



*Application Development  
Certification Roadmaps*



# Professional Certification Program from IBM

In today's ever-changing business environment, it's essential to keep pace with complex technologies and products. This is particularly true in the computer industry where advancements occur rapidly.

The **Professional Certification Program from IBM** is designed to help validate your skills as a technical professional in the latest IBM technology. Professional certification may help you excel at your job and contribute to your continued success and that of your company.

The **Professional Certification Program from IBM** provides you with a structured program leading to internationally recognized qualification. The program is designed for flexibility by allowing you to select your certification role and prepare for and take tests; in some cases, you can select from a choice of elective tests best suited to your abilities and needs. Some roles also offer a shortcut by giving credit for certification obtained in other company programs.

Whether you are a network administrator, systems integrator, network integrator, solution architect, service provider, consultant, value-added reseller, technical coordinator, sales support representative, or an education trainer, you can start charting your course through the **Professional Certification Program from IBM** today!

For more information, visit our Web site: <http://www.ibm.com/certify>

## IBM Application Development Certification

The Application Development certifications (IBM VisualAge, IBM WebSphere and XML) are designed for professionals who are in the business of providing product-specific, application development services.

For more information, refer to <http://www.ibm.com/software/ad/certify/>

## jCert Initiative, Inc.

jCert Initiative, Inc. is a collaborative effort by multiple companies to bring to market a common, standard, cross-vendor, Java™ technology certification offering. The IBM VisualAge for Java and IBM WebSphere certifications are aligned to jCert. The jCert companies are: AOL (Sun/Netscape Alliance), BEA, Hewlett-Packard, IBM, Oracle, Novell, Sun Microsystems, and Sybase.

For more information, refer to <http://www.ibm.com/software/ad/certify/>

# Table of Contents

## *IBM Application Development Certifications*

---

### **Roadmaps**

#### **IBM VisualAge**

IBM Certified Solution Developer - IBM VisualAge for Java, Professional Edition, <b>V2</b> <i>(will be retired March 31, 2000)</i> .....	1
IBM Certified Advanced Technical Expert - IBM VisualAge for Java, Enterprise Edition, <b>V2</b> .....	2
IBM Certified Specialist - IBM VisualAge for Java, Professional Edition, <b>V3</b> .....	3
IBM Certified Solution Developer - IBM VisualAge for Java, Professional Edition, <b>V3</b> .....	4
IBM Certified Solutions Expert - IBM VisualAge Pabase, <b>V2</b> .....	5

#### **IBM WebSphere**

IBM Certified Solutions Expert - IBM WebSphere Studio, <b>V3</b> .....	6
IBM Certified Specialist - IBM WebSphere Application Server, Standard Edition, <b>V2</b> <i>(will be retired May 31, 2000)</i> .....	7
IBM Certified Solution Developer - IBM WebSphere Application Server, Standard Edition, <b>V2</b> <i>(will be retired May 31, 2000)</i> .....	8
IBM Certified Specialist - IBM WebSphere Application Server, Standard Edition, <b>V3</b> .....	9
IBM Certified Solution Developer - IBM WebSphere Application Server, Standard Edition, <b>V3</b> .....	10
IBM Certified Enterprise Developer - IBM WebSphere Application Server, Advanced Edition, <b>V3</b> <i>(available March 27, 2000)</i> .....	11

#### **XML**

IBM Certified Developer - XML and Related Technologies, <b>V1</b> .....	12
---	----

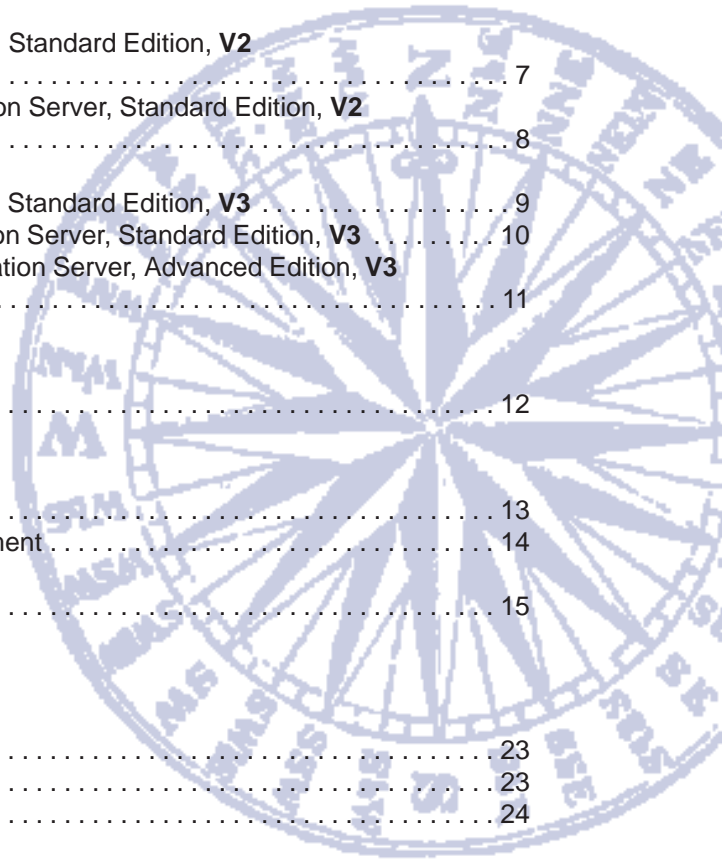
#### **SanFrancisco**

IBM Certified Instructor - SanFrancisco Basics, <b>V1</b> .....	13
IBM Certified Specialist - SanFrancisco Application Development .....	14

<b><u>Test Objectives</u></b> .....	15
-------------------------------------	----

### **Important Program Information**

Test Fees, Registration, and Administration .....	23
Certification Processing .....	23
Test Registration Centers .....	24



# IBM Certified Solution Developer

## IBM VisualAge for Java, Professional Edition, V2



### Role Description:

Note: This certification will be retired March 31, 2000.

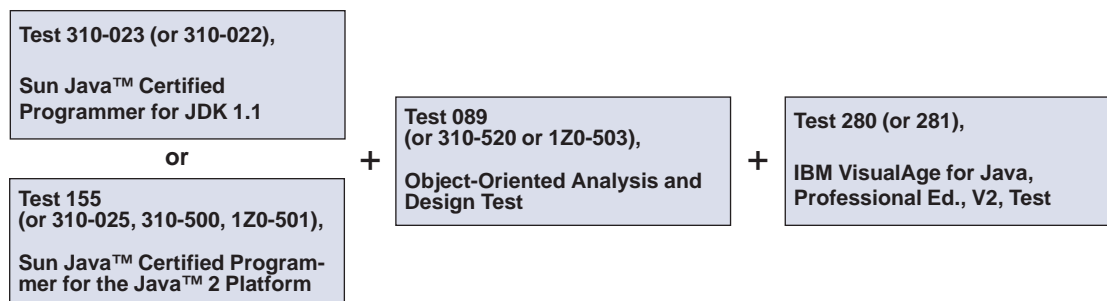
This certification is designed for professionals who provide product-specific, application development services using IBM VisualAge for Java.

This certification is part of the cross-vendor jCert Initiative, Inc.  
Refer to: <http://www.ibm.com/software/ad/certify/crossvendorcert.html>

### Recommended Prerequisites:

- Good working knowledge of the IBM VisualAge for Java, Professional Edition, V3 product  
Product can be downloaded from <http://www.ibm.com/software/ad/vajava>
- IBM VisualAge for Java, Professional Edition, V3 product documentation and tutorials that come with the product

### Core Requirements (3 Tests):



### Notes:

1. Test 310-023 and Test 310-022 are the same test. Test 310-022 will be accepted by IBM in place of Test 310-023.  
Tests 155, 310-025, 310-500, and 1Z0-501 are the same test. Test 310-500, 1Z0-501, or 310-025 will be accepted by IBM in place of Test 155.  
Upon completion of the test, Sun Microsystems will issue the programmer certificate.  
See Certification Processing in **Important Program Information**.
2. Test 089, 310-520, and 1Z0-503 are the same test. Test 310-520 or 1Z0-503 will be accepted by IBM in place of Test 089.
3. Test 089 is available in the English and Japanese language.
4. It is recommended that the tests be taken in the order illustrated above.
5. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
6. For test objectives, refer to the **Test Objectives** section in this document.
7. To prepare for the test based on the **Test Objectives**, refer to the website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

# IBM Certified Advanced Technical Expert

## IBM VisualAge for Java, Enterprise Edition, V2



### Role Description:

This certification is designed for professionals who provide product-specific, application development services using IBM VisualAge for Java.

