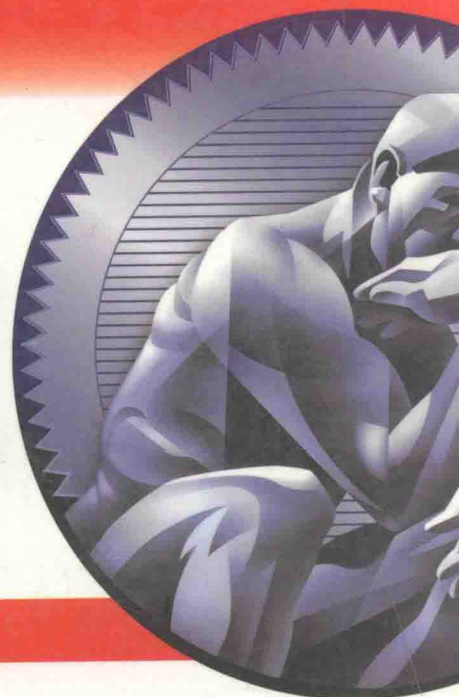


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NetBeans IDE Programmer Certified Expert

Exam Guide
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Robert Liguori
Ryan Cuprak

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NetBeans IDE Programmer Certified Expert Exam Guide (Exam 310-045)

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NetBeans IDE Programmer Certified Expert Exam Guide

(Exam 310-045)

To Patti and Ashleigh
—Robert J. Liguori

To Elsa
—Ryan Cuprak

ABOUT THE AUTHORS



Robert Liguori is a computer scientist and has been developing, maintaining, and testing air traffic management systems since 1996. He is currently providing web services assistance for air traffic management systems in support of the Federal Aviation Administration. Liguori is a software engineer with STG Technologies, Inc.

Liguori has a bachelor's degree in computer science and information technology from Richard Stockton College of New Jersey. He is a Sun Certified NetBeans IDE Specialist, Sun Certified Java Associate, and Sun Certified Java Programmer. He is currently pursuing various other certifications.

In 2008 Liguori worked closely with Edward Finegan to produce the book: *SCJA Sun Certified Java Associate Study Guide* (CX-310-019) (McGraw-Hill, 2009). The book targets preparation for the SCJA exam.

In 2007 Liguori spent his free time with his wife, Patricia Liguori, coauthoring a handy Java reference guide: *Java Pocket Guide* (O'Reilly Media Inc., 2008). The book captures Java's fundamentals in a companion-size book.

Liguori enjoys spending time with his family, as well as surf fishing for rockfish (striped bass), kingfish, bluefish, and flounder along the East Coast of the United States. He can be contacted at robert@gliesian.com.



Ryan Cuprak is an e-formulation analyst at Enginuity PLM and president of the Connecticut Java Users Group that he has run since 2003. At Enginuity PLM he is focused on developing data integrations to convert clients' data and also user interface development. Prior to joining Enginuity he worked for a startup distributed-computing company, TurboWorx, and Eastman Kodak's Molecular Imaging Systems group, now part of Carestream Health. At TurboWorx he was a Java developer and also a technical sales engineer supporting both presales and professional services. Cuprak earned a BS in computer science and biology from Loyola University Chicago. He is a Sun Certified NetBeans IDE Specialist. He can be contacted at rcuprak@acm.org.

About the Technical Editor



Brian Leonard is a principal software engineer at Oracle, where he currently focuses on Oracle Solaris technologies. Prior to joining the Solaris team, Leonard spent four years evangelizing the NetBeans IDE. During that time the NetBeans community grew from thousands to hundreds of thousands of users, and Brian falls to sleep at night assuming he played some small part in fueling that growth.

Leonard began his career working as a systems engineer with EDS at Enron, but claims no responsibility for Enron's ultimate demise. Always wanting to experience California, he moved from Houston to Silicon Valley in 1991, just in time to ride the dot-com wave. In 1997 Leonard joined the startup NetDynamics, which was pushing a new concept called an application server. In 1998 NetDynamics was acquired by Sun, and soon after, J2EE (now Java EE) was born. Leonard then spent the rest of his career working in the application server space before his boss suggested he consider joining the then left-for-dead NetBeans team. The rest, of course, is history. Leonard can be contacted at william.leonard@oracle.com.

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PREFACE

This book is designed to help you acquire the appropriate knowledge to become a NetBeans Programmer Certified Expert for the NetBeans IDE. This preparation will familiarize you with the necessary knowledge related to the many features of the NetBeans IDE that are represented on the exam. The scope of this book is to help you pass the exam. As such, objective-specific areas are detailed throughout this book. Peripheral information, which is not needed to pass the exam, may be presented in a limited fashion. Since this book covers a lot of information about the NetBeans IDE, you may also wish to use it as a general reference guide away from the certification process.

