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Sun Certification for the Enterprise Architect

Sun's most advanced certification program in Java technology is the Sun Certified Enterprise Architect (SCEA) for Java 2 Platform. This book provides information that you will need to prepare for the SCEA exam. To pass the certification exam, you should be familiar with the fundamentals of applications programming and should have some proficiency in Java programming. Additionally, you should know specific enterprise technologies. All of these topics are covered in the book's chapters and on the CD accompanying the book:

- Basic principles of enterprise architectures
- Object-oriented design using (UML)
- Two-tier, three-tier, and *n*-tier common architectures
- Legacy connectivity
- EJB and container models
- Protocols (HTTP, HTTPS, IIOP, JRMP)
- Applicability of JEE
- Design patterns
- Messaging
- Internationalization
- Security
- Enterprise architecture case study (using UML)

Eleven-plus years into its life, Java is now the mature technology most commonly used behind the strategic scenes for an enterprise. After years in which Java development seemed to be reserved primarily for Internet applications, larger firms in the corporate world are using Java as the language of choice over C and COBOL for most of their new development, including but not limited to messaging, back-end night cycle functions such as database repair and warehousing, and data capture from external data feeds.

Java's appeal lies not only in its affinity for network and distributed computing (although Intranet, Extranet, and Internet applications remain the major focus of Java development) but also in Java's other qualities, such as ease of programming and cross-platform capabilities—the "write once, run anywhere" promise.

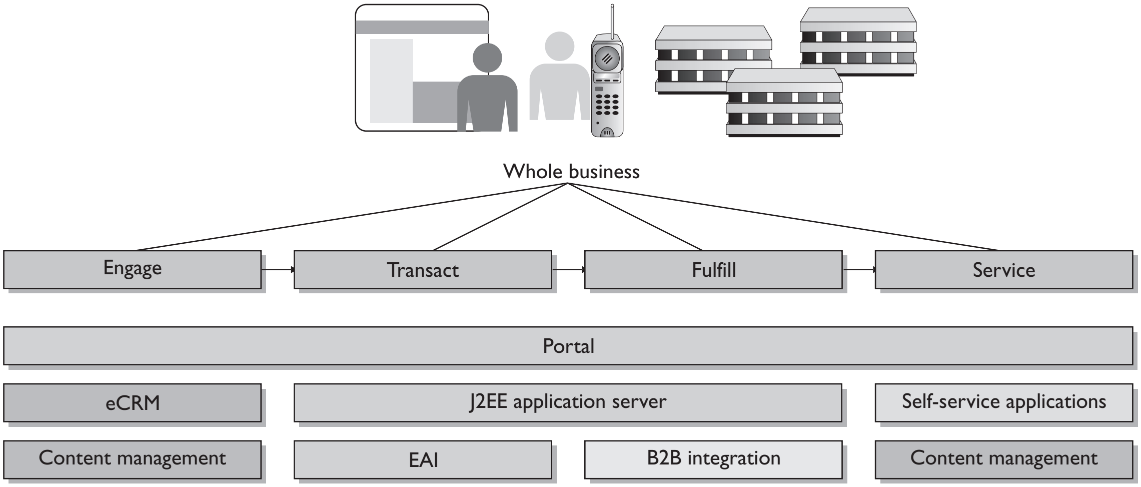
Widespread Capabilities for Application Development

A large portion of the appeal of Java is the ease with which it allows the creation of web-based, self-service applications that enable customers to do their work and perform other tasks over the Internet through a browser. Most applications are HTML on the web server front end with Java servlets on the application server back end that run on the company's web server. Figure 1-1 shows the application server hierarchy.

Java isn't just for e-business. Many organizations with large user bases are reengineering their client/server configurations because the deployment and distribution of this design is cumbersome and expensive. Some are developing Java applications for internal use, occasionally deploying Java clients to employee desktops.

Still, many issues stand in the way of Java Enterprise Edition (JEE) adoption by corporate application development groups. These include concerns about the development environment, the need to locate or train Java developers, the complexity of Enterprise JavaBeans (EJB), and the need to upgrade to the new generation of JEE application servers to take full advantage of the technology. This is where the JEE architect is most needed. The right architect can step into the enterprise to resolve these issues and make the dream of a JEE-based enterprise a reality.