### Required Prerequisites:

1. If you are taking Test N3227, at least two weeks prior, you must have already achieved one or more of the following certifications:
  - IBM Certified Developer - VisualAge for C++
  - IBM Certified Developer - VisualAge for COBOL
  - IBM Certified Developer - VisualAge for SmalltalkAt least two weeks prior to taking Test N3227 or Test N2228, you must have achieved the certification role of IBM Certified Solution Developer - IBM VisualAge for Java, Professional Edition, V2 or V3
2. At least two weeks prior to taking Test N3227 or Test N2228, you must complete and return the *VisualAge for Java Practicum: Candidate Profile Sheet*. Refer to: <http://www.ibm.com/software/ad/certify/adatjava>
3. At least two weeks prior to taking Test N3227 or Test N2228 it is strongly recommended that you complete the *VisualAge for Java Practicum Self Assessment*. Refer to: <http://www.ibm.com/software/ad/certify/adatjava>
4. It is recommended that you have practice and/or obtain actual project experience in:
  - Object-oriented application development using VisualAge for Java
  - Java programming using the JDK 1.1+
  - Application development and deployment for the WWW
  - Access and use of DB2 with VisualAge for Java in building small applications
  - Basic relational database knowledge, including SQL queries
  - Proof-of-Concept techniques as described in **A Practical Guide for Proof-of-Concept Engagements**. Refer to: <http://www.ibm.com/software/ad/certify/adatjava>
  - Unified Modeling Language, which uses a complement of other methodologies such as:
    - Jacobson's use cases
    - Responsibility Driven Design (RDD)
    - Object Modeling Technique (OMT) notation
    - Booch Methodology

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals

### Core Requirements:

IBM Certified Solution Developer - IBM Visual Age for Java, Professional Ed., V2 or V3

+

Test 482,  
Enterprise Connectivity Test

+

Test N2228/N3227,  
VisualAge for Java, Practicum

### Notes:

1. Test N3227 is only for professionals who have already achieved one or more of the following certifications:
  - IBM Certified Developer - IBM VisualAge for C++
  - IBM Certified Developer - IBM VisualAge for COBOL
  - IBM Certified Developer - IBM VisualAge for SmalltalkAll others must take Test N2228.
2. It is recommended that tests be taken in the order illustrated above.
3. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
4. For test objectives, refer to the **Test Objectives** section in this document.
5. To prepare for the test based on the **Test Objectives**, refer to the website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

# IBM Certified Specialist

## IBM VisualAge for Java, Professional Ed., V3



### Role Description:

The **Specialist** works with others to give **technical sales support** regarding application development services related to design, implementation, and deployment of Java - based solutions. These Java - based solutions include applications, applets, and servlets and typically make use of the JavaBeans™ component model and Java Database Connectivity (JDBC™) technology. The **Specialist** is expected to possess high level knowledge of object-oriented design methodologies, IBM VisualAge for Java, and the use of the Java language.

### Recommended Prerequisites:

- IBM VisualAge for Java, Professional Edition, V3 product documentation and tutorials that come with the product. Product can be downloaded from <http://www.ibm.com/software/ad/vajava>
- For those new to Java programming and the VisualAge, make use of the online tutorials available free of charge in the Education section of the Java Zone of IBM's DeveloperWorks (accessible via <http://www.ibm.com/developer/java>)
- Experience applying the tool on a real project

### Core Requirement (1 test):

Test 282,

IBM VisualAge for Java,  
Professional Ed., V3 Test

#### Notes:

1. For test objectives, refer to the **Test Objectives** section in this document.
2. To prepare for the test based on the **Test Objectives**, refer to the website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.
3. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

# IBM Certified Solution Developer

## IBM VisualAge for Java, Professional Ed., V3



### Role Description:

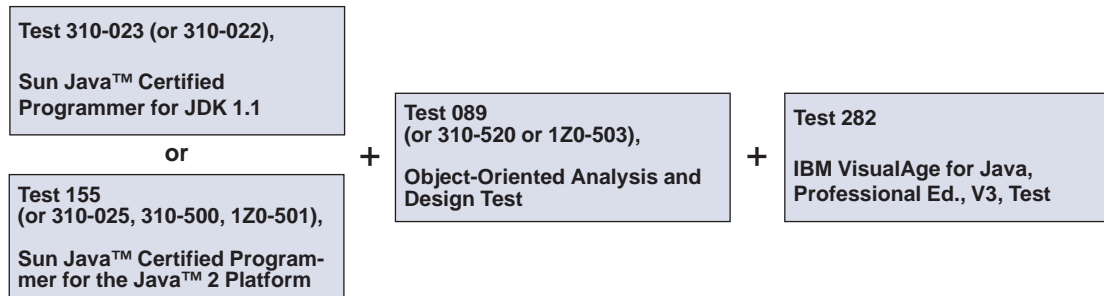
The **Solution Developer** provides application development services related to design, implementation, and deployment of Java - based solutions. These Java - based solutions include applications, applets, and servlets and typically make use of the JavaBeans™ component model and Java Database Connectivity (JDBC™) technology. The **Solution Developer** is expected to apply object-oriented design methodologies, make proper use of IBM VisualAge for Java, and exhibit proficiency in the use of the Java language itself.

This certification is part of the cross-vendor jCert Initiative, Inc.,  
<http://www.ibm.com/software/ad/certify/crossvendorcert.html>

### Recommended Prerequisites:

- Good working knowledge of the IBM VisualAge for Java, Professional Edition, V3 product. Product can be downloaded from <http://www.ibm.com/software/ad/vajava>
- IBM VisualAge for Java, Professional Edition, V3 product documentation and tutorials that come with the product
- For those new to Java programming and VisualAge, make use of the online tutorials available free of charge in the Education section of the Java Zone of IBM's DeveloperWorks (accessible via <http://www.ibm.com/developer/java>)
- Experience applying the tool on a real project

### Core Requirement (3 Tests):



### Notes:

1. Test 310-023 and Test 310-022 are the same test. Test 310-022 will be accepted by IBM in place of Test 310-023.  
Tests 155, 310-025, 310-500, and 1Z0-501 are the same test. Test 310-500, 1Z0-501, or 310-025 will be accepted by IBM in place of Test 155.  
Upon completion of the test, Sun Microsystems will issue the programmer certificate.  
See Certification Processing in **Important Program Information**.
2. Test 089, 310-520, and 1Z0-503 are the same test. Test 310-520 or 1Z0-503 will be accepted by IBM in place of Test 089.
3. Test 089 is available in the English and Japanese language.
4. It is recommended that the tests be taken in the order illustrated above.
5. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
6. For test objectives, refer to the **Test Objectives** section in this document.
7. To prepare for the test based on the **Test Objectives**, refer to the website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

# *IBM Certified Solutions Expert*

## *IBM VisualAge Pacbase, V2*



### **Role Description:**

This certification is designed for professionals who provide product specific application development services using IBM VisualAge Pacbase.

### **Recommended Prerequisites:**

- Minimum of 1 year field experience in Client/Server design and programming
- Management knowledge of the VisualAge Pacbase repository
- Development knowledge of client applications using Pacbase
- Technical and teaching skills of application development using Pacbase
- Wide experience of all parts of Pacbase
- Good knowledge of computing

### **Core Requirement (1 test):**

**Test 398,**

**IBM VisualAge Pacbase, V2.5,  
Test**

#### Notes:

1. Test 398 is available in the English and French language.
2. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
3. For test objectives, refer to the **Test Objectives** section in this document.
4. To prepare for the test based on the **Test Objectives**, refer to the Website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### **Benefits:**

- *Certificate*
- *Wallet-size certificate*
- *Lapel pin*
- *Certification logo*
- *Inclusion in the Directory of IBM Application Development Certified Professionals*
- *Recognition by IBM PartnerWorld*



# IBM Certified Solutions Expert

## IBM WebSphere Studio, V3



### Role Description:

The **IBM Certified Solutions Expert - IBM WebSphere Studio, V3** designs and creates the front-end portion of the Internet/Intranet application. This individual creates web elements, assembles the elements, and tests, publishes and maintains the application.

This **Solutions Expert** uses visual programming tools to build JavaBeans, uses IBM WebSphere Studio wizards to generate servlets and JavaServer Pages, and tests and deploys the web applications.

The **Solutions Expert** also creates applets and JavaBeans using the Applet Designer tool, develops graphics using the Web Art Designer tool, assembles web elements using the Page Designer tool, and publishes/tests/maintains the site using the Studio Workbench.

This **Solutions Expert** may work in a collaborative development environment where there is an architect present or on a smaller scale project where there is no lead architect but, instead, direct customer input.

### Recommended Prerequisites:

- Knowledge of the IBM WebSphere Studio, V3 product. The product is free of charge and can be downloaded from: <http://www.ibm.com/software/webservers>
- A good understanding of Java Script, HTML, Java applets, Java Server Pages, Servlets, JavaBeans, and the use of resource files and relational databases

### Core Requirement (1 test):

Test 493,

IBM WebSphere Studio, V3,  
Test

#### Notes:

1. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
2. For test objectives, refer to the **Test Objectives** section in this document.
3. To prepare for the test based on the **Test Objectives**, refer to the Website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### Benefits:

- *Certificate*
- *Wallet-size certificate*
- *Lapel pin*
- *Certification logo*
- *Inclusion in the Directory of IBM Application Development Certified Professionals*
- *Recognition by IBM PartnerWorld*

# IBM Certified Specialist

## IBM WebSphere Application Server, Standard Edition, V2



### Role Description:

Note: This certification will be retired May 31, 2000.

