

Developing Applications in IBM Business Process Manager Advanced V8.5.7 - I

WB860 (Classroom)

ZB860 (Self-paced)

Course description

This course teaches you how to use the tools in IBM Business Process Manager Advanced V8.5.7 to build and deploy process integration solutions.   
  
IBM Process Server supports a service-oriented architecture (SOA) by providing a platform for using diverse technologies to integrate business applications. In this course, you learn how IBM Process Server enables business integration applications to define business logic and processes based on Web Services Business Process Execution Language (WS-BPEL), and business rules. In the intensive hands-on lab exercises, you design, develop, and test a comprehensive business integration solution. You use the IBM Integration Designer tool to create business integration solutions by using the Service Component Architecture (SCA) programming model, the Service Data Objects (SDO) data model, and the mediation flow programming model.  
  
The lab environment for this course uses the Windows Server 2012 R2 64-bit platform.

For information about other related courses, see the IBM Training website:

http://www.ibm.com/training

General information

Delivery method

Classroom or self-paced virtual classroom (SPVC)

Course level

ERC 1.2

Product and version

IBM Business Process Manager V8.5.7

Audience

This course is designed for system administrators, integration specialists, application developers, business process developers, support engineers, and technical sales and marketing professionals.

Learning objectives

After completing this course, you should be able to:

* Describe the purpose and business value of a service-oriented architecture
* Describe the purpose and business value of the tools included in IBM Business Process Manager Advanced V8.5.7: IBM Process Designer, IBM Integration Designer, IBM Process Server, IBM Process Center, IBM Process Portal, and Business Space
* Identify and describe the features that are available in IBM Process Designer, IBM Integration Designer, and the Service Component Architecture
* Describe the structure of modules and libraries
* Create business objects, shared interfaces, and business calendars
* Model a complex business process diagram in IBM Process Designer
* Create a complex business process that includes basic and structured WS-BPEL activities in IBM Integration Designer
* Use SCA bindings to communicate with web services
* Use WebSphere Java EE Connector Architecture (JCA) adapters in applications
* Implement data maps to transform business data
* Implement mediation modules to route and transform messages
* Implement business rules and use the Business Rules Manager web client to interact with business rules at run time
* Create a business space by using widgets and templates that are available for IBM Business Process Manager Advanced V8.5.7
* Create and run component test projects in IBM Integration Designer
* Bring the UTE Process Server online and connect with the Process Center
* Explore the IBM Process Center repository
* Create and implement an Advanced Integration service (AIS) in IBM Process Designer and IBM Integration Designer

Prerequisites

Before taking this course, you should have:

* Basic Java and Java Platform, Enterprise Edition (Java EE) skills
* Basic Extensible Markup Language (XML) skills

Successful completion of course WB819, *Process Implementing with IBM Business Process Manager Standard/Adv V8.5.6 - I*, is highly recommended, but not required.

Duration

5 days

Skill level

Basic

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| Classroom (ILT) setup requirements | |
| Processor | Intel i7-3630QM processor or faster |
| GB RAM | 16 |
| GB free disk space | 120 available (not total disk space) |
| Network requirements | None |
| Other requirements | None |

Notes

The following unit and exercise durations are estimates, and might not reflect every class experience. If the course is customized or abbreviated, the duration of unchanged units will probably increase.

This course is an update of the following previous course:

* WB859: *Developing Applications in IBM Business Process Manager Advanced V8.5.6 - I*

Course agenda

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| Course introduction  Duration: 15 minutes |

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| Unit 1. Introduction to IBM Business Process Manager V8.5.7  Duration: 1 hour | |
| Overview | In this unit, you learn about the purpose, function, and business value of SOA, and apply SOA principles to business process management (BPM). The unit introduces the tools that are included with IBM Business Process Manager V8.5.7 Advanced edition. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the concepts of business processes and business process management (BPM) * Describe the IBM product editions |

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| Unit 2. Overview of IBM Business Process Manager Advanced V8.5.7  Duration: 1 hour | |
| Overview | This unit is an overview of IBM BPM Advanced 8.5.7.You learn its key capabilities and when to use the IBM BPM Advanced product. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the differences between BPMN and BPEL * Explain when to use the IBM BPM Advanced product * Describe the capabilities of IBM Business Process Manager V8.5.7 |

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| Exercise 1. Exploring IBM Process Designer and IBM Process Portal  Duration: 1 hour and 30 minutes | |
| Overview | This exercise introduces the IBM Process Designer development environment. It shows you some of the tools that are associated with creating, editing, and managing process applications. It also introduces the collaboration capabilities of IBM Process Portal. |
| Learning objectives | After completing this exercise, you should be able to:   * Start IBM Process Designer * Open a business process activity in IBM Process Designer * Explore a business process in IBM Process Designer * Use the Playback feature to examine a running business process in IBM Process Designer Inspector * Use a coach to work with a running business process * Wire activities together in a business process * Start IBM Process Portal and explore its collaboration capabilities |