FIGURE 1-1 The Java Enterprise Edition (JEE) application server is the focal point.



An undercurrent of concern also exists about what Microsoft is doing with its .NET initiative and what impact, if any, those actions will have on a development group's Java plans.

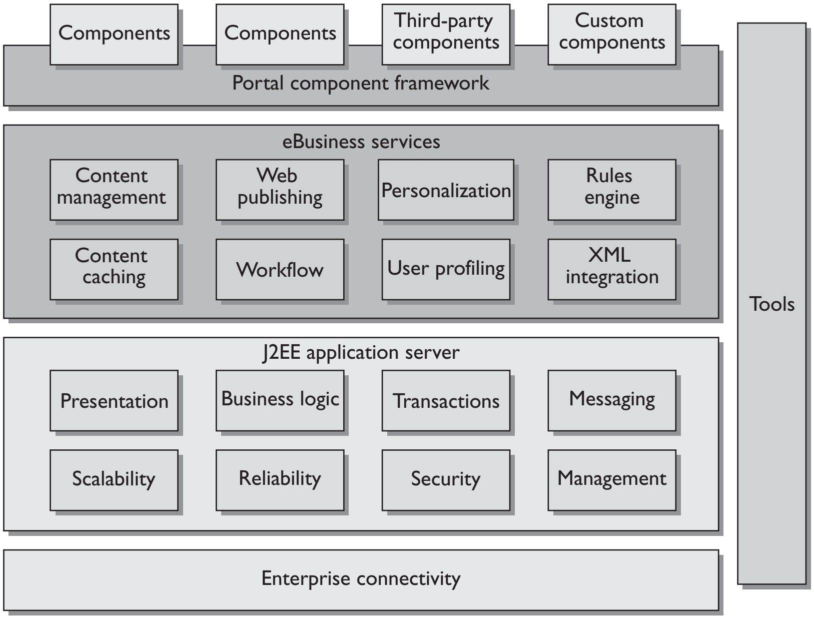
Judging from the JEE application server market, however, Java and JEE are here to stay. At the time of this writing, research leaders project the application server market that was $2 billion in 2005 will reach $6.6 billion by 2012 (see *www.researchandmarkets.com*).

Java Is the Glue That Binds the Application Development Process

JEE application servers are critical to developing and deploying scalable enterprise Java applications. Application servers provide the infrastructure to execute and maintain business-critical applications, especially e-business applications. JEE defines the programming model and provides underlying services such as security, transaction management, and messaging to enable developers to build networked Java applications quickly and deploy them effectively in the distributed world. Figure 1-2 shows the multiple functions of the JEE application server.

FIGURE 1-2

The Java Enterprise Edition (JEE) application server is multifunctional.



A rush to deploy the latest JEE application servers in the business environment is fueling growth. Perhaps 200 application servers are being offered on the market today, with more appearing weekly. However, only a few dominate the market. Three companies—BEA Systems, IBM, and Sun—each claims 20 percent or more of the market, and several other vendors who specialize in market niches claim less than 10 percent each. IBM leads the application server market with a reported 26.3 percent market share (see *www.researchandmarkets.com/reportinfo.asp?report_id=32327*). The JEE application servers that are on top are IBM WebSphere, BEA Systems WebLogic, and Sun Java System Application Server Platform Edition. More specialized players include Iona Technologies, which provides several application servers with Common Object Request Broker (CORBA) capabilities.

The application server has emerged as the focal point of the new distributed, networked corporate development. The application server acts as middleware, making the necessary back-end connections, running business logic and messaging, and managing functions such as transaction management and security. The latest application servers are adding support for wireless computing and integrated Extensible Markup Language (XML) capabilities.

You can create distributed applications without an application server, but you'll end up having to build from scratch much of the functionality the application server provides—such as database connection pooling. For example, one of our UCNY, Inc. (*www.ucny.com*) clients, uses Lotus Domino as its web server and does not use an application server. "We've already built a lot of the functionality we'd get in an application server," reasoned the application manager. Long story short, the company is now in the process of porting its applications to IBM's WebSphere JEE application server.