The **Certified Specialist** works with others (e.g. web site designers, webmasters) to give **technical sales support** on building a web site using **IBM WebSphere Application Server, Standard Edition, V2**. The technical sales support may include giving a demonstration of the product in a customer environment that includes knowledge of:

1. Using WebSphere and JSP facilities
2. Writing, testing and debugging Java Servlets and JavaBeans
3. Utilizing WebSphere connectors
4. Thread safe program design
5. Installing a development and test environment
6. Utilizing WebSphere API's
7. Application Server concepts

### Recommended Prerequisite:

- Knowledge of the IBM WebSphere Application Server, Standard Edition, V2 product

### Core Requirement (1 Test):

Test 492,

**IBM WebSphere Application  
Server, Standard Ed., V2, Test**

Notes:

1. Test 492 is available in the English and French language.
2. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
3. For test objectives, refer to the **Test Objectives** section in this document.
4. To prepare for the test based on the **Test Objectives**, refer to the Website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

# IBM Certified Solution Developer

## IBM WebSphere Application Server, Standard Edition, V2



### Role Description:

Note: This certification will be retired May 31, 2000.

**IBM Certified Solution Developer - IBM WebSphere Application Server, Standard Edition, V2** works with the web site designer and webmaster to provide and build the components needed for an Internet/intranet site. This **Solution Developer** creates, maintains and provides technical assistance for IBM WebSphere Application Server components. The **Solution Developer** understands and uses **IBM WebSphere Application Server**, including:

1. Understanding and using WebSphere and JSP facilities
2. Writing, testing and debugging Java Servlets and JavaBeans
3. Utilizing WebSphere connectors
4. Understanding thread safe program design
5. Installing a development and test environment
6. Utilizing WebSphere API's
7. Understanding Application Server concepts

This certification is part of the cross-vendor jCert Initiative, Inc.

Refer to: <http://www.ibm.com/software/ad/certify/crossvendorcert.html>

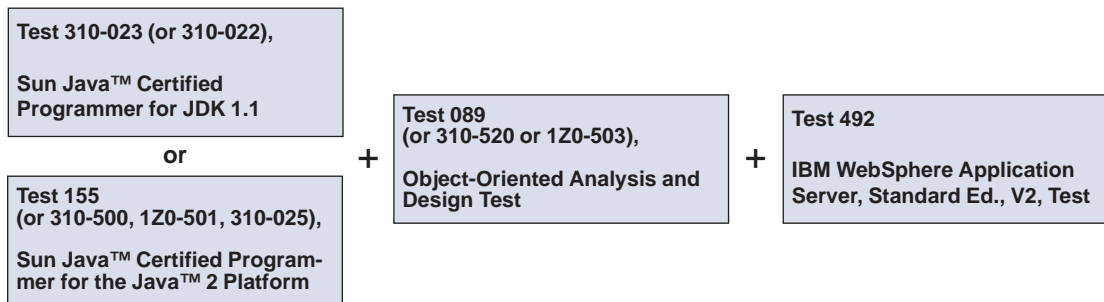
### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

### Recommended Prerequisites:

- Knowledge of the IBM WebSphere Application Server, Standard Edition, V2 product

### Core Requirements (3 tests):



### Notes:

1. Test 310-023 and Test 310-022 are the same test. Test 310-022 will be accepted by IBM in place of Test 310-023.  
Tests 155, 310-025, 310-500, and 1Z0-501 are the same test. Test 310-500, 1Z0-501, or 310-025 will be accepted by IBM in place of Test 155.  
Upon completion of the test, Sun Microsystems will issue the programmer certificate.  
See Certification Processing in **Important Program Information**.
2. Test 089, 310-520, and 1Z0-503 are the same test. Test 310-520 or 1Z0-503 will be accepted by IBM in place of Test 089.
3. Tests 089 and 492 are available in the English and Japanese language.
4. It is recommended that the tests be taken in the order illustrated above.
5. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
6. For test objectives, refer to the **Test Objectives** section in this document.
7. To prepare for the test based on the **Test Objectives**, refer to the website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

# IBM Certified Specialist

## IBM WebSphere Application Server, Standard Edition, V3



### Role Description:

The **IBM Certified Specialist - IBM WebSphere Application Server, Standard Edition, V3** works with others (e.g., web site designers, webmasters) to give **technical sales support** on building a web site using the **IBM WebSphere Application Server, Standard Edition, V3**. The technical sales support may include giving a demonstration of the product in a customer environment that includes knowledge of:

1. Application Server concepts and programming model including:
  - a. Architecting for separation of functional responsibilities
  - b. Implementation of distinct layers for Presentation, Controller and Model
  - c. Implementation of thread safe server-side programming
2. Development, testing, debugging and deployment of:
  - a. Java Servlets (JSDK 2.1 or JSWDK X)
  - b. JavaBeans
  - c. Java Server Pages (JSP) (version 1.0)
3. Installation and configuration of the WebSphere Application Server from a developer's perspective
4. Utilization of WebSphere facilities and APIs

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

### Recommended Prerequisites:

- Knowledge of the IBM WebSphere Application Server, Standard Edition V3 product. The product can be downloaded from: <http://www.ibm.com/software/webservers>

### Core Requirement (1 test):

Test 494,

**IBM WebSphere Application  
Server, Standard Ed., V3, Test**

### Notes:

1. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
2. For test objectives, refer to the **Test Objectives** section in this document.
3. To prepare for the test based on the **Test Objectives**, refer to the Website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

# IBM Certified Solution Developer

## IBM WebSphere Application Server, Standard Edition, V3



### Role Description:

The **IBM Certified Solution Developer - IBM WebSphere Application Server, Standard Edition, V3** works with the web site designer and webmaster to provide and build the components needed for an Internet/Intranet site. This **Solution Developer** creates and maintains web applications from a set of defined specifications, and provides technical assistance for IBM WebSphere Application Server components. This developer understands and uses the IBM WebSphere Application Server including:

1. Application Server concepts and programming model including:
  - a. Architecting for separation of functional responsibilities
  - b. Implementation of distinct layers for Presentation, Controller and Model
  - c. Implementation of thread safe server-side programming
2. Development, testing, debugging and deployment of
  - a. Java Servlets (JSDK 2.1 or JSWDK X)
  - b. JavaBeans
  - c. Java Server Pages (JSP) (version 1.0)
3. Installation and configuration of the WebSphere Application Server from a developer's perspective
4. Utilization of WebSphere facilities and APIs

This certification is part of the cross-vendor jCert Initiative, Inc.  
Refer to: <http://www.ibm.com/software/ad/certify/crossvendorcrt.html>

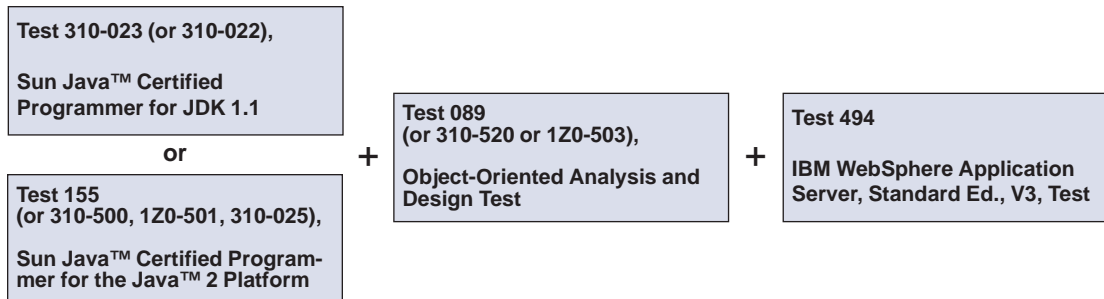
### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

### Recommended Prerequisites:

- Knowledge of the following Java APIs:
  - JSDK 2.1 and JSWDK X
  - JSP 1.0
  - JDK 1.1 X
- Knowledge of the following standards:
  - SSL
  - HTML
  - HTTP versions 1.0 and 1.1 protocol
- Knowledge of the IBM WebSphere Application Server, Standard Edition V3 product. Free of charge for development purposes, it can be downloaded from: <http://www.ibm.com/software/web-servers>

### Core Requirements (3 tests):



### Notes:

1. Test 310-023 and Test 310-022 are the same test. Test 310-022 will be accepted by IBM in place of Test 310-023. Tests 155, 310-025, 310-500, and 1Z0-501 are the same test. Test 310-500, 1Z0-501, or 310-025 will be accepted by IBM in place of Test 155.  
Upon completion of the test, Sun Microsystems will issue the programmer certificate. See Certification Processing in **Important Program Information**.
2. Test 089, 310-520, and 1Z0-503 are the same test. Test 310-520 or 1Z0-503 will be accepted by IBM in place of Test 089.
3. Tests 089 is available in the English and Japanese language.
4. It is recommended that the tests be taken in the order illustrated above.
5. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
6. For test objectives, refer to the **Test Objectives** section in this document.
7. To prepare for the test based on the **Test Objectives**, refer to the website <http://www.ibm.com/certify> for test descriptions, recommended educational

# IBM Certified Enterprise Developer

## IBM WebSphere Application Server, Advanced Edition, V3



### Role Description:

### Benefits:

The **IBM Certified Enterprise Developer -- IBM WebSphere Application Server, Advanced Edition, V3** works with business analysts, application architects, and application assemblers to create enterprise software components (Enterprise JavaBeans, EJBs) that model an organization's practices, processes, and concepts. This developer mentors application assemblers on the usage of EJBs as well as specific enterprise software components within the business domain. This developer also works with system administrators and deployers to configure and deploy components and applications.

