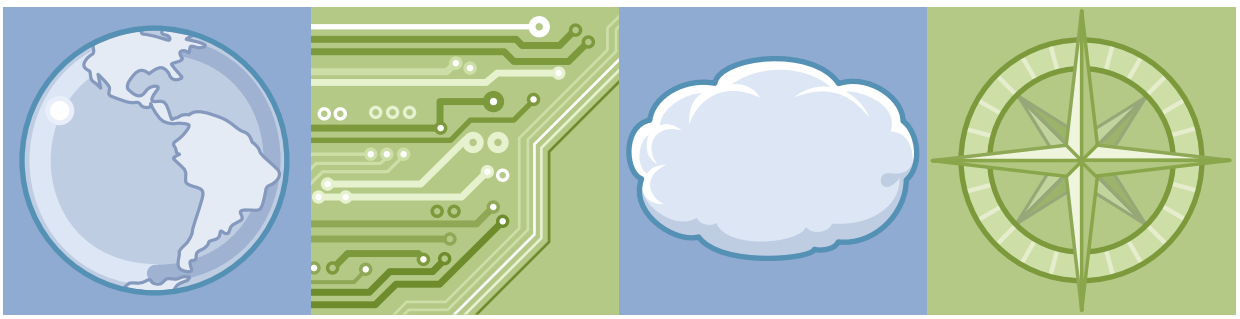
IBM Training

Student Notebook

IBM Case Foundation 5.2.1: Component integration

Course code F236 ERC 1.0



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December 2015 edition

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Course description

IBM Case Foundation 5.2.1: Component integration

Duration: 1/2 day

Purpose

This course is designed to show you:

- The purpose of component integration in workflow applications.
- What component queues provide.
- How to create a component queue.
- How to monitor and maintain component queues.

Audience

This course is for anyone who is responsible for creating, configuring, and maintaining component queues.

Audience Roles

- A workflow system administrator responsible for creating, configuring and maintaining component queues in non-development environments.
- A workflow author responsible for responsible for creating, configuring and maintaining component queues in development environments.

Prerequisites

Before attempting this unit, students must already have the following knowledge and skills:

- Basic knowledge of organization's business process applications.
- Basic knowledge of database technology.
- PCs, networks, and their organization's server operating systems at the expert level
- **Prerequisite courses:**
  - F115G IBM FileNet Content Manager 5.2: Implementation and Administration
  - F230G IBM Case Foundation 5.2.1: Introduction
  - F231G IBM Case Foundation 5.2.1: Configure the workflow system
  - F232G IBM Case Foundation 5.2.1: Workflow security
  - F233G IBM Case Foundation 5.2.1: Maintain the workflow system

- F234G IBM Case Foundation 5.2.1: Manage work in progress

Objectives

After completing this course, you should be able to:

- Understand the purpose of component integration in workflow applications.
- Understand the architecture of the Component Manager Frameworks.
- Understand what component queues provide.
- Create and configure a Java component.
- Monitor and maintain component queues.

Contents

Component integration concepts

- Purpose of component integration
- Component integrator
- Component Manager Frameworks
- Deciding on a Component Manager Framework
- Component behavior
- Types of components
- Java adapter
- JMS adapter

Create and configure component queues

- How to create and configure component queue
- Procedure: Create and configure a component queue
- Create a code module
- New Component Queue wizard
- Adapter properties
- JAAS credentials
- Configure the Java Message Service adapter
- What is a queue operation?
- Elements of an operation
- Operation parameters
- Import Java component queue operations
- Define JMS component queue operations

- Stopping and starting component queues
- Diagnosing Component Manager issues

Curriculum relationship

This section covers the courses planned for IBM Case Foundation 5.2.1 Administration. Refer to the IBM Training Paths for the curriculum relationship. The training paths will be updated as courses become available.

IBM Training Paths

`http://www.ibm.com/training`

The courses are available as single SPVC modules, or multi-day courses delivered as instructor lead training. Here is a list of the modules organized by roles. Some of the modules apply to multiple roles.

Solution Architect

- Introduction
- Workflow security

Workflow system administrator:

- Introduction
- Configure the workflow system
- Workflow security
- Maintain the workflow system
- Manage Work in Progress
- Workflow application deployment - optional
- Component Integration - optional

Workflow Author:

- Introduction
- Workflow security
- Component Integration - optional
- Workflow application deployment - optional
- Workflow Analysis tools - optional

Application developer:

- Introduction
- Workflow security

Agenda

Day 1

Welcome
Lesson 1.1: How to move FileNet workflow applications
- Checkpoint Quiz: Test your knowledge of component integration concepts
- Prepare your student system for the exercises

Lesson 1.2 - Planning and preparing for application deployment
- Demonstration: Create and configure a Java component queue
- Demonstration: Examine the Component Manager logs
- Exercise: Create and configure a Java component queue
- Exercise: Verify the Java component queue
- Exercise: Stop the component queue and examine the Component Manager logs

Unit 1. IBM Case Foundation 5.2.1: Component integration

What this unit is about

This course is for anyone who is responsible for creating, configuring, and maintaining component queues.

What you should be able to do

After completing this unit, you should be able to:

- What is the purpose of component integration in workflow applications?
- Create and configure component queues

How you will check your progress

- Knowledge checkpoint exercise and hands on labs.

References

IBM FileNet P8 Platform V5.2.1 Documentation

http://www.ibm.com/support/knowledgecenter/SSNW2F_5.2.1/com.ibm.p8toc.doc/welcome_p8.htm

Migrating to the IBM FileNet P8 5.2 Component Manager Framework technote

http://www.ibm.com/support/docview.wss?uid=swg27043131

How can I help myself when errors occur?

https://www.ibm.com/developerworks/community/blogs/f70916bb-0083-4dee-8297-84c8820ea35a/entry/knowledge_resources_how_can_i_help_myself_when_errors_occur

IBM Case Foundation 5.2.1: Component integration

Unit objectives

After completing this unit, you should be able to:

- Understand the purpose of component integration in workflow applications.
- Create and configure component queues.

Figure 1-1. Unit objectives F2361.0

IBM Case Foundation 5.2.1: Component integration

Unit lessons

This unit contains these lessons:

- Component integration concepts
- Create and configure component queues

Figure 1-2. Unit lessons F2361.0

Lesson 1.1. Component integration concepts

Lesson

Component integration concepts

Why is this lesson important to you?

- You are a workflow system administrator responsible for configuring and maintaining component queues in non-development environments. You need to be familiar with the function of component queues and the purpose they provide in FileNet workflow applications.

Figure 1-3. Component integration concepts F2361.0

Component integration concepts

Activities that you need to complete

- Test your knowledge of component integration.
- Prepare your system for the student exercises.

Figure 1-4. Activities that you need to complete F2361.0

Notes:

The activities that you are going to perform in this lesson.

Component integration concepts

Purpose of component integration

- Extend business functionality easily