Companies Increasingly Need the Internet to Compete

Through the next decade most business transaction will be conducted over the Internet. To make this work on a grand scale, standards are critical. The success of JEE is important, as it ensures that the Internet is the most cost-effective medium to use for promoting the services of a business. Conducting business with a user-friendly, reliable, speedy, and attractive set of web pages supported by reliable back-end business logic will make the difference between success and failure in the enterprise business.

The entire business must be Internet-enabled. The business site must engage the customers and enable them to conduct transactions without the necessity of human interaction. Moreover, it will feed the organization's "fulfillment" engine as well as provide a place to go for post-transaction services.

Corporations will need architects to anchor development standards such as JEE to facilitate the construction of web sites. These sites will communicate the business objectives of their clients, whether they want to direct functionality to local, national, or international markets.

Roles are now more important than ever. The architect, along with other technical and graphic design personnel, must work together to ensure that the web pages not only meet the business' needs but that they also maintain a perfect balance between performance and professional graphics work. The design of each component must follow a standard such as JEE to ensure that the end product looks professional, loads faster, and effectively communicates the company's business objectives to the world.

Challenges of Application Development for the Enterprise

Timing has always been a critical factor for adopting new technologies, but the accelerated pace inherent in a virtual, information-driven business model has put even greater emphasis on response times. To leverage Internet economics, it is imperative that the architect not only projects, builds, and displays enterprise systems, but that he or she does so repeatedly and in a timely manner, with frequent updates to both information and services. Just as the SQL standard facilitated data access, widespread acceptance and inherited experience with the JEE standard will make it easier for architects to construct enterprise systems. The architect's principal challenge is one of keeping up with the Internet's hypercompetitive pace while maintaining and leveraging the value of existing business systems.

In this economic environment, timeliness is critical in gaining and maintaining a competitive edge. A number of factors can enhance or impede an organization's ability to deliver custom enterprise applications quickly and to maximize their value over their lifetime. Hopefully, architecture and ensuing development with JEE will progress quickly so that the rapid application development (RAD) ability we grew fond of in the client/server architecture model will be present for the Internet.

Increasing Programmer Productivity

The ability to develop and deploy applications is a key to success in the information economy. Applications must go quickly from prototype to production, and they must continue evolving even after they have been deployed. Productivity, therefore, is vital to responsive application development. JEE provides application development teams with a set of standard application programming interfaces (APIs)—that is, the means to access the services required by multi-tier applications and standard ways to support a variety of clients. This can contribute to both responsiveness and flexibility.

In contrast to data access that is standardized and stabilized by SQL, a destabilizing factor in Internet and other distributed computing applications is the divergence of programming models. Historically (in web terms), technologies such as Hypertext Markup Language (HTML) have provided a front-end mechanism for distributing dynamic content, while back-end systems such as transaction processors are based on IBM Customer Information Control System (CICS), Tuxedo, IBM Message Queuing (MQ), Lotus Notes, and other data access systems. These technologies present a diversity of nonstandard programming models based on proprietary architectures.

With no single standard for application models, it is difficult for architecture, development, and production teams to communicate application requirements effectively and productively. As a result, the process of architecting applications is extremely complex. What's more, the skill sets required to integrate these technologies are not organized well for an effective division of labor.

Another complicating factor in application development time is the client type. Although many applications can be distributed to web browser clients through static or dynamically generated HTML, others may need to support a specific type of client or several types of clients simultaneously (for example, WAP, or Wireless Application Protocol). The programming model should support a variety of client configurations with minimal consequence to basic application architecture or the core business logic of the application.

JEE enables development to be role oriented. Components are architected by one group, developed and assembled by another, and deployed by still another.

JEE Architecture Must Respond to Consumer Demand

Imagine a multilocation retail business trying to increase its customer base by a factor of 10. How much time and effort would be expended on remodeling storefronts, building new warehouses, and so on, to keep up? Realistically, constant rework would impact the business' ability to serve its customers.

This holds for businesses in the e-commerce arena as well. The ability to architect applications that scale easily to accommodate growth is critical to achieving the company's goals. To scale effectively, systems require mechanisms to ensure efficient management of system resources and services such as database connections and transactions. They need access to features such as automatic load balancing without any effort on the part of the application developer. Applications should be able to run on any server appropriate to anticipate client volumes and to switch server configurations easily when the need arises. JEE-compliant application servers such as WebSphere and WebLogic provide these features in the form of database pooling, server clustering, and fail-over functionality.