- *Certificate*
- *Lapel pin*
- *Certification camera-ready logo (for use in advertising or in your business literature)*
- *Inclusion in the Directory of IBM Application Development Certified Professionals.*

The **IBM Certified Enterprise Developer** creates and maintains EJBs, deploys and configures EJBs, and supports the development of clients that access EJBs.

This developer can:

1. demonstrate knowledge and appropriate use of the APIs comprising the Java 2 Platform, Enterprise Edition (J2EE)
2. design enterprise applications which:
  - A. clearly separate functional responsibilities
  - B. implement distinct layers for Presentation, Controller and Model
  - C. implement thread safe server-side code
  - D. employ robust data access strategies and techniques
  - E. include transactional behavior
3. develop, test, debug and deploy enterprise applications using IBM WebSphere Application Server, Advanced Edition and IBM VisualAge for Java, Enterprise Edition

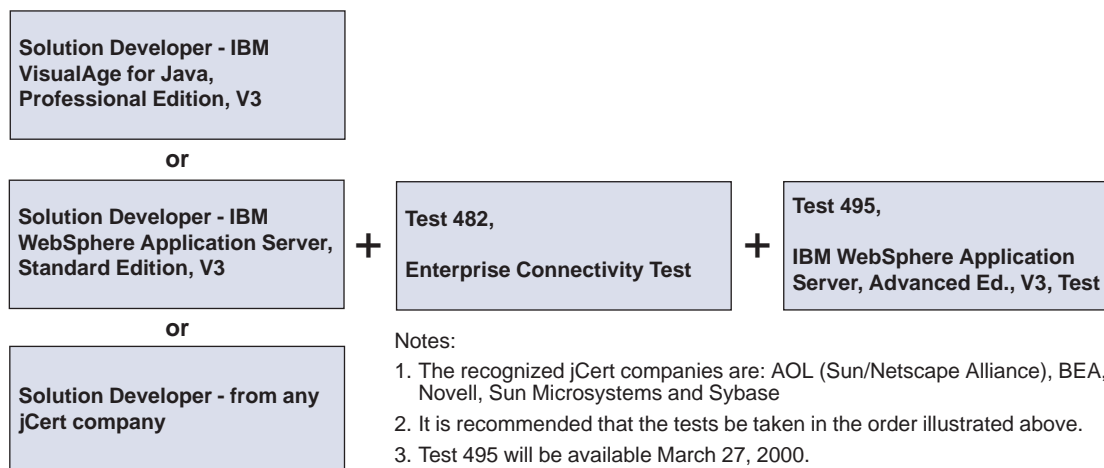
This certification is part of the cross-vendor jCert Initiative, Inc.

Refer to: <http://www.ibm.com/software/ad/certify/crossvendorcert.html>

### Recommended Prerequisites:

- Knowledge of the following Java APIs:
  - JSDK 2.1 and JSWDK 1.X
  - JSP 1.0
  - JDK 1.1X
  - EJB 1.0
- Items under **Recommended Educational Resources** under **Core Requirements** below

### Core Requirements:



#### Notes:

1. The recognized jCert companies are: AOL (Sun/Netscape Alliance), BEA, Hewlett-Packard, IBM, Oracle, Novell, Sun Microsystems and Sybase
2. It is recommended that the tests be taken in the order illustrated above.
3. Test 495 will be available March 27, 2000.
4. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
5. For test objectives, refer to the **Test Objectives** section in this document.
6. To prepare for the test based on the **Test Objectives**, refer to the website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

# IBM Certified Developer

## XML and Related Technologies, V1



### Role Description:

The developer designs and implements applications that make use of XML. The developer has a strong understanding of XML fundamentals; a broad knowledge of XML concepts and related technologies; understands how data relates to XML, in particular with issues associated to information modelling, XML processing, XML rendering and XML query; has a thorough knowledge of core XML related W3C recommendations; and is familiar with well known, best practices.

### Recommended Prerequisites:

- Experience in designing and implementing computer applications
- Background in programming/scripting and understanding of basic computer science models and data structures. In particular, familiarity with the following XML related computer science concepts: tree traversal, recursion, reuse of data.
- Familiarity with Internet standards and concepts (e.g., Web Browser, client-server, relational databases, documenting, formatting, e-commerce)

### Core Requirement (1 test):

Test 140,

XML and Related Technologies, V1, Test

Notes:

1. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
2. For test objectives, refer to the **Test Objectives** section in this document.
3. To prepare for the test based on the **Test Objectives**, refer to the Website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo
- Inclusion in the Directory of IBM Application Development Certified Professionals
- Recognition by IBM PartnerWorld

# IBM Certified Instructor

## SanFrancisco Basics, V1



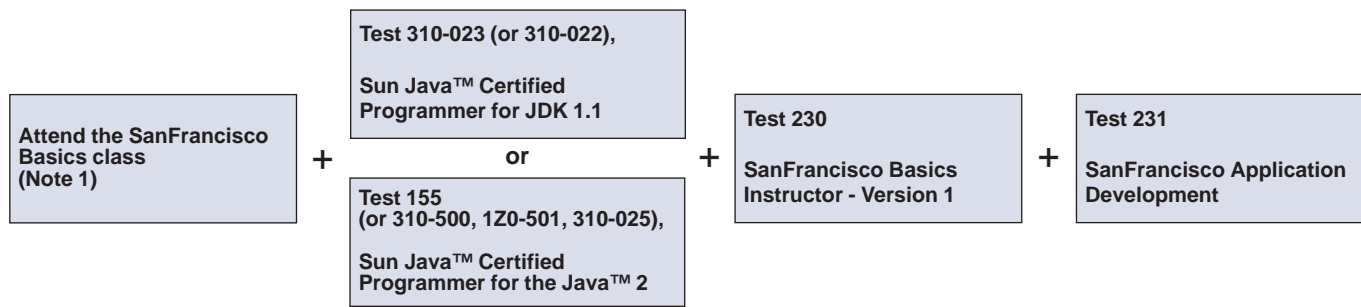
### Role Description:

Successful completion of this certification qualifies individuals to teach the “SanFrancisco Basics Version 1” course and demonstrates your mastery of technical trainer skills. This certification validates your skills in SanFrancisco installation, programming, debug, and tools.

### Recommended Prerequisite:

- Experience building one or more SanFrancisco applications

### Core Requirements (1 class, 3 tests, technical trainer skills):



#### Mastery of technical trainer skills (one required):

- Certification to teach a software vendor technical class  
Candidates must demonstrate their qualification to teach a technical course for a software vendor. The qualifying instructor certifications are any offered by the following software vendors:
  - Banyan Vines
  - IBM (IBM CI)
  - Lotus (CLI)
  - Microsoft (MCT)
  - Novell
  - Santa Cruz Operation
  - Sun Microsystems
- Certified Technical Trainer (CTT) status  
Candidates must demonstrate that they are a Certified Technical Trainer (CTT) in the program of the Chauncey Group International. Candidates can contact the Chauncey Group by:
  - Telephone: (800) 258-4914 in the United States
  - Email: [cttp@ets.org](mailto:cttp@ets.org)
  - Web: <http://www.chauncey.com>

#### Notes:

- 1: Please contact the representative through whom you registered for the class. Please request that confirmation of your attendance be sent to:  
  
Professional Certification Program from IBM  
IBM Corporation  
11400 Burnet Road, Mail Drop 3013  
Austin, TX  
78758 USA  
Attn: IBM Certified Instructor - SanFrancisco Basics Version 1  
Fax: (512) 838-7961
2. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
3. For test objectives, refer to the **Test Objectives** section in this document.
4. To prepare for the test based on the **Test Objectives**, refer to the Website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo



# IBM Certified Specialist

## SanFrancisco Application Development



### Role Description:

Successful completion of this certification attests to the ability of the individual to develop SanFrancisco business applications. This certification validates your skills in SanFrancisco application design, implementation, database interface, error correction, and environment configuration.

### Recommended Prerequisites:

- Attend the SanFrancisco Basics class
- Attend the SanFrancisco Application Development class
- Experience building one or more SanFrancisco applications

### Core Requirements (2 tests):

Test 310-023 (or 310-022),

Sun Java™ Certified  
Programmer for JDK 1.1

or

Test 155  
(or 310-500, 1Z0-501, 310-025),

Sun Java™ Certified  
Programmer for the Java™ 2

+

Test 231

SanFrancisco Application  
Development

### Notes:

1. For information on test fees, registration, administration and certification processing, refer to **Important Program Information**.
2. For test objectives, refer to the **Test Objectives** section in this document.
3. To prepare for the test based on the **Test Objectives**, refer to the Website <http://www.ibm.com/certify> for test descriptions, recommended educational resources and sample tests.

