IBM App Connect Enterprise 12 Application Development III

WM688 (Classroom)

ZM688 (Self-paced)

Course description

This course provides instruction in using IBM App Connect Enterprise to apply advanced topics such as basic security authentication on deployed integrations, message flow monitoring to help in problem determination, and creating user-defined properties in a message flow. The first part of this course covers message flow aggregation, encrypting credentials and storing them in the IBM App Connect vault, and debugging message flows. The second half introduces dynamic features that use IBM App Connect web user Interface to Record and Replay messages, create a business transaction definition, and view various business events in a completed, failed, inconsistent, and in-progress state.

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

**ibm.com**/training

General information

Delivery method

Classroom or self-paced virtual classroom (SPVC)

Course level

ERC 1.0

Product and version

IBM App Connect Enterprise V12

Audience

This course is designed for experienced integration specialists and senior-level developers with experience in application development and messaging middleware applications that are interested in becoming an IBM App Connect Enterprise Developer.

Learning objectives

After completing this course, you should be able to:

* Develop a message flow that implements aggregation to fan-out information into a single output message.
* Configure integration nodes and integration servers to connect to secured resources by using credentials that are stored in encrypted form in an IBM App Connect Enterprise vault
* Configure an IBM App Connect vault for storing encrypted credentials, which can be used to access secured resources
* Enable user trace and retrieve the collected trace data
* Build a message flow that uses IBM App Connect Enterprise web user interface to view events and replay messages
* Create monitoring events on selected nodes so that they could be published to a topic and recorded into a database table
* Construct and configure a business transaction definition in the web user interface
* Create the business events that make up a business transaction definition
* Design an application that uses the Business Transaction Monitoring dashboard to view events in completed, failed, inconsistent, and in-progress states
* Create and add user-defined properties to a message flow
* Assemble promoted properties to provide common values for multiple message flow nodes in the flow by converging promoted properties

Prerequisites

Before taking this course, you should have taken the following courses:

* WM686: IBM App Connect Enterprise 12 Application Development I
* WM687: IBM App Connect Enterprise 12 Application Development II

Duration

2 days

Skill level

Advanced

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 courses:

* WM686: IBM App Connect Enterprise V12 Application Development I
* WM687: IBM App Connect Enterprise V12 Application Development II

Course agenda

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| Course introduction  Duration: 15 minutes |

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| Unit 1. Implementing message flow aggregation  Duration: 1 hour | |
| Overview | This unit focuses on how event-driven message processing nodes control the flow of messages through message flows by using aggregation, message collections, message sequences, and timeout flows. In this unit, you learn how to aggregate and control the sequence of messages in a message flow. In addition, you learn how to use time-sensitive nodes to control when processes run. |
| Learning objectives | After completing this unit, you should be able to:   * Explain how to aggregate messages in a message flow * Describe how to sequence and resequence messages in a message flow * Learn how to create group messages from one or more sources into a message collection * Explain how to run processes at specific times or at fixed intervals |

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| Exercise 1. Implementing message flow aggregation  Duration: 1 hour | |
| Overview | In this exercise, you configure a fan-out message flow to generate four different request messages and start the tracking of the aggregation operation. Then, you implement a customer feedback message flow by requesting customer information from a server and aggregate the replies. |
| Learning objectives | After completing this exercise, you should be able to:   * Add IBM App Connect SYSTEM.BROKER queues to a queue manager * Configure the Aggregate Control node and the Aggregate Request node to generate and concurrently fan-out related requests * Create an Aggregate Reply node to aggregate messages into a single output message |

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| Unit 2. Securing message flows  Duration: 1 hour | |
| Overview | This unit examines the security considerations in IBM App Connect and how to configure message flow security. You also learn how to implement basic authentication on incoming requests by using credentials stored locally in an independent integration server’s vault. |
| Learning objectives | After completing this unit, you should be able to:   * Identify the steps needed to implement message-level security in a message flow * Explain the differences between administration security, application security, and message transport security * Understand how to reference security profiles in security-enabled message processing nodes * Learn how to use the Security Vault to implement message flow security |