The Architect Must Be Able to Integrate JEE and Legacy Systems

In many enterprises, the data of value to organizations, also called "books and records," has been collected over the years by existing information systems. The investment resides in applications on those same systems. The business rules, the procedures, and Y2K code all work, perform the business functionality properly, and cost a great deal of time and money to produce. The challenge for developers of enterprise applications is how to reuse and capitalize on this value by betting on middleware, which can converse with the legacy systems.

Architects need to use the JEE standard to help application developers by providing standard ways to access middle-tier and back-end services such as database management systems and transaction monitors.

The JEE Standard Promotes Competition and Choices

RAD environments advance programmer productivity by facilitating the assembly of software components. As JEE is maturing, integrated development environments (IDEs), for example, Eclipse, are starting to increase the productivity of developers dramatically. With extensible development environments that allow developers to add open source, or purchased components, or so-called "plug-ins," the competition to enhance the development environment is great. Architects must possess the ability to mix and match solutions to come up with the optimum configuration to accommodate the task at hand. As the vendor application server shakeout continues, freedom of choice in enterprise application development should soon extend from servers to tools to components.

As vendors adhere to the JEE standard, choices among server products will give an organization the ability to select configurations tailored to its application requirements. Much like SQL, the JEE standard provides the organization the ability to move quickly and easily from one configuration to another (for example, SQL: Sybase DB converted to Oracle), as internal and external demand requires.

Access to the proper development tools for the job is another important choice. Development teams should be able to use new tools as needs arise, including tools from server vendors and third-party tool developers. What's more, each member of a development team should have access to the tools most appropriate to his or her skill set and contribution.

Finally, developers should be able to choose from a market of off-the-shelf application components to take advantage of external expertise and to enhance development productivity. JEE standardization over the coming years will advance systems development just as SQL advanced database development.

Design Goals of JEE Architecture

The web architecture required for JEE is somewhat analogous to the architecture required to run vendor-based SQL database servers. The same qualities of performance, reliability, and security must be present for web application servers to provide a host for an application. Speed is key, and the good architect must find a way to provide it. The competition will win out every time if it is able to provide faster response to the client. The user can click away to a competitor if a response is too slow on your side.

Mastering this requirement is a difficult task for the architect, because the user base can change rapidly. Not only should the architect be concerned with domestic customers and business hours, but he or she must consider the effects of globalization. JEE application servers need to be efficient and scalable. These qualities will pare down the field to those few vendors who can provide the speed to handle a local customer base with thousands of simultaneous hits.

JEE Architects Should Strive for Service Availability

Users want the application to be available 24 × 7. This is the attraction of doing business on the web, as users don't have to worry about the doors being closed after hours. Additionally, users want to be able to speak to customer service representatives without having to wait until Monday. In addition to general availability, the reliability of the application server and the application software it runs is critical. Interruption of the business cycle—downtime—is unacceptable. The business depends on the application being up and ready to serve.

JEE architects must provide reliable server configurations (clustering) as well as safe and clear fail-over procedures. JEE application server architects also must consider privacy issues. They must be able to maintain passwords and logins and to hide sensitive data. The data must be tamper-proof, and architects must be able to allow for encrypted communication for sensitive portions of the business transactions.

JEE Architecture and Connectivity to Existing Data

Having been part of the development of mainframe systems that still maintain the "books and records" of large enterprises such as Merrill Lynch, Goldman Sachs, Phillip Morris, and most of the banks located in New York, it is easy for this author to understand why most of these systems are still in operation 25 years later. They simply work, and replacing them would be deleteriously expensive.

Specialized access to enterprise resource planning and mainframe systems such as IBM's CICS will be provided in JEE through the *connector* architecture. Because each of these systems is highly complex and specialized, each requires unique tools and support to ensure utmost simplicity to application developers. As JEE evolves, enterprise beans will be able to combine the use of connector access objects and service APIs with middle-tier business logic to accomplish their business functions, as demonstrated in Figure 1-3.