### Benefits:

- Certificate
- Wallet-size certificate
- Lapel pin
- Certification logo

# Test Objectives

Test Number	Test Objectives
<b>Test 089</b> (or 310-520 or 1Z0-503)	<b>Object-Oriented Analysis and Design</b> Individuals who successfully complete <b>Test 089, Object-Oriented Analysis and Design</b> , will have demonstrated knowledge in: <ol style="list-style-type: none"><li>1. Object-oriented concepts, analysis and design principles</li><li>2. Object-oriented analysis and design techniques using the Unified Modeling Language (UML).</li><li>3. Essential concepts such as:<ul style="list-style-type: none"><li>• Incremental vs. iterative development</li><li>• View-model-persistence segmentation architecture</li><li>• Types of object relationship - aggregation, generalization, association multiplicity/cardinality of object relationships, qualified associations responsibility-driven design technique</li><li>• Use case, use case model</li><li>• Object interaction diagram, activity diagram</li><li>• Deployment diagram, state transition diagram</li><li>• CRC card</li><li>• Encapsulation, inheritance, polymorphism</li><li>• Packages</li><li>• UML notation</li></ul></li></ol>
<b>Test 140</b>	<b>XML and Related Technologies, V1, Test</b> Individuals who successfully complete <b>Test 140, XML and Related Technologies, V1 Test</b> , will have demonstrated knowledge and skills associated with the following XML developer-related tasks: <ol style="list-style-type: none"><li>1. Design<ul style="list-style-type: none"><li>• Determine the implications of a given architecture on XML design considerations</li><li>• Determine how W3C recommendations will be applied (e.g., determine when DOM is appropriate, etc.)</li><li>• Use the details and syntax of core W3C recommendations (XML, XSL, DOM, XPath, namespaces, DTDs, XML well-formedness)</li><li>• Identify what features of XML are W3C recommended and standardized in order to develop a W3C-compliant application</li><li>• Given an architecture, design functional components</li><li>• Given an architecture, define interconnections among functional components</li><li>• Given an architecture, select appropriate tools/libraries</li><li>• Refine design as necessary based on data model, data integration, data rendering, and data query issues</li></ul></li><li>2. Information Modeling<ul style="list-style-type: none"><li>• Analyze data/documents for structure</li><li>• Represent structure in XML form</li><li>• Define DTDs</li></ul></li><li>3. XML Processing<ul style="list-style-type: none"><li>• Identify point of data integration</li><li>• Define the optimal integration approach at each point (e.g., XSL transformation and DOM)</li><li>• Establish linking relationships</li><li>• Consider data integration and linking issues when designing data models</li></ul></li><li>4. XML Rendering<ul style="list-style-type: none"><li>• Identify rendering/transformation targets (e.g., Web pages, print, pervasive, etc.)</li><li>• Define the optimal rendering approach for each target</li><li>• Consider data rendering issues when designing data models</li></ul></li><li>5. XML Query<ul style="list-style-type: none"><li>• Identify data to be retrieved for resulting subset of data</li><li>• Define the optimal retrieval approach for each dataset</li><li>• Consider query constraints when designing data models (e.g., metadata, inner structure, additional attributes)</li></ul></li><li>6. Implementation/Testing<ul style="list-style-type: none"><li>• Determine optimal development environment using standard tools as appropriate (e.g., DTD editors, XSL and style sheet editors, XSL debuggers, XML editors)</li><li>• Determine best use of APIs to XSL processors &amp; XML processors</li><li>• Assess performance tradeoffs</li><li>• Implement a given design (including the data model, data integration, data rendering, functional components, and interconnections among functional components)</li><li>• Create instances to test (e.g., based on data model, boundary cases)</li><li>• Address exceptions (e.g., parser and DOM errors)</li></ul></li></ol>
<b>Test 155</b> (or 310-500 or 1Z0-501 or 310-025)	<b>Sun Certified Programmer for the Java™ 2 Platform</b> Refer to the Web site: <a href="http://suned.sun.com/usa/cert_progs.html">http://suned.sun.com/usa/cert_progs.html</a>

Test Number	Test Objectives
<b>Test 230</b>	<p><b>SanFrancisco Basics Instructor - Version 1</b>  Individuals who successfully complete <b>Test 230, SanFrancisco Basics Instructor - Version 1</b>, will have demonstrated knowledge in:</p> <ol style="list-style-type: none"> <li>1. Structure <ul style="list-style-type: none"> <li>• Understand the SanFrancisco directory structure</li> <li>• Understand the components of the Logical SanFrancisco Network</li> <li>• Understand the layers of the SanFrancisco architecture and their functions (platform, foundation, common business objects, core business processes, application software)</li> <li>• Understand the characteristics of SanFrancisco processes and threads</li> </ul> </li> <li>2. Environment and Tools <ul style="list-style-type: none"> <li>• Understand the considerations of the Java environment as how they relate to SanFrancisco</li> <li>• Understand and use the Configuration, Access Rights Admin, Schema Mapping, Conflict Control, Print and Backup Utilities to manage a SanFrancisco application.</li> </ul> </li> <li>3. Business Objects <ul style="list-style-type: none"> <li>• Understand the characteristics of SanFrancisco business objects and how to apply those characteristics in a business application design</li> <li>• Understand how to implement subclasses of SF Entity, Dependent, and Commands</li> <li>• Understand the concrete Base classes and how to use them (Collections, DTime, DDecimal, etc.)</li> <li>• Understand the purpose of extension points and how to identify and use them</li> </ul> </li> <li>4. Client Programming <ul style="list-style-type: none"> <li>• Understand and use the SF Client Programming Model and related classes (BaseFactory, AccessMode, Notification, etc)</li> <li>• Understand and use the characteristics of SanFrancisco processes and threads</li> <li>• Understand and use the SanFrancisco security model to build secure applications</li> <li>• Use the SanFrancisco transaction model to build applications that maintain the integrity of their information</li> <li>• Understand and use the SanFrancisco persistence features to meet application requirements</li> <li>• Understand and use the SanFrancisco object distribution features to meet application requirements.</li> </ul> </li> <li>5. Problem Resolution <ul style="list-style-type: none"> <li>• Identify and correct SanFrancisco configuration problems</li> <li>• Identify and correct SanFrancisco environment problems</li> <li>• Identify and correct SanFrancisco programming errors</li> </ul> </li> </ol>
<b>Test 231</b>	<p><b>SanFrancisco Application Development</b>  Individuals who successfully complete <b>Test 231, SanFrancisco Application Development</b>, will have demonstrated knowledge in:</p> <ol style="list-style-type: none"> <li>1. Design Business Objects <ul style="list-style-type: none"> <li>• Map business classes to SanFrancisco Framework elements <ol style="list-style-type: none"> <li>A. Identify new Entity, Dependent and Command subclasses to implement application business classes</li> <li>B. Identify concrete Financial CBOs, General business CBOs and Base classes to reuse in the business application</li> <li>C. Identify correct patterns (Property Container, Controller, Policy, etc.) to employ in designing the application</li> </ol> </li> <li>• Identify points in framework to extend <ol style="list-style-type: none"> <li>A. Find relevant extension points in SanFrancisco Rose model of the towers and CBOs</li> <li>B. Review possibilities and identify the best choice</li> </ol> </li> </ul> </li> <li>2. Implement Business Objects <ul style="list-style-type: none"> <li>• Place correct additional SanFrancisco information in the Object-Oriented Application Development tool to allow code generation</li> <li>• Generate the SanFrancisco code</li> <li>• Translate the elements of the design that could not be automatically generated into Java code <ol style="list-style-type: none"> <li>A. Identify missing and incomplete methods</li> <li>B. Create correct implementation code</li> </ol> </li> </ul> </li> <li>3. Interface with Databases <ul style="list-style-type: none"> <li>• Identify correct persistent store (POSIX, Relational, Legacy relational)</li> <li>• Perform required schema mapping and extended schema mapping tasks</li> </ul> </li> </ol>