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| Unit 3. Course business scenario: What you build  Duration: 1 hour | |
| Overview | This unit describes the lab scenario and lists the components that you build in each lab exercise of this course. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the key components that you build and assemble in this course * Explain the benefits of each lab exercise in this course |

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| Unit 4. IBM Integration Designer overview  Duration: 1 hour and 15 minutes | |
| Overview | In this unit, you learn about the IBM Integration Development environment and how it relates to other IBM Business Process Manager V8.5.7 tools, such as IBM Process Designer and IBM Process Server. The unit also explains how to use the features of IBM Integration Designer. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the purpose and business value of IBM Integration Designer * Define the types of projects that are developed in IBM Integration Designer: modules, mediation modules, and libraries * Describe how to create and deploy applications in IBM Integration Designer |

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| Exercise 2. Exploring IBM Integration Designer, part I  Duration: 45 minutes | |
| Overview | This exercise introduces the IBM Integration Designer Eclipse-based development environment. It shows you the components in business integration projects, graphical editors, documentation capabilities, and the Task Flows view. It also explores the preferences, capabilities, product help, and product update features of the tool. |
| Learning objectives | After completing this exercise, you should be able to:   * Describe IBM Integration Designer capabilities and preferences * Use the help menu to search for assistance * Use the Installation Manager to find product updates * Browse the Business Integration perspective and views * Examine the modules and libraries of a business integration project * Browse the IBM Integration Designer graphical editors * Use the IBM Integration Designer documentation capabilities * Use the Task Flows view |

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| Unit 5. Service Component Architecture overview  Duration: 1 hour | |
| Overview | In this unit, you learn about the service component architecture (SCA), its constituent components, and its relevance to SOA, BPM, and IBM Integration Designer. |
| Learning objectives | After completing this unit, you should be able to:   * Identify the purpose and business value of using SCA * Identify and explain the function of the individual parts of an SCA component * Define the concept of a service module and explain each of the service module components * Describe how to test SCA applications in IBM Integration Designer * Describe the features that are available in the IBM Integration Designer test environment |

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| Exercise 3. Exploring IBM Integration Designer, part II  Duration: 45 minutes | |
| Overview | In this exercise, you use the IBM Integration Designer environment to explore various SCA components and examine them in the test environment. |
| Learning objectives | After completing this exercise, you should be able to:   * Assemble an SCA application * Examine project components * Explore staging projects * Use the IBM Integration Designer test environment * Enable cross-component tracing to examine a business process in testing * Deploy a library globally |

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| Unit 6. SCA bindings  Duration: 1 hour | |
| Overview | This unit teaches you about SCA components and their bindings. You also learn how to use and implement web services in the SCA framework, specifically with IBM Integration Designer. |
| Learning objectives | After completing this unit, you should be able to:   * List the various types of SCA import and export bindings * Describe how SCA bindings facilitate integration with different types of applications * Describe how web services are used in the Service Component Architecture framework |

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| Exercise 4. Working with web services  Duration: 1 hour | |
| Overview | This exercise demonstrates two methods for working with web services in IBM Integration Designer. First, you import an external Web Service Description Language (WSDL) file given to you by a third party. You use this interface file to integrate a web service into your application by using IBM Integration Designer. After importing the WSDL file, you test the web service. Second, you use a web service export to expose an existing IBM Process Server application. You then use the SCA programming framework to call the export. |
| Learning objectives | After completing this exercise, you should be able to:   * Import an external Web Services Description Language (WSDL) file into IBM Integration Designer * Create an SCA component from a web service interface file * Use the integrated test client to test a web service * Use a web service export to expose an existing IBM Process Server application |

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| Unit 7. Business objects  Duration: 45 minutes | |
| Overview | This unit explains the Service Data Objects (SDO) architecture and framework, and how SDO is used in a solution. |
| Learning objectives | After completing this unit, you should be able to:   * Identify the purpose and advantages of using the SDO framework * Define the data object and data graph components of the SDO framework * Identify the purpose and advantages of using the business object framework * Define the business object and business graph components of the business object framework |

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| Exercise 5. Creating business objects and shared interfaces  Duration: 45 minutes | |
| Overview | In this exercise, you create business objects and interfaces that the components use in your end-to-end solution. These artifacts are created in a library for use by multiple modules. |
| Learning objectives | After completing this exercise, you should be able to:   * Compare business objects between IBM Process Designer and IBM Integration Designer * Implement business objects and define their elements * Implement interfaces that use business objects as inputs and outputs |