How hard is the exam? Considering that there are just 28 straightforward objectives, and you only need to get 36 of 61 questions right, you may guess that it's a walk in the park. It's not. You must have extensive experience with the IDE in all the basic areas such as desktop development, web development, database integration, versioning, configurations, testing, debugging, monitoring, profiling, and general usage of the IDE. Many people may feel that they have this experience, or that their experience with other IDEs would help them out. This is generally not the case. As an example, when asked to cite the specific means of accessing a needed dialog box for an IDE feature, you either know what menus to traverse (from usage) or you don't.

In regard to the general expertise needed with the NetBeans IDE to pursue the certification, we recommend the pursuit for the following types of candidates:

- Java SE developers familiar with the NetBeans IDE and the Swing API
- Java EE developers familiar with the NetBeans IDE and various enterprise frameworks
- NetBeans module/plugins developers
- Software programmers familiar with monitoring, profiling, and debugging tools with the NetBeans IDE
- Software testers familiar with the NetBeans IDE and the JUnit test tool
- Software architects familiar with the NetBeans IDE
- Configuration management experts familiar with the NetBeans IDE including version controls systems and IDE configuration
- High school, college, and university students wishing to get certified after taking a class on the NetBeans IDE. Note: Students may wish to discuss with their professors the adoption of this book as part of their IDE-supported curriculum.

Achieving the NetBeans IDE certification will clearly distinguish you as an expert with the IDE.

Sun Certification Program

Oracle now offers Sun certifications in a variety of technical areas supporting many of their own tools and technologies (Table 1).

In This Book

This book has been designed to present you with the NetBeans IDE information needed to complement your skill sets and expertise to get you certified. The objective-related information has been organized in a cohesive manner across the four parts of the book. This book was written with the help of various NetBeans sample projects, some open-source projects, and a few homegrown ones. Various desktop applications are used in Part I, and a primary web application (Rockfish Reports) is used in Part II. Various NetBeans sample projects are used in Part III. Part IV is reserved for peripheral information such as appendixes and the glossary.

In regard to content specifics, Part I covers NetBeans IDE desktop-related fundamentals including configurations, builds and controls, and general development against a primary desktop application. Part II covers NetBeans IDE development areas and general fundamentals including database connectivity, the source editor, refactoring, and web development. Part III covers application tools used with the IDE including the HTTP Server-Side Monitor, local and remote

TABLE 1 Sun Certification Program

Certification Tool/Technology	Certification Overview
NetBeans IDE	Single certification targeting the NetBeans Integrated Development Environment
Java Programming Language	Eight certifications targeting Java in regard to entry level, professional, specialized, and enterprise expertise
Solaris Operating System	Four certifications targeting Solaris OS in regard to entry level, system, network, and security administration expertise
MySQL	Four certifications targeting MySQL RDMBS in regard to entry level, database developer, DBA, and Cluster DBA expertise
OpenOffice.org	Three certifications targeting OpenOffice.org Writer, Calc, and Impress expertise
Sun Cluster	Single certification targeting Sun Cluster Administration
Java CAPS	Single certification targeting Java CAPS
Sun Identity Manager	Single certification targeting Sun Identity Manager

debuggers, the JUnit test tool, and the application profiler. Finally, Part IV wraps things up with a useful glossary and a variety of appendixes containing information on versions, the installation process, keymaps, code templates, database integration, sample projects, and NetBeans-related resources.

On the CD

For more information on the CD-ROM, please see “About the CD-ROM” at the back of the book.

Exam Readiness Checklist

At the end of the Introduction you will find an Exam Readiness Checklist. This table has been constructed to allow you to cross-reference the official exam objectives with the objectives as they are presented and covered in this book. The checklist also lets you gauge your level of expertise on each objective at the outset of your studies. This should allow you to check your progress and to make sure you spend the time you need on more difficult or unfamiliar sections. References have been provided for the objective exactly as the vendor presents it, the section of the study guide that covers that objective, and a chapter and page reference.

In Every Chapter

We’ve created a set of chapter components that call your attention to important items, reinforce important points, and provide helpful exam-taking hints. Take a look at what you’ll find in every chapter:

- Every chapter begins with **Certification Objectives**—what you need to know to pass the section on the exam dealing with the chapter topic. The Objective headings identify the objectives within the chapter, so you’ll always know an objective when you see it!
- **Exam Watch** notes call attention to information about, and potential pitfalls in, the exam. These helpful hints are written by authors who have taken the exams and received their certification (who better to tell you what to worry about?). They know what you’re about to go through!

exam

Watch

Note that unlike the Options window, the Plugin Manager window only has a Close button. This means that plugin updates, installs, deactivations,

and uninstalls happen immediately, as soon as you click the button. Also note that some plugins may require that you restart NetBeans for the changes to take effect.