<b>Test Number</b>	<b>Test Objectives</b>
<b>Test 231 (cont'd.)</b>	<ol style="list-style-type: none"> <li>4. Build Client Programs <ul style="list-style-type: none"> <li>• Understand and use the SanFrancisco Client Programming Model (AccessMode, Base-Factory, Notification, Query, etc.)</li> <li>• Understand the SanFrancisco security model and use it in building secure applications <ol style="list-style-type: none"> <li>A. Understand and use authentication</li> <li>B. Understand and use authorization</li> </ol> </li> <li>• Use the SanFrancisco transaction model to build applications that maintain the integrity of their information: understand transaction scope and transaction control</li> </ul> </li> <li>5. Diagnose and Fix San Francisco Errors <ul style="list-style-type: none"> <li>• Identify and correct configuration problems</li> <li>• Identify and correct environment problems</li> <li>• Identify and correct programming errors</li> </ul> </li> <li>6. Administer and Configure SanFrancisco <ul style="list-style-type: none"> <li>• Understand the Logical SanFrancisco Network components and structure</li> <li>• Understand and use the SanFrancisco utilities (Configuration, Access, Rights Admin, Server Management, Print Utility, etc)</li> </ul> </li> </ol>
<b>Test 280 (or 281)</b>	<p><b>VisualAge for Java, Professional Edition, V2</b>  Individuals who successfully complete <b>Test 280/281, VisualAge for Java, Professional Edition, V2</b> will have demonstrated knowledge in:</p> <ol style="list-style-type: none"> <li>1. Construction and deployment of Web-enabled programs (applications, applets and servlets) <ul style="list-style-type: none"> <li>• Differences between applets, applications, and servlets</li> <li>• Packaging Java programs</li> <li>• Basic knowledge of Web Servers</li> <li>• Basic knowledge of Web Browsers</li> <li>• How VisualAge for Java fits into development processes</li> </ul> </li> <li>2. Accessing databases using VisualAge for Java <ul style="list-style-type: none"> <li>• ODBC vs. JDBC</li> <li>• Using the Data Access Beans</li> </ul> </li> <li>3. Visual Programming using VisualAge for Java and JavaBeans <ul style="list-style-type: none"> <li>• How to use JavaBeans in the Visual Composition Editor (VCE)</li> <li>• How to use the VCE</li> <li>• Knowledge of how and when to use the different connection types</li> <li>• Use of visual JavaBeans</li> <li>• Knowledge of Java Foundation Classes (Swing)</li> <li>• Knowledge of how to use the Data Access beans with JFC/Swing components</li> </ul> </li> <li>4. Creating JavaBeans using VisualAge for Java <ul style="list-style-type: none"> <li>• Understanding of JavaBeans</li> <li>• How to use the BeanInfo page</li> <li>• Knowledge of how to construct a custom property editor for a JavaBean</li> </ul> </li> <li>5. Developing Java Programs using VisualAge for Java <ul style="list-style-type: none"> <li>• Generating code</li> <li>• Testing</li> <li>• Using the Debugger</li> <li>• Writing Java code</li> </ul> </li> <li>6. Using VisualAge for Java code management facilities, including use of the Repository Explorer tool <ul style="list-style-type: none"> <li>• Repository access and management</li> <li>• Version control</li> <li>• Purging and compacting the repository</li> </ul> </li> <li>7. Knowledge of the VisualAge for Java Environment <ul style="list-style-type: none"> <li>• Using the Console</li> <li>• Using the Log</li> <li>• Using the Scrapbook</li> <li>• Visual cues and clues</li> <li>• Navigation</li> </ul> </li> <li>8. Basic knowledge and use of Remote Method and Invocation (RMI) in VisualAge for Java</li> </ol>

## Test 282

**IBM VisualAge for Java, Professional Edition V3, Test**

Individuals who successfully complete *Test 282, IBM VisualAge for Java, Professional Edition V3, Test*, will have demonstrated knowledge in:

1. Construction and Deployment of Java-based Solutions, including Applications, Applets and Servlets
  - For a given situation, choose the appropriate type of java program (Application, Applet, or Servlet) and assess their basic technical requirements
  - Deploy Java code and associated files for Applets, Servlets, and Applications
2. Access Databases and Use Remote Method Invocation (RMI) in the development of Java-based Solutions
  - Access databases using Data Access Beans, JDBC, SQLJ
  - Connect database query results to forms or UI controls
  - Use VisualAge for Java to aid implementation of RMI
3. Use Visual Programming and the Existing Library of JavaBeans to Create Java-based solutions
  - Add JavaBeans to the Composition Surface
  - Create connections in the Composition Editor and recognize meaning of the different types and appearances of connections
  - Change the properties and parameters of connections
  - Explain how and when to promote bean features
  - Modify bean settings and understand the resulting changes that occur on the composition surface and in generated code
  - Reorder connections and understand the effects
  - Tear off properties of a Java Bean and understand the resulting changes that occur on the composition surface and in generated code
  - Use Variables on the Composition Surface and understand the results on the composition surface and in the generated code
  - Use and modify visual beans
  - Use the Morph Into function on the Composition Editor
  - Apply appropriate Bean given a required functionality (such as, use proper Visual Bean for required user interface)
  - Use the Visual Composition Editor to specify, change, and configure the layout and layout manager of a Visual Bean
  - Identify and change the tab order of visual beans
  - Create or consume re-usable panels (i.e. forms)
  - Use Object Factories and understand the results on composition surface and generated code
  - Understand how and when to use the Beans List
  - Create and use Quick Forms
4. Create Re-Usable JavaBeans using VisualAge for Java
  - Use the BeanInfo Page to create and modify Java Bean features (properties, events, methods) and be aware of what code is generated in the class and its corresponding BeanInfo class
  - From the BeanInfo Page, create new Event Sets and Listeners, know what methods are generated, and be able to make use of them
  - Create Property features using the various attributes a property can have (e.g. bound, constrained, expert, etc.) and be able to make use of them
  - Set and use Property Editors and Bean Customizers
5. Develop Java-based Solutions Using VisualAge for Java
  - Write and modify Java code using the editors and editing aids provided by the IDE
  - Understand purpose of various Smartguides and be able to make use of them
  - Make use of IDE features which aid Internationalization
  - Import and export source code, resources, class files, and repository files
  - Execute and Test Applets, Applications and Servlets from within the VisualAge for Java Environment
  - Set the classpath in VisualAge for Java with each of the available techniques and explain the advantages and disadvantages of each technique
  - Use the debugger to set and modify breakpoints, step through code, inspect variables, change the value of variables, etc.
  - Use the WebSphere Test Environment, Servlet Launcher, and JSP Monitor to execute and test servlets and JSPs
  - Create Packages, Projects, Classes, Interfaces, methods, and fields
  - Identify and resolve Java code errors, using facilities of the IDE
6. Use the Code Management Facilities of VisualAge for Java
  - Access and manage repositories
  - Implement version control for the different types of program elements and use the 'compare' and 'replace with' functions of the IDE
  - Understand the difference between the repository and the workspace

<b>Test Number</b>	<b>Test Objectives</b>
<b>Test 282 (cont'd.)</b>	<ol style="list-style-type: none"> <li>7. Use Features of IBM VisualAge for Java to Improve Development Productivity <ul style="list-style-type: none"> <li>• Use and understand purpose of Console Window</li> <li>• Identify and distinguish visual cues and clues</li> <li>• Use the IDE's browsers to navigate and find information by making use of the features of the IDE such as bookmarks and search functions, as well as the different pages of each of the browsers</li> <li>• Change the properties of browsers to display desired information</li> <li>• Change and save the properties, settings, and options associated with the workspace</li> <li>• Use the Quick Start Window</li> </ul> </li> </ol>
<b>Test 310-023 (or 310-022)</b>	<p><b>Sun Certified Java™ Programmer for JDK 1.1</b> Refer to the Web site: <a href="http://suned.sun.com/usa/cert_progs.html">http://suned.sun.com/usa/cert_progs.html</a></p>
<b>Test 398</b>	<p><b>VisualAge Pacbase, V2.5 Test</b> Individuals who successfully complete <b>Test 398, VisualAge Pacbase, V2.5 Test</b>, will have demonstrated:</p> <ol style="list-style-type: none"> <li>1. Knowledge in product usage: <ul style="list-style-type: none"> <li>• Design and build GUI's that are well designed</li> <li>• Design and build BS Logic folders, given a set of requirements</li> <li>• Implement data modeling and Pacbase definition</li> <li>• Design and build code and test server applications</li> <li>• Organize and manage the Pacbase repository</li> </ul> </li> <li>2. Understanding of: <ul style="list-style-type: none"> <li>• The issues in process data distribution: <ul style="list-style-type: none"> <li>• The options and constraints for middleware when using Pacbase for Application Development</li> <li>• The methodologies that are used for C/S Applications -- Business Process, Data, Objects, etc. -- and can implement the results of this analysis using Pacbase</li> </ul> </li> <li>• The functions and features of the VisualAge Pacbase visual programming model</li> <li>• Basic object-oriented principles (e.g., inheritance, polymorphism, etc.)</li> </ul> </li> </ol>
<b>Test 482</b>	<p><b>Enterprise Connectivity</b> Individuals who successfully complete <b>Test 482, Enterprise Connectivity</b>, will have demonstrated knowledge in and/or the ability to implement:</p> <ol style="list-style-type: none"> <li>1. Selected distributed computing Java technologies</li> <li>2. Application security restrictions</li> <li>3. Java Database Connectivity (JDBC) applets/applications</li> <li>4. Java Remote Method Invocation (RMI)</li> <li>5. Object serialization to create persistent storage of objects</li> <li>6. Distributed applications with Common Object Request Broker Architecture (CORBA)</li> <li>7. Enterprise JavaBeans (EJB)</li> <li>8. Java Servlet API</li> </ol>
<b>Test 492</b>	<p><b>IBM WebSphere Application Server, Standard Edition, V2, Test</b> Individuals who successfully complete <b>Test 492, IBM WebSphere Application Server, Standard Edition, V2, Test</b> will have demonstrated knowledge in:</p> <ol style="list-style-type: none"> <li>1. The IBM WebSphere Application Server architecture</li> <li>2. Installation and configuration of the IBM WebSphere Application Server</li> <li>3. The usage of the JSP specification to build a Web site</li> <li>4. Development, design, deployment and debugging of Java Servlets which use JavaBeans</li> <li>5. The implications of multithreaded programming practices</li> <li>6. The use and implementation of HTTP sessions</li> <li>7. Creation and debugging of JSPs</li> <li>8. The proper use of Cookies</li> <li>9. Access databases using database beans and the IBM WebSphere Application Server Connection Manager</li> <li>10. The implementation of servlet chaining in the IBM WebSphere Application Server</li> <li>11. The proper use of redirection to handle error conditions</li> <li>12. IBM WebSphere specific APIs (i.e., User Profile, Connection Manager)</li> <li>13. Basic knowledge of XML</li> <li>14. Basic knowledge of HTML including forms</li> </ol>