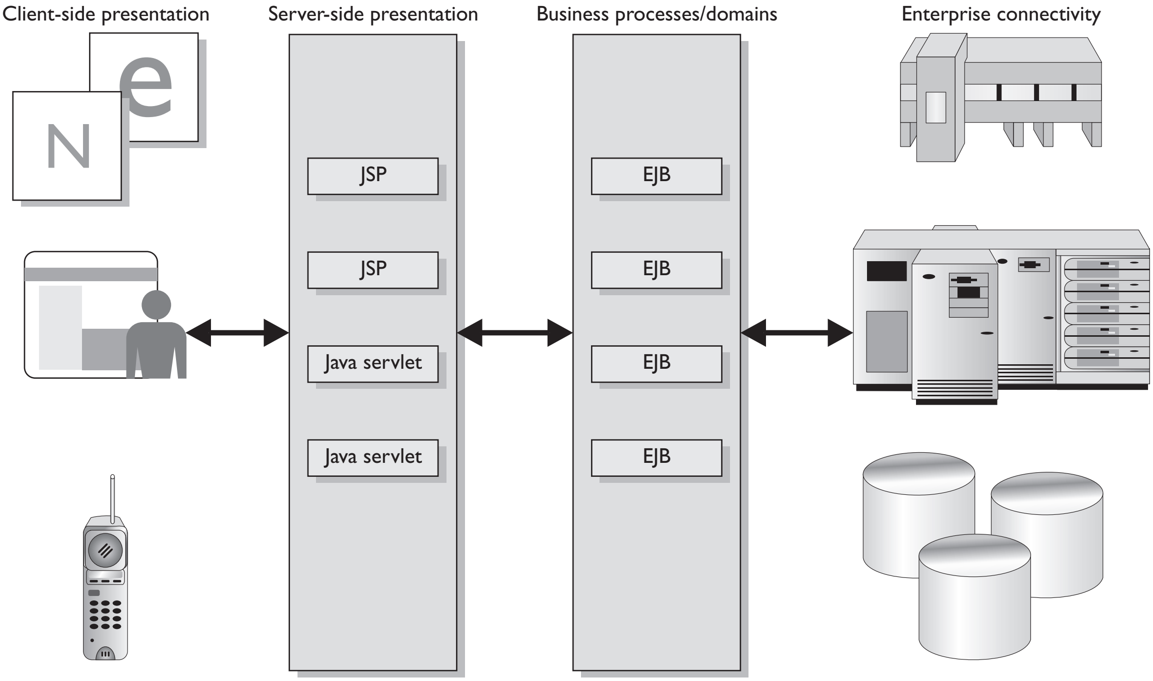
Expanded User Definition: Customers, Employees, and Partners

In the past, a desktop was the sole means of interfacing with an enterprise system, but those days are gone. Users today want to connect from virtually anywhere. The access begins during their commute and might continue through the workday and while traveling to remote business sites.

Flexible User Interaction

JEE provides choices for graphical user interfaces (GUIs) across an enterprise intranet or on the World Wide Web. Clients can use desktops, laptops, PDAs (personal digital assistants), cell phones, and other devices. Pure client-side user interfaces can use standard HTML and Java applets. Support for HTML facilitates prototypes and support for a broader range of clients. In addition, JEE supports automatic download of the Java plug-in to add applet support. JEE also supports stand-alone Java application clients.

FIGURE 1-3 Java Enterprise Edition (JEE) combines presentation, business processes, and enterprise connectivity.



For server-side deployment of dynamic content, JEE supports both the Java Servlets API and JavaServer Pages (JSP) technology. The Java Servlets API enables developers to easily implement server-side behaviors that take full advantage of the power of the rich Java API. JSP technology combines the ubiquity of HTML with the power of server-side scripting in the Java programming language. The JSP specification supports static templates, dynamic HTML generation, and custom tags.

Flexible Business Component Model

Since its introduction, the EJB technology has developed significant momentum in the middleware marketplace. It enables a simplified approach to multi-tier application development, concealing application complexity, and enabling the component developer to focus on business logic. JEE is the natural evolution of EJB technology.