- **Step-by-Step Exercises** are interspersed throughout the chapters. These are typically designed as hands-on exercises that allow you to get a feel for the real-world experience you need to pass the exams. They help you master skills that are likely to be an area of focus on the exam. Don't just read through the exercises—they are hands-on practice that you should be comfortable completing. Learning by doing is an effective way to increase your competency with a product.
- **On the Job** notes describe the issues that come up most often in real-world settings. They provide a valuable perspective on certification- and product-related topics. They point out common mistakes and address questions that have arisen from on-the-job discussions and experience.
- **Inside the Exam** sidebars highlight some of the most common and confusing problems that students encounter when taking a live exam. Designed to anticipate what the exam will emphasize, getting inside the exam will help ensure you know what you need to know to pass the exam. You can get a leg up on how to respond to those difficult-to-understand questions by focusing extra attention on these sidebars.
- **Scenario & Solution** sections lay out potential problems and solutions in a quick-to-read format.

SCENARIO & SOLUTION

You wish to perform refactoring operations on a class. What commands are available?	Rename, Move, Copy, Safely Delete, and Use Supertype Where Possible
You wish to perform refactoring operations on a field. What commands are available?	Rename, Safely Delete, Pull Up, Push Down, Extract Superclass, and Encapsulate Fields
You wish to perform refactoring operations in regard to unnesting inner classes. What commands are available?	Move Inner To Outer Level and Convert Anonymous To Inner

- The **Certification Summary** is a succinct review of the chapter and a restatement of salient points regarding the exam.
- ✓ ■ The **Two-Minute Drill** at the end of every chapter is a checklist of the main points of the chapter. It can be used for last-minute review.
- The **Self Test** offers questions similar to those found on the certification exams. The answers to these questions, as well as explanations of the answers, can be found at the end of each chapter. By taking the Self Test

Q&A

after completing each chapter, you'll reinforce what you've learned from that chapter while becoming familiar with the structure of the exam questions.

Some Pointers

Once you've finished reading this book, set aside some time to do a thorough review. You might want to return to the book several times and make use of all the methods it offers for reviewing the material:

- *Reread all the Two-Minute Drills*, or have someone quiz you. You also can use the drills as a way to do a quick cram before the exam. You might want to make some flash cards out of 3×5-inch index cards that have the Two-Minute Drill material on them.
- *Reread all the Exam Watch notes and Inside the Exam elements*. Remember that these notes are written by authors who have taken the exam and passed. They know what you should expect—and what you should be on the lookout for.
- *Review all the S&S sections* for quick problem solving.
- *Retake the Self Tests*. Taking the tests right after you've read the chapter is a good idea, because the questions help reinforce what you've just learned. However, it's an even better idea to go back later and do all the questions in the book in one sitting. Pretend that you're taking the live exam. When you go through the questions the first time, you should mark your answers on a separate piece of paper. That way, you can run through the questions as many times as you need to until you feel comfortable with the material.
- *Complete the Exercises*. Did you do the exercises when you read through each chapter? If not, do them! These exercises are designed to cover exam topics, and there's no better way to get to know this material than by practicing. Be sure you understand why you are performing each step in each exercise. If there is something you are not clear on, reread that section in the chapter.

ACKNOWLEDGMENTS

The NetBeans exam covers information from basic IDE configuration to building web applications. For this project, the divide-and-conquer authoring approach was taken by splitting up the chapters based on individual experience, expertise, and preference. Ryan led the chapters related to the core IDE including all of Part I (IDE configurations, builds and controls, and Java SE desktop applications) as well as the chapter on JUnit and the Profiler in Part III. Robert focused on four areas that he had a heightened interest in: web applications, database connectivity, the source editor, and refactoring. He also led up the HTTP Server-Side Monitor and debugging chapters in Part III of the book.

NetBeans IDE Project Team Acknowledgments

We would like to express our gratitude to all of the people who have played technical roles in the development of this book including:

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—Robert Liguori

Writing this book would not have been possible without the support of family and friends. I would especially like to thank the love of my life, Elsa, who has supported and encouraged me throughout the long, arduous process and the many long nights I was hunched over the computer. I would also like to thank Brian Leonard for encouraging me years ago to try out NetBeans. In addition, special thanks go to Willis Morse and Sally Baldwin for their invaluable corrections and suggestions. Finally, I would like to thank my coauthor, Robert, for recruiting me to this project and guiding me through the process.