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| Exercise 2. Securing a message flow that uses the vault  Duration: 1 hour | |
| Overview | In this exercise, you build a simple HTTP message flow that uses a Compute node and a JavaCompute node. You wire the catch terminal of the input node so you can catch exceptions in the message flow. You create a JDBC policy to configure a connection to the SAMPLE database and reference that policy in the JavaCompute node. You then use the vault to secure credentials for the server and database connection. To test the credentials, you run the message flow without the credentials, then evaluate the exception. You then change the credentials and rerun the message flow successfully. |
| Learning objectives | After completing this exercise, you should be able to:   * Secure a server by using credentials that are stored in a vault * Create a secure connection to a database that uses the credentials that are stored in the vault * Reference a JDBC policy in a JavaCompute node |

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| Unit 3. Debugging message flows  Duration: 1 hour | |
| Overview | In this unit, you learn about runtime errors in message flow applications. You learn how IBM App Connect responds to a runtime exception and what happens to the data that is being processed. You also learn how transactions can be coordinated. The unit also introduces some of the tools and techniques that IBM App Connect offers for problem determination and debugging, and how to support explicit error handling within a message flow application. |
| Learning objectives | After completing this unit, you should be able to:   * Describe debugging tools to aid in testing and troubleshooting message flows * Explain how to enable a user trace and retrieve the collected trace data * Learn how to use the Unit Test Client to perform a component trace of a message flow * Describe how to examine the IBM App Connect Enterprise logs and system logs to diagnose problems |

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| Exercise 3. Debugging a message flow  Duration: 1 hour | |
| Overview | This exercise focuses on activating and examining user trace in IBM App Connect Enterprise and then using system logs to complete problem identification in a message flow. You also use the IBM App Connect Enterprise Toolkit Unit Test Client and component tracing to identify the cause of a message flow failure. This exercise also shows you how to use the IBM App Connect Console to determine failure code value. |
| Learning objectives | After completing this exercise, you should be able to:   * Enable a user trace and retrieve the collected trace data * Use the IBM App Connect Enterprise Toolkit Test Client to perform a component trace of a message flow * Examine the IBM App Connect Enterprise logs and system logs to diagnose problems |

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| Unit 4. Implementing error handling in message flows  Duration: 1 hour | |
| Overview | In this unit, you learn about runtime errors in message flow applications. You learn how IBM App Connect Enterprise responds to a runtime exception and what happens to the data that is being processed. You also learn how transactions can be coordinated. The unit also introduces some of the tools and techniques that IBM App Connect Enterprise offers for troubleshooting and how to support explicit error handling within a message flow application. |
| Learning objectives | After completing this unit, you should be able to:   * Explain how to use reusable sublflows * Use the TryCatch and Throw nodes to implement explicit error handling within a message flow * Describe the structure of the ExceptionList component of the message assembly, and the role it plays in runtime error handling * Understand how to catch exceptions and perform failure checking on nodes in a message flow. |

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| Exercise 4. Implementing error handling in a message flow  Duration: 1 hour | |
| Overview | In this exercise, you implement message processing nodes that control the paths that messages take in a message flow. You also write a general-purpose subflow to handle errors that occur during message processing. |
| Learning objectives | After completing this exercise, you should be able to:   * Create a generic error handling routine in the form of a subflow. * Use a ResetContentDescriptor node to force the message to be reparsed according to the parser domain that is specified in the node properties. * Configure a TryCatch node to provide a special handler for exception processing |

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| Unit 5. Creating patterns for reusability  Duration: 1 hour | |
| Overview | In this unit, you learn how to develop integration solutions by using patterns. You learn how the IBM App Connect Enterprise Toolkit can be used to create resources that are used to solve a specific business problem. This unit also demonstrates how to use the Patterns Explorer to enter pattern parameters. These parameters are then used to create pattern instances designated for a specific message flow. |
| Learning objectives | After completing this unit, you should be able to:   * Explain how to construct and extend a user-defined pattern * List the steps that are required to create a pattern authoring project * Learn how to build pattern plug-ins * Explain how to package and distribute pattern plug-ins * Learn how to use the IBM App Connect Toolkit to install a pattern archive |