<b>Test Number</b>	<b>Test Objectives</b>
<b>Test 493</b>	<p><b>IBM Websphere Studio, V3</b></p> <ol style="list-style-type: none"> <li>1. Requirements and Planning <ul style="list-style-type: none"> <li>A. Gains understanding of requirements</li> <li>B. Identifies the target audience</li> <li>C. Reviews specifications</li> <li>D. Ensures that requirements are being met on an ongoing basis</li> <li>E. Interacts with the architect during the course of the development life cycle</li> <li>F. Interacts with the client during the course of the development life cycle</li> <li>G. Identifies roles and responsibilities of the individuals needed for the development team</li> <li>H. Understands the web development life cycle</li> <li>I. Use tool options and administrative settings</li> </ul> </li> <li>2. Site Design <ul style="list-style-type: none"> <li>A. Weighs different solutions with respect to performance vs. functionality (e.g., servlets, image size, etc.)</li> <li>B. Understands the performance implications for static and dynamic HTML pages</li> <li>C. Defines the purpose that the graphics serve and the style of the site</li> <li>D. Makes proper design decisions based on understanding of the compatibility issues</li> <li>E. Provides design recommendations (e.g., related to security, usability, audience reach)</li> <li>F. Creates the "look and feel" of the site</li> </ul> </li> <li>3. Web Content Creation <ul style="list-style-type: none"> <li>A. Creates and generates HTML pages which includes use of tables, frames, links, forms, images and other misc. content</li> <li>B. Writes Text (Words)</li> <li>C. Understands JavaScript, Static, &amp; Dynamic HTML</li> <li>D. Creates Graphics/Media</li> <li>E. Implements indexing capabilities of the web site</li> <li>F. Creates Applets that conform to security restrictions using visual tools</li> <li>G. Creates Servlets using visual tools</li> <li>H. Generates and uses JavaBeans with the Applet designer (does not write Java)</li> <li>I. Utilizes the Java console for problem determination</li> <li>J. Generates SQL queries, JavaBeans, and JSP using wizards</li> </ul> </li> <li>4. Web Content Assembly <ul style="list-style-type: none"> <li>A. Establishes version control</li> <li>B. Identifies and uses appropriate web image formats</li> <li>C. Understands the JSP 1.0 tag language and uses the language visually (e.g., BEAN tag, INSERT tag)</li> <li>D. Optimizes image files for display on-line</li> <li>E. Integrates Java applets, servlets and beans with HTML</li> <li>F. Works with existing site information via imports, exports and archives</li> </ul> </li> <li>5. Web Solution Publishing/Staging <ul style="list-style-type: none"> <li>A. Deploys HTML, Java applets, etc. to the web server</li> <li>B. Publishes to staging/production servers</li> <li>C. Considers issues associated with site staging</li> <li>D. Maintains site as needed</li> </ul> </li> </ol>
<b>Test 494</b>	<p><b>IBM WebSphere Application Server, Standard Edition V3</b></p> <ol style="list-style-type: none"> <li>1. Overall Application Design <ul style="list-style-type: none"> <li>A. Determines the mechanism for managing client-specific state (e.g., Cookies, URL rewriting, hidden tags, HTTP sessions, etc.)</li> <li>B. Designs a layered solution from a given multi-tiered architecture</li> <li>C. Designs and develops a solution to manage the decoupling of model from presentation</li> <li>D. Designs and develops model persistence using JDBC</li> </ul> </li> <li>2. Controller Development <ul style="list-style-type: none"> <li>A. Designs and develops Java Servlets conforming to the JSDK 2.1 or JSWDC X Specification</li> <li>B. Builds thread-safe, multi-user server-side programs</li> <li>C. Uses HttpSession objects to manage client-specific data on the server</li> <li>D. Knows when and how to use Cookies appropriately</li> <li>E. Knows when and how to use Security APIs appropriately</li> <li>F. Writes code to handle error conditions</li> <li>G. Builds and uses Java components to communicate between application layers (e.g., JavaBeans)</li> <li>H. Examines HttpServletRequest objects in order to process client requests</li> <li>I. Sets properties of the HttpServletResponse and HttpServletRequest objects for controlling presentation content and application behavior</li> </ul> </li> <li>3. Presentation Development <ul style="list-style-type: none"> <li>A. Modifies/constructs Web pages, to provide dynamic content using JSP</li> <li>B. Understands the JSP 1.0 Specification</li> </ul> </li> </ol>

<b>Test Number</b>	<b>Test Objectives</b>
<b>Test 494 (cont'd)</b>	<ol style="list-style-type: none"> <li>4. Configuration/Deployment               <ol style="list-style-type: none"> <li>A. Knows IBM WebSphere Application Server architecture and terminology (e.g., startup sequence, what is plugin, admin server, managed servers, property storage, etc.)</li> <li>B. Installs and configures the IBM WebSphere Application Server</li> <li>C. Uses the Resource Analyzer tool to monitor performance and behavior of web applications</li> <li>D. Defines and/or configures Application servers, Virtual Hosts, Web Applications, Web Resources, load-by-classname (invoker servlet), file server servlet, JDBC drivers, JSP enablers, Datasources, named servlets, Servlet Engines, and Web Paths</li> <li>E. Configures Session Manager options</li> <li>F. Uses tasks, Types, and Topology configuration pages in the Administrative Console</li> <li>G. Starts, stops, and restarts Application Servers, Web Applications, and Servlet Engines</li> </ol> </li> <li>5. Troubleshooting               <ol style="list-style-type: none"> <li>A. Directs application and AdminServer trace outputs</li> <li>B. Interprets trace and log files to locate and solve problems</li> <li>C. Familiarity with tracing and debugging facilities</li> <li>D. Identifies and resolves concurrent programming issues</li> <li>E. Identifies misbehaving servlets and JSPs</li> <li>F. Identifies performance tuning opportunities</li> </ol> </li> </ol>
<b>Test 495</b>	<p><b>IBM WebSphere Application Server, Advanced Edition, V3, Test Objectives</b></p> <ol style="list-style-type: none"> <li>1. Application / Component Design           <ol style="list-style-type: none"> <li>A. Designs and develops a solution that decouples model from presentation*</li> <li>B. Identifies appropriate Enterprise JavaBean (EJB) type to solve a given business problem</li> <li>C. Uses appropriate design patterns to encapsulate enterprise services in an EJB application</li> </ol> </li> <li>2. Web Component Development and Testing           <ol style="list-style-type: none"> <li>A. Designs and develops Java Servlets conforming to the JSDK 2.1 Specification**</li> <li>B. Builds and tests server-side logic which is thread-safe in a concurrent web application environment**</li> <li>C. Manages end-user state using HttpSession and cookies**</li> <li>D. Implements robust controller logic within a framework which supports effective error handling**</li> <li>E. Uses methods of HttpServletRequest and HttpServletResponse to interact with HTTP data streams**</li> <li>F. Modifies/constructs Web pages to provide dynamic content using JSP 1.0**</li> </ol> </li> <li>3. Enterprise JavaBean (EJB) Development and Testing           <ol style="list-style-type: none"> <li>A. Implements stateful/stateless Session Beans</li> <li>B. Implements container managed persistence (CMP) Entity Beans</li> <li>C. Implements bean managed persistence (BMP) Entity Beans</li> <li>D. Uses EJBContext to coordinate with the EJB container</li> <li>E. Uses client proxy to interface with EJBs</li> <li>F. Uses Java Transaction API (JTA) to control transaction demarcation</li> <li>G. Understands and works with Java Enterprise APIs to connect to EJBs</li> </ol> </li> <li>4. Development and Testing of Applications with VisualAge for Java, Enterprise Edition, V3           <ol style="list-style-type: none"> <li>A. Uses the WebSphere Test Environment to test web applications within VisualAge for Java</li> <li>B. Uses VisualAge persistence to map CMP fields to existing database schemas</li> <li>C. Uses VisualAge EJB test client to unit test EJBs</li> <li>D. Uses EJB Development Environment in VisualAge for Java</li> <li>E. Selects and uses appropriate Access Bean(s) in order to provide client access to EJBs</li> </ol> </li> <li>5. Configuration, Deployment, and Management of Applications           <ol style="list-style-type: none"> <li>A. Manipulates transactional behavior of EJBs (e.g., isolation levels, transaction attribute)</li> <li>B. Declares security policies on enterprise applications</li> <li>C. Uses WebSphere Administrative Console and related property files to configure and deploy an application</li> <li>D. Configures HttpSession management options*</li> <li>E. Configures multi-node applications using Servlet Redirector and application server models/clones</li> <li>F. Uses the resource analyzer tool to identify performance tuning opportunities*, connection pooling characteristics, etc.*</li> <li>G. Uses WebSphere trace facilities and log files to debug Application Server and Admin Server problems*</li> <li>H. Identifies misbehaving servlets, * JSPs, * and EJBs</li> <li>I. Configures workload management selection policies</li> </ol> </li> </ol>