EJB technology allows the developer to model the full spectrum of objects useful in the enterprise by defining three distinct types of EJB components: session beans, entity beans, and message-driven beans. Session beans represent behaviors associated with client sessions, such as a user purchase transaction on an e-commerce site. Entity beans represent collections of data, such as rows in a relational database, and encapsulate operations on the data they represent. Entity beans are intended to be persistent, surviving as long as the data with which they are associated remains viable. The message-driven bean is the coupling of Java Message Service (JMS) with EJB to create an EJB type designed to handle asynchronous JMS messages.

JEE extends the power and portability of EJB components by defining a complete infrastructure that includes standard clients and service APIs for their use.

Sun Certified Enterprise Architect Distinguishes the JAVA Professional

Because of the complexities involved, it is becoming increasingly important for IT architects to become a Sun Certified Enterprise Architect (SCEA) for the JEE technology. This is the highest certification in Sun Microsystems Java technology. With certification, you prove that you are qualified to architect JEE applications. This will obviously mean opportunities for professional advancement, such as salary increases, job role modifications, or promotions.

The SCEA for JEE exam is the ultimate test in the Sun series. The series currently includes the following certifications:

- Sun Certified Java Associate (SCJA)
- Sun Certified Java Programmer (SCJP)
- Sun Certified Business Component Developer (SCBCD)
- Sun Certified Mobile Application Developer (SCMAD)
- Sun Certified Java Programmer (SCJP)
- Sun Certified Web Component Developer (SCWCD)
- Sun Certified Java Developer (SCJD)
- Sun Certified Enterprise Architect (SCEA)

The SCEA for JEE exam tests the concepts you've gained as a professional architect. These concepts are typically gained in a career that spans ten or more years. It includes diverse languages and technology beyond Java. The exam tests your ability to produce an enterprise architecture using JEE. The SCEA certification covers the topics discussed in the following sections. The objectives tested follow each topic as bullet items. All of these objectives are covered in the chapters that follow.

Common Architectures

- Given an architecture described in terms of network layout, lists benefits and potential weaknesses associated with it.

Legacy Connectivity

- Distinguish appropriate from inappropriate techniques for providing access to a legacy system from Java technology code, given an outline description of that legacy system.

Enterprise JavaBeans

- List the required classes/interfaces that must be provided for an EJB component.
- Distinguish between stateful and stateless session beans.
- Distinguish between session and entity beans.
- Recognize appropriate uses for entity, stateful session, and stateless session beans.
- State the benefits and costs of container-managed persistence.
- State the transactional behavior in a given scenario for an enterprise bean method with a specified transactional deployment descriptor.
- Given a requirement specification detailing security and flexibility needs, identify architectures that would fulfill those requirements.
- Identify costs and benefits of using an intermediate data-access object between an entity bean and the data resource.

Enterprise JavaBeans Container Model

- State the benefits of bean pooling in an EJB container.
- State the benefits of Passivation in an EJB container.
- State the benefit of monitoring of resources in an EJB container.
- Explain how the EJB container does life cycle management and has the ability to increase scalability.

Protocols

- Given a list of some of its features, identify a protocol that is one of the following: HTTP (Hypertext Transfer Protocol), HTTPS, IIOP, or JRMP.
- Given a scenario description, distinguish appropriate from inappropriate protocols to implement that scenario.
- Select common firewall features that might interfere with the normal operation of a given protocol.

Applicability of JEE Technology

- Identify application aspects that are suited to implementation using JEE technology.
- Identify application aspects that are suited to implementation using EJB technology.
- Identify suitable JEE technologies for the implementation of specific application aspects.

Design Patterns

- Identify the most appropriate design pattern for a given scenario.
- Identify the benefits of using design patterns.
- State the name of a Gamma et al. design pattern given the UML diagram and/or a brief description of the pattern's functionality.
- Identify benefits of a specified Gamma et al. design pattern.
- Identify the Gamma et al. design pattern associated with a specified JEE technology feature.

Messaging

- Identify scenarios that are appropriate to implementation using messaging, EJB technology, or both.
- List benefits of synchronous and asynchronous messaging.
- Identify scenarios that are appropriate to implementation using messaging.
- Identify scenarios that are more appropriate to implementation using asynchronous messaging, rather than synchronous.
- Identify scenarios that are more appropriate to implementation using synchronous messaging, rather than asynchronous.