—Ryan Cuprak

INTRODUCTION

This NetBeans IDE study guide has been designed to assist you in preparation of passing the NetBeans IDE Programmer Certified Expert exam. The information in this book is presented through textual content, coding examples, exercises, and more. Code examples have been validated on Windows Vista, Windows 7, and Macintosh OS X operating systems. In this book, information is covered in detail for all exam objectives. The main areas covered are as listed:

- General NetBeans IDE Configurations
- Builds and Controls
- Desktop Application Development
- Web Application Development
- Database Integration
- Source Editor Functionality
- General Refactoring
- HTTP Server-Side Monitoring
- Local and Remote Debugging
- JUnit Testing
- Application Profiling

The targeted NetBeans IDE version for the exam is 6.1. However, a good portion of the book was written against version 6.8 to take advantage of bug fixes, enhancements, and new features. NetBeans IDE 6.1 was used if the changes to the subsequent versions were significant enough to affect your study preparation and/or exam score. Table 2 details which NetBeans versions were used for each chapter and appendix.

TABLE 2

NetBeans
Versions Used
for Each Chapter
and Appendix

Chapter/Appendix	NetBeans Version
Chapter 1—General Configurations	NetBeans 6.8
Chapter 2—Builds and Controls	NetBeans 6.8
Chapter 3—Java SE Desktop Applications	NetBeans 6.8
Chapter 4—Java EE Web Applications	NetBeans 6.1, 6.9
Chapter 5—Database Connectivity	NetBeans 6.8
Chapter 6—Source Editor	NetBeans 6.8
Chapter 7—Refactoring	NetBeans 6.1
Chapter 8—HTTP Server-Side Monitor	NetBeans 6.8
Chapter 9—Local and Remote Debugging	NetBeans 6.8
Chapter 10—Testing and Profiling	NetBeans 6.8
Appendix A—NetBeans Versions	Recent versions
Appendix B—NetBeans Installations	NetBeans 6.8
Appendix C—NetBeans Keymap	NetBeans 6.1
Appendix D—NetBeans Code Templates	NetBeans 6.1
On the CD—NetBeans Database Integration	NetBeans 6.8
On the CD—NetBeans Sample Projects	NetBeans 6.8
On the CD—NetBeans Resources	All versions

Specifics about the NetBeans IDE Certification Exam

Oracle and Sun certification specifics about the NetBeans IDE exam objectives are detailed on their website at <http://education.oracle.com/>. Specifics about the exam process are supplied by Prometric when you enroll. However, we detail in the following sections the important information you will need to know to take the exam.

Dynamics of the NetBeans IDE Exam

The NetBeans IDE exam is geared toward software programmers and developers with extensive experience developing Java-based desktop and web applications with the NetBeans IDE. There are no prerequisites for this exam. You must get 36 of 61 questions correct, having a passing percentage of at least 59 percent. The designated time limit is 75 minutes. The exam is strictly multiple-choice questions and answers.

The current U.S. price to take the exam is \$300.00 but is subject to change. If you are employed by a technical organization, check to see if your company has an educational assistance policy. For education-related areas that do not

return a “grade” such as an exam, employers may require that the candidate pass the exam with a certain percentage. Candidates receive their percentage immediately following the exam and are sent a detailed summary of how they did on the exam with an overall percentage, as well as percentages per objective. This information breakdown can be beneficial when considering retaking the exam or when considering restudying weak areas. Oracle and Sun certification allow you to publish their credentials through the certification manager website at <http://certmanager.net/sun/>. Publishing credentials involves your selecting certification information to publish and forwarding that information via a form to e-mail recipients whom you wish to share the information with. The received e-mail will provide a link and password to view the published credentials from a secured server for a period of two weeks. It is important to note that the published credentials, also known as the Credential Verification Report, only provide a certified result, not the actual percentage of how a candidate has scored, as shown in Figure 1.

FIGURE 1 Published credentials example

The screenshot shows a Mozilla Firefox browser window displaying a 'Credential Verification Report' from integral7.com. The report is for Robert Liguori and was prepared on 03/15/2010, available until 03/29/2010. The report includes a 'Candidate Information' section with the name Robert Liguori. A 'Personal Note From Candidate' states: 'This report shows my credentials. -- RJL'. The 'Credentials' section is a table with columns: Credentials, Status, Certified, and Expires.

Credentials	Status	Certified	Expires
Java			
Java Associate			
■ Sun Certified Associate for Java Platform, SE	Certified	1/27/07	
Programmer Certification			
■ Sun Certified Programmer for the Java Platform 1.4	Certified	2/2/08	
Technology Specialist			
NetBeans IDE Specialist			
■ Sun Certified Specialist for NetBeans IDE	Certified	3/9/10	

The browser window also shows the Sun Microsystems logo and the URL <https://i7lp.integral7.com/durango/do/certifications/publishcertstatus/dis>.