
- Java Message Service (JMS)
- Transactions (JTS)
- J2EE Connector (legacy integration)
- CORBA
- XML
- Java Naming and Directory Interface (JNDI)

## J2EE Overview

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J2EE Application Scenarios
J2EE Advantages

- Simplified architecture and development
  ✦ component–based, labour division, dynamic assembly/deployment
- Scalability to meet demand variations
  ✦ transaction support, DB connection pooling, load–balancing
- Integration with existing information systems
  ✦ integration APIs for: DBs, mail, CORBA, messaging, directories
- Choices of servers, tools, components
  ✦ server choices, tool (IDE) support, component market place
- Flexible security model
  ✦ support a wide range of security requirements
Where to go from here

- www.javasoft.com/j2ee
  - main starting point
- developer.java.sun.com
  - Enterprise JavaBeans Technology Fundamentals
- www.javasoft.com/j2ee/tutorial
  - J2EE tutorial from Sun
- www.javasoft.com/j2ee/blueprints
  - best practice guidelines and architectural recommendations
- www.javasoft.com/j2ee/download.html
  - download and try the J2EE SDK
RESOURCES

http://www.javasoft.com/j2ee/

[ejbnow-1] Richard Monson-Haefel; EJBNowMiddleware; This site was created and is maintained by Richard Monson-Haefel the author of the books Enterprise JavaBeans, 2nd Edition and Java Message Service which are published by O'Reilly. Many of the links provided in the various sections are ones used in Monson-Haefel's own research while others are simply helpful for people new to these technologies.
http://www.ejbnow.com/

[wrox-1] Subrahmanyam Allamaraju et al.; Professional Java Server Programming J2EE Edition; This book shows how the J2EE architecture allows you, the developer, to concentrate on writing the key logic for your component. Through comprehensive coverage of the servlet, JavaServer Pages and Enterprise JavaBeans technologies, this book demonstrates how to design and construct secure and scalable Java n-tier applications.
http://www.wrox.com/Books/Book_Details.asp?sub_section=1&isbn=1861004656&subject=Java

[reilly-1] David Reilly; Introducing the Java 2 Enterprise Edition; Answers the question: "What is the Java 2 Enterprise Edition?".
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[roman-1] Ed Roman; Mastering Enterprise JavaBeans and the Java 2 Platform Enterprise Edition; Answers the question: "What is the Java 2 Enterprise Edition?".
http://www2.middleware-company.com/resources.html

[monson-1] Richard Monson-Haefel; Enterprise JavaBeans; Thoroughly enhanced for the EJB 1.1 specification, Enterprise JavaBeans, 2nd Edition provides a great introduction to the world of server-side Java components. With plenty of material on EJB architecture and design, this new edition can serve as an authoritative resource for today's bean standards.
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[javasoft-7] JavaSoft; The J2EE Tutorial; Introductory guide to developing enterprise applications on the Java 2 Platform, Enterprise Edition SDK
http://java.sun.com/j2ee/tutorial/

[javasoft-10] Nicolas Kassem et al. (JavaSoft); Java 2 Platform, Enterprise Edition Blueprints; This is an online edition of the book "Designing Enterprise Applications with the Java 2 Platform, Enterprise Edition" (Sun Java Series). It defines the application programming model for Java 2 Platform, Enterprise Edition. It provides best practices and architectural recommendations for real world application scenarios to enable developers to build portable, scalable, and robust applications for the J2EE platform. It includes the design of a complete application for an online pet-store.
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Richard G. Baldwin; *Enterprise JavaBeans: Middle-Tier Servers and J2EE*; online Java/JavaScript tutorials

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