Internationalization

- State three aspects of any application that might need to be varied or customized in different deployment locales.
- List three features of the Java programming language that can be used to create an internationalizable/localizable application.

Security

- Identify security restrictions that Java 2 technology environments normally impose on applets running in a browser.
- Given an architectural system specification, identify appropriate locations for implementation of specified security features, and select suitable technologies for implementation of those features.

The SCEA exam comprises three parts: a multiple-choice exam, an architecture and design project, and an essay exam. The exam is administered by Prometric, a leading worldwide provider of comprehensive technology-based testing and assessment services (see *www.prometric.com*).

After you have successfully completed all three of the exam components, you will have earned the title of Sun Certified Enterprise Architect (SCEA) for the Java 2 Platform.

The exam components and summary details are as follows:

- **SCEA Part 1** Exam # (CX 310-051) is currently available at Prometric for $200 U.S. There are no prerequisites. The exam includes 48 multiple-choice, short answer, and drag-and-drop questions. Candidates have 75 minutes to take the exam, and the pass score is 68 percent.
- **SCEA Part 2** Exam # (CX 310-300A) is the architecture and design project, which must be completed via Sun's certification database. You must complete exam # (CX 310-051) before completing the project. There is no time limit, and the passing score is 70 percent, subject to the evaluation of the essay exam and validation of the authenticity of the assignment. The current cost is $250 U.S.
- **SCEA Part 3** Exam # (CX 310-061), an essay exam, can be completed at Prometric testing centers for a current cost of $200 U.S. To take this exam, you must have passed Parts 2 and 3. You have 90 minutes to complete four essay questions.

exam watch

***For detailed information on these exams, refer to the Certification Success Guide at** www.sun.com/training/certification/java/scea.xml.*

In addition to reading this book, you can prepare for the SCEA exam in other ways. Because of the complexity of the examination (especially Parts 2 and 3) and based upon your individual background, we recommend studying the information in a combination of books that provide detailed information covering the entire list of objectives:

- *Sun Certified Enterprise Architect for J2EE Technology Study Guide*, by Mark Cade and Simon Roberts (Prentice Hall PTR, 2002)
- *J2EE Unleashed*, by Joseph J. Bambara, Paul Allen, et al. (SAMS, 2002)
- *Mastering Enterprise JavaBeans*, by Ed Roman (John Wiley & Sons, 2001)
- *Design Patterns*, by Erich Gamma, et al. (Addison-Wesley, 1995)
- *UML Distilled*, by Martin Fowler (Addison-Wesley, 1999)
- Becoming familiar with an application server is an integral part of the preparation for the SCEA. You can use any application server, providing it is compliant with the JEE 1.2 specification. Note that when completing parts 2 and 3 of the exam, you can use concepts and UML tools that are more current that JEE 1.2.

Many quality tutorials and articles on various JEE technologies are also available. Here are a couple of them that cover the objectives of the SCEA exam:

- **JEE Tutorial** *www.java.sun.com/J2EE/tutorial/index.html*
- **TheServerSide, Your JEE Community** *www.theserverside.com*

exam watch

The current version of the SCEA exam tests your knowledge of the JEE 1.2 API. An exam upgrade to JEE 5 is expected but has not been announced. See** http://java.sun.com/javaee/ **for complete JEE API specs and related documentation.

There is nothing like learning from the experience of successful people who have been through the process of obtaining SCEA certification. You should seek out colleagues who have taken the exam and can provide insight. In addition, you can engage in discussions with members of the following use groups and at web sites:

- **SCEA_JEE** *http://tech.groups.yahoo.com/group/scea_j2ee/*

- **SCEA_PREP** *http://tech.groups.yahoo.com/group/scea_prep*
- **JavaRanch** *http://saloon.javaranch.com/cgi-bin/ubb/ultimatebb.cgi?ubb=forum&f=26*

In addition, courses are offered by Sun certified trainers; they can be helpful in preparing for the exam:

- **SUN's Coursework from the creators of SCEA exam** *www.sun.com/training/certification/java/java_certpath_ee.html*

Developing Applications for the Java EE Platform (FJ-310)
Architecting and Designing J2EE Applications (SL-425)

- **Middleware Company, a premier JEE training company** *www.middleware-company.com*

This book comes with multiple-choice and essay practice questions, plus an example case study that you need to consider to prepare for the exam. The CD contains code and additional exam questions. Even after accessing various resources, though, you may still require preparation for different reasons—clearing your doubts about a topic, understanding the latest exam pattern, and so on.