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| Unit 8. Business process choreography overview  Duration: 1 hour and 15 minutes | |
| Overview | This unit introduces you to Business Process Execution Language (BPEL) and business process development that uses Business Process Choreographer (BPC). |
| Learning objectives | After completing this unit, you should be able to:   * Describe the purpose and business value of using the WS-BPEL standard * Describe the function of the business process container * Describe the difference between long-running and microflow (short-running) business processes * List and describe the seven parts of a business process |

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| Exercise 6. Creating a business process, part I  Duration: 1 hour | |
| Overview | In this exercise, you use IBM Integration Designer to begin creating a complex business process. You create a long-running business process, process variables, interface partners, and reference partners. |
| Learning objectives | After completing this exercise, you should be able to:   * Create a business process * Implement WS-BPEL interface partners and reference partners * Create process variables * Compare business processes between IBM Integration Designer and IBM Process Designer |

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| Unit 9. Business process basic and structured activities  Duration: 1 hour | |
| Overview | This unit describes the various types of activities in BPEL, including basic and structured activities. |
| Learning objectives | After completing this unit, you should be able to:   * List and describe the basic activities for business processes * Define each of the available structured activities for business processes |

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| Exercise 7. Creating a business process, part II  Duration: 1 hour | |
| Overview | In this exercise, you use IBM Integration Designer to implement a complex WS-BPEL business process. You use a combination of simple and structured activities to choreograph the service invocations that are designed to implement the account verification process. |
| Learning objectives | After completing this exercise, you should be able to:   * Implement basic BPEL activities in a business process * Implement structured activities in a business process * Compare the BPEL to the BPD in IBM Process Designer |

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| Unit 10. Business process handlers, runtime behavior, and clients  Duration: 1 hour and 15 minutes | |
| Overview | This unit describes the various types of activities in BPEL, including basic and structured activities. |
| Learning objectives | After completing this unit, you should be able to:   * List and describe the available handlers and error-processing activities * Describe the runtime behavior of business processes * Describe the administrative options and types of client access that are available for business processes |

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| Exercise 8. Creating a business process, part III  Duration: 1 hour | |
| Overview | In this exercise, you use IBM Integration Designer to finish building a complex BPEL business process. You use data maps to transform data, and you implement services that the process invokes. After completing the process, you add the business process to an SCA assembly diagram and test it. |
| Learning objectives | After completing this exercise, you should be able to:   * Use data maps to transform process data * Use context variables to create a runtime process description * Assemble an SCA application that contains a business process * Test a business process in the IBM Integration Designer test environment |

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| Unit 11. Business rules  Duration: 1 hour | |
| Overview | This unit describes the purpose and function of business rules as an SCA component in IBM Process Server. |
| Learning objectives | After completing this unit, you should be able to:   * Define the purpose and business value of using business rules * Describe the function of a rule group and list the rule group components * Define the concepts of rule sets and decision tables * Describe the runtime behavior of a rule group component * Identify the IBM Process Server administrative capabilities for importing, exporting, and auditing business rule changes in the runtime environment |

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| Exercise 9. Creating business rules  Duration: 1 hour | |
| Overview | In this exercise, you create rule sets and decision tables that contain business rules. You create a rule group component, incorporate the rule group component in an assembly diagram, and test it. Finally, you use the Business Rules Manager web client to interact with business rules at run time. |
| Learning objectives | After completing this exercise, you should be able to:   * Create rule sets and decision tables that contain business rules * Create a rule group component * Incorporate a rule group component in an assembly diagram * Test a business rule group in the integrated test client * Use the Business Rule Manager web client to interact with business rules at run time |

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| Unit 12. Adapters  Duration: 45 minutes | |
| Overview | In this unit, you learn about WebSphere (JCA) adapters and how they are used to integrate solutions with other applications. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the purpose and business value of using adapters in applications * Describe the capabilities of WebSphere (JCA) adapters * List the advantages of using the JCA architecture for WebSphere Adapters * Describe how to use the External Service wizard for WebSphere Adapters |

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| Exercise 10. Implementing WebSphere (JCA) adapters  Duration: 1 hour | |
| Overview | In this exercise, you configure a WebSphere adapter as part of a business process solution. |
| Learning objectives | After completing this exercise, you should be able to:   * Configure the WebSphere Adapter for Flat Files * Use the external service tool to generate artifacts that are used in an application * Incorporate adapter-related SCA artifacts in an assembly diagram * Test an adapter in the IBM Integration Designer test environment |

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| Unit 13. Developing mediation services  Duration: 1 hour | |
| Overview | This unit covers mediation services, mediation modules, and service message objects (SMOs) in IBM Process Server. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the role of mediation services in IBM Process Server * Define the concept of mediation modules * Describe how to create mediation flows in IBM Integration Designer * Describe the role of SMOs in mediations * Explain the structure of SMOs |