---

**Test Number****Test Objectives**

---

**Test N2228/N3227****VisualAge for Java, Enterprise Edition, V2 Practicum**

Individuals who successfully complete **Test N2228/N3227, VisualAge for Java, Enterprise Edition, V2.0 Practicum** will have participated as an effective member of a team and will have demonstrated skills in:

1. Validating customer project requirements, scoping application functionality, and documenting these in a Statement of Work
  2. Identifying and developing “use cases” and consolidating them into a Use Case model
  3. Applying the Unified Modeling Language (UML) to derive an object model for a given business domain
  4. Designing components that have well-defined interfaces and fit into a layered architecture
  5. Implementing the application using VisualAge for Java and publishing parts of the resulting solution on a Web server.
  6. Managing a project, including building a project plan, defining and allocating tasks, and delivering a functional application that fulfills the commitments in the Statement of Work
  7. Maintaining and actively exercising all channels of communications with both the customer and the team by:
    - Providing evaluation and feedback to other team members
    - Identifying the strengths and weaknesses of team members
    - Actively listening
    - Questioning techniques
    - Setting team goals and schedules
    - Studying dependencies and gating factors to reach goals and schedules
    - Clearly discussing developmental goals/assignments
    - Participating in skills transfer among team members
-

# Important Program Information

## Test Fees, Registration and Administration

The test fee for your region is available from the Test Registration Center.

To register for a test, refer to Test Registration Centers and call the center nearest you. Please note the following:

All certification tests, except for the **Practicum** tests may be taken at any time. All the tests, except for the **Practicum** tests, are administered worldwide through Sylvan Prometric. Except for **Tests 310-022, 310-023, 310-025, 310-500, 310-520, 120-501 and Test 120-503**, tests are also administered through the IBM Assessment and Certification Services in Europe and some other parts of the world.

**Practicum** tests are administered through IBM Learning Services.

Note: All IBM owned tests contain the following privacy notification. If you do not agree with the transmission and use of your demographic data and test results, you will not be able to take the test.

The owner of this test is IBM. IBM, its test delivery vendor and most of the companies with which IBM has a business relationship, are international companies, operational worldwide.

On behalf of IBM, the test delivery vendor gathers your demographic data and test results. From your registration and testing site, your demographic data and test results are transmitted electronically by this test delivery vendor to its central certification database, which may be located in another country. The test delivery vendor then transmits your demographic data and test results electronically to IBM and/or the companies with which IBM has a business relationship, which may also be located in another country.

Worldwide personnel, from IBM, the test delivery vendor, and the companies with which IBM has a business relationship, have controlled access to your demographic data and test results.

Your demographic data and test results will be used to process your certification and to determine the performance of the test questions. Your information may also be used by IBM and possibly the companies with which IBM has a business relationship for subsequent marketing communications.

Considering the information provided above, select ONE of the following:

- A. I agree with the transmission and use of my demographic data and test results as set forth above. I will take the test.
- B. I DO NOT agree with the transmission and use of my demographic data and test results. I will NOT take the test.

If you have any questions, please contact IBM at [certad@ca.ibm.com](mailto:certad@ca.ibm.com)

## Certification Processing

When you take a test, your results are immediately calculated and you are given an **Examination Score Report** before you leave the testing room. With the exception of **Note 1** below, your test results and demographic data are sent from the test delivery vendor (e.g. Sylvan Prometric, IBM Assessment and Certification Services) to IBM for processing. When you have taken all the tests required for a certification role, your **Certification Welcome Package** containing your certificate will be mailed to you. This package will also visibly contain the **IBM Certification Agreement**. Upon opening the package, it means you agree to comply with the **Agreement**. To view the **Agreement**, refer to <http://www.ibm.com/education/certify/process/agreement.phtml>.

If you have an inquiry or comment, please submit it via the **Feedback** button on our Web site, <http://www.ibm.com/software/ad/certify/>.

### Note:

1. **Tests 310-022, 310-023, 310-025, 310-500, 120-501** are owned by Sun Microsystems. For these tests, the test delivery vendor **does not** send your results to IBM. For IBM to give you credit for these tests, you need to fax your **Examination Score Report** to (512) 838-7961 (to the USA), or mail it to:

Professional Certification Program from IBM  
IBM Corporation  
11400 Burnet Road, Mail Drop 3013  
Austin, Texas 78758  
USA

# Test Registration Centers

## Sylvan Prometric



Canada and U.S.:	1-800-959-3926
Australia:	61.2.9414.3663 or 1-800-806-944
Austria:	0800-8582
Belgium:	0800-1-7414
Brazil:	000-817-965-5340
China:	10800-610-0036
Eastern Europe:	31(0)320-239895
France:	33(0)1.4289.3122
Germany:	0130-839708
Guam:	1888-249-6392
Hong Kong:	800-96-8444
Indonesia:	001-803-61608
Ireland:	1-800-626-104
Italy:	1768-78441
Japan:	0120-387737
Latin America:	001.612.820.5200
Malaysia:	1-800-80-0508
Mexico:	95-800-332-1034
Middle East:	44(0)181.607.3850
Netherlands:	0800-022-75-84
New Zealand:	0800-44-1689
North Africa:	31(0)320-239892
Phillippines:	1-800-1-611-0126
Portugal:	31(0)320-239898
Scandinavia:	44(0)181-607-3850
Singapore:	800-616-1132
South Africa:	44(0)181.607.3850
South Korea:	007-8611-3095
Spain:	31(0)320-239898
Switzerland:	0800-556-966
Taiwan:	008-061-1141
Thailand:	001-800-611-2401
U.K.:	0800-592-873

## Internet

Professional Certification Program from IBM:  
<http://www.ibm.com/certify/>

IBM Application Development Certification:  
<http://www.ibm.com/software/ad/certify/>

IBM Learning Services:  
<http://www.training.ibm.com/ibmedu/>

IBM Direct Publications Catalog:  
<http://www.elink.ibm.com/pbl/pbl>

## IBM Assessment and Certification Services

Canada and U.S.:	1-800-959-3926
Australia:	1-800-801-088
Austria:	43(0)1-211-45 Ext. 6140
Barcelona:	34(0)3-401-8652
Belgium:	32(0)2-655-5218
China:	86 (021) 6280-1070 x2168
Denmark:	(+45) 45 23 30 00
Finland:	358(9)459-4444
France:	33(0)1-4914-4000
Lyon	33(0)72-29-40-13
Marseille	33(0)91-22-43-84
Montpellier	33(0)67-34-42-48
Nantes:	33(0)40-41-43-91
Germany:	49(0)211-476-1403
Greece:	30(0)1-995-3302
Hong Kong:	852-2825-0010
Ireland:	01-353-16619066
Italy:	39(0)1-67-017-001
Netherlands:	31(0)20513-3940
Norway:	47(0)6699-8299
South Africa:	27-11-302-6655
Spain:	34(0)1-397-6220
Sweden:	46(0)879-34-408
Switzerland:	41(0)1-643-69-69
Taiwan:	886(02)719-3299
Turkey:	90(0)212-280-0900
United Kingdom:	44(0)345-62-60-31

## IBM Learning Services

Canada and U.S.: 1-800-IBM-TEACH  
(1-800-426-8322)

Outside Canada and the U.S., call your local IBM office.

## Inquiries or Comments

Please submit your inquiries or comments via the **Feedback** button on our Web site, <http://www.ibm.com/certify/>.



© International Business Machines Corporation 2000

Printed in the U.S.A.

03/2000

All Rights Reserved

© IBM, DB2, VisualAge, and WebSphere are trademarks or registered trademarks of International Business Machines Corporation

Java and Java Beans are trademarks of Sun Microsystems, Inc.

Windows is a trademark of Microsoft Corporation.

XML is a registered trademark of MIT in the USA.

All other trademarks are properties of their respective owners.

---