General SCEA Test Preparation Tips

To prepare for Part 1, you must understand each of the exam objectives mentioned at the beginning of the chapters that follow. Those with comprehensive experience need only concentrate on their weaknesses. Others with less experience can take anywhere from weeks to months to learn what needs to be known.

- As a whole, Part 1 may require that you spend a few hours (for an experienced architect) to six months or more of dedicated preparation (for a beginner).
- Part 2 is project work, which requires a lot of focused and concentrated effort. On average, it may require 100 hours of study, typically spread over a period of a few months.
- Part 3 is an essay exam on your work in Part 2. Your success depends on your efforts during Part 2. If you did your homework, no special preparation is required at this stage.

Let's review some test-taking tips:

- *Prepare summary notes for Part 1.* Even though you may have read everything for the exam, having a few summary pages is a good idea. You can do a quick revision of all topics before the exam.
- *Cramming doesn't work.* If you have followed a study plan, the night before Part 1, you should do a quick review and get to sleep early. Remember that your brain and body need rest to function well.
- *Approach the exam as you would approach any large task.* It might be daunting, but you can do it! A positive attitude goes a long way toward success.
- *Those tricky problems can knock you off balance.* Don't get frustrated. Reread the question to make sure you understand it, and then try to solve it. If you're still clueless, mark it and move on. You can come back to it later. What if you have no idea about the answer? Review your options and take your best shot.
- *The process of elimination can help you choose the correct answer in a multiple-choice question.* Start by crossing off the answers that are obviously incorrect. Then spend your time focusing on the potentially correct choices before selecting your answer.
- *Prepare for scenario-based questions.* The test is geared toward testing your architectural skills. Hence, many lengthy scenarios are described, followed by questions that test your knowledge on what technology may be most appropriate in the given situation and why.
- *Read each scenario question twice.* Often the real issues will be embedded within a descriptive situation, and the real question will be hidden. Concentrate on the architecture issues and try to put the scenario to the back of your mind.
- *They say a picture is worth a thousand words, so when attempting to answer scenario questions, try to diagram what is being described.* If, for example, the question is describing a legacy system communicating with an application server, it helps to draw a diagram.
- *Use scrap paper.* Before you start the test, create a grid to represent the questions and your comfort level with the answer. Even when you mark off questions for review, having this in front of you will help you estimate the time required for revision.
- *This exam tests your architectural abilities, not necessarily your coding ability, so you should focus on the concepts, not on the code.* While the test wants you to

know what code performance is, it will not give you a code snippet and ask you to optimize it.

- *Although it's not in the requirements, a sound understanding of the JEE patterns is useful in Part 1 and essential in Parts 2 and 3.*
- *Try to build up a broad knowledge of other technologies, not just JEE.* Learn about messaging, mainframe technology, and perhaps some file and database terminology, because Sun assumes you have overview of all of the technologies.

CERTIFICATION SUMMARY

The most important issue with regard to SCEA certification is how it promotes your career goals and helps you to earn a better job (and, hence, more money). With the current economy, it is somewhat difficult to compare the service rates, quantity, and quality of development opportunities. However, your opportunities will increase.

What you learn while preparing for the certification is what matters the most. The objectives for the architect certification are the best self-study curriculum for a Java architect and developer. They are practical and cover most of the issues not only with respect to Java technologies, but also with respect to computing architecture and software development. The test preparation is a forced technique for mastering the material. It pumps up your confidence as well. It helps you to organize what you know and to find the voids. It also prepares you for interviews. Many recruiting companies are using their own tests to determine the programmer's qualification. Someone with a SCEA certification is, generally speaking,

- Knowledgeable in Enterprise JavaBeans
- Knowledgeable in Uniform Modeling Language
- Knowledgeable in design patterns
- Knowledgeable in the architecture and protocols of distributed applications
- A potential project leader

The following chapters will put you in a position to take and pass all three parts of the SCEA and will provide you with a quick review for any interview or Java architect skills test. Good luck!