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| Exercise 11. Creating mediation services, part I  Duration: 1 hour | |
| Overview | In this exercise, you create a mediation module and build a simple XML data map. |
| Learning objectives | After completing this exercise, you should be able to:   * Create a mediation module that contains a Mapping primitive * Define an XML data map * Test a mediation module that contains a Mapping primitive |

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| Unit 14. Mediation primitives  Duration: 45 minutes | |
| Overview | This unit explores the various mediation primitives that are used in mediation flows. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the role of mediation primitives in mediation flows * Describe the prebuilt mediation primitives that are available for mediation flows |

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| Exercise 12. Creating mediation services, part II  Duration: 1 hour and 30 minutes | |
| Overview | In this exercise, you use a message filter primitive to implement a mediation module that routes messages. |
| Learning objectives | After completing this exercise, you should be able to:   * Create a mediation module that contains a message filter mediation primitive and a Mapping primitive * Define an XML data map * Test a mediation module that contains a message filter mediation primitive and a Mapping primitive |

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| Unit 15. Business Space  Duration: 1 hour | |
| Overview | This unit explains the business value of Business Space and describes how you can use it to interact with content from products in the business process management portfolio. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the purpose and business value of Business Space * Describe the types of widgets that are available in Business Space * Describe the types of templates that are available in Business Space * Explain how to create and configure a new space in Business Space |

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| Exercise 13. Exploring Business Space  Duration: 1 hour and 30 minutes | |
| Overview | In this exercise, you explore the capabilities of Business Space by using templates, pages, and widgets. |
| Learning objectives | After completing this exercise, you should be able to:   * Create a space by using the Business Space client * Use the Business Space client to work with human tasks * Create a page and display content by using widgets and Business Space templates |

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| Unit 16. Advanced testing  Duration: 1 hour | |
| Overview | This unit describes the testing features that are available in IBM Integration Designer. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the advanced testing facilities that are available in IBM Integration Designer, including the Component Test Explorer and cross-component trace * Describe the integration debugger * Define the purpose and function of the serviceDeploy tool * Describe how to use serviceDeploy in single-developer and multiple-developer environments |

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| Exercise 14. Using component tests  Duration: 1 hour | |
| Overview | In this exercise, you use component tests to test applications. You also use cross-component tracing to inspect SCA components. |
| Learning objectives | After completing this exercise, you should be able to:   * Create a component test project with an operation-level test case * Create a component test project with a scenario-based test case * Run component test project test suites in the IBM Integration Designer integrated test environment |

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| Unit 17. IBM Process Center  Duration: 1 hour | |
| Overview | This unit teaches you how to use IBM Process Center to deploy, test, and manage applications. |
| Learning objectives | After completing this unit, you should be able to:   * Describe the purpose and business value of IBM Process Center * Define the components of IBM Process Center * Describe how to use the IBM Process Center Console to deploy, test, and manage IBM BPM applications |

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| Exercise 15. Bringing the UTE Process Server online  Duration: 1 hour and 30 minutes | |
| Overview | In this exercise, you bring the UTE Process Server online and connect with Process Center. |
| Learning objectives | After completing this exercise, you should be able to:   * Verify the status of the connected Process Server * Run wsadmin commands for environment configuration * Exchange SSL certificates between Process Center and Process Server |

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| Exercise 16. Exploring IBM Process Center  Duration: 1 hour and 30 minutes | |
| Overview | In this exercise, you use the IBM Process Center repository to manage your applications. |
| Learning objectives | After completing this exercise, you should be able to:   * Explore the IBM Process Center repository * Create a toolkit in IBM Process Center * Associate IBM Integration Designer artifacts with the toolkit * Generate access to process applications and toolkits * Archive and delete process applications |

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| Unit 18. Advanced Integration services  Duration: 30 minutes | |
| Overview | This unit is an overview of Advanced Integration services. |
| Learning objectives | After completing this unit, you should be able to:   * Explain Advanced Integration services (AIS) * Describe the business value of AIS * Describe the steps to create an AIS |

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| Exercise 17. Implementing Advanced Integration services  Duration: 1 hour and 30 minutes | |
| Overview | In this exercise, you create an Advanced Integration service that is used by IBM Process Designer to invoke IBM Integration Designer implementations. |
| Learning objectives | After completing this exercise, you should be able to:   * Create an AIS in IBM Process Designer * Implement an AIS in IBM Integration Designer * Unit test an AIS in IBM Integration Designer * Invoke a BPEL process from a coach and BPD |

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| Unit 19. Course summary  Duration: 30 minutes | |
| Overview | This unit summarizes the course and provides information for future study. |
| Learning objectives | After completing this unit, you should be able to:   * Explain how the course met its learning objectives * Access the IBM Training website * Identify other IBM Training courses that are related to this topic * Locate appropriate resources for further study |

For more information

To learn more about this course and other related offerings, and to schedule training, see **ibm.com**/training

To learn more about validating your technical skills with IBM certification, see **ibm.com**/certify

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