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| Exercise 5. Creating a reusable pattern  Duration: 1 hour | |
| Overview | In this exercise, you import the solution from the error handling exercise. Then, you prepare the application to be used as an exemplar and create user-defined parameters. You then create a new pattern authoring project, configure the source files and pattern parameters, and create the pattern plugins. After creating the pattern plug-ins, you test the pattern in a new instance of the Toolkit. After testing the pattern, you create a pattern archive and import the pattern archive as a different user. |
| Learning objectives | After completing this exercise, you should be able to:   * Construct and extend a user-defined pattern * Create and configure an exemplar * Create a pattern authoring project * Configure user-defined parameters * Package and distribute a pattern |

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| Unit 6. Monitoring message flows  Duration: 1 hour | |
| Overview | Integration nodes use a publish/subscribe broker to publish events in response to changes in configuration, state, or operational status. You can monitor these events by subscribing to the topics. For audit or problem determination purposes, you can record data to a database and then view it and replay it. This unit describes the IBM App Connect tools that are available for monitoring message flow events and analyzing message data. |
| Learning objectives | After completing this unit, you should be able to:   * Define monitoring events in the message flow * Explain how to use the record and replay function to capture and review processed messages |

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| Exercise 6. Record and Replaying message flow data  Duration: 1 hour and 30 minutes | |
| Overview | In this exercise, you define monitoring events and then record and replay messages. You also learn how the record function subscribes to the published monitoring data and store it in a database. Then, you replay the data by using the web user interface. |
| Learning objectives | After completing this exercise, you should be able to:   * Create monitoring events in a message flow * Learn how to activate flow monitoring in a message flow * Use the IBM App Connect Enterprise Web User Interface to view event messages * Use the App Connect Enterprise Web User Interface to replay messages * Review capture and failed report events |

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| Exercise 7. Monitoring business transactions across multiple message flows  Duration: 1 hour | |
| Overview | Business transaction monitoring involves monitoring a message across multiple message flows, so you can track and report the lifecycle of a payload message through an end-to-end enterprise transaction.You will use the App Connect Enterprise web user interface to view the results of business transactions and create business transaction definitions. |
| Learning objectives | After completing this exercise, you should be able to:   * Configure a business transaction definition in the web user interface * Create the business events that make up a business transaction definition * Use the Business transaction monitoring dashboard to view events in completed, failed, inconsistent, and in-progress states |

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| Unit 7. Preparing for production  Duration: 1 hour | |
| Overview | In this unit, you learn how to expand the capabilities of message flow applications by making them aware of the runtime environments in which they operate. You also learn techniques for implementing dynamic message routing at run time, adding monitoring and auditing, and controlling processing of message flows with applications and shared libraries. |
| Learning objectives | After completing this unit, you should be able to:   * Explain how deployed applications and shared libraries at run time to affect the visibility of resources * Describe how promoted properties, user-defined properties, and operational policies to develop environment-aware message flows * Explain how to dynamically route messages in a message flow by using external registries and registry lookup nodes to allow policy-driven message flows to meet governance requirements * List the steps that are required to add monitoring and auditing to a message flow * Explain how to complete basic performance analysis on message flows |

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| Exercise 8. Preparing for production by creating a runtime-aware message flow  Duration: 1 hour | |
| Overview | Message flows can be made even more powerful and flexible if they can interact with the environment in which they are operating. In this exercise, you modify an existing message flow in its runtime environment. |
| Learning objectives | After completing this exercise, you should be able to:   * Add a user-defined property to a message flow * Promote subflow properties to the main flow * Create custom keywords in a message flow * Deploy a BAR file with configurable properties * Examine BAR file properties at run time |

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| Unit 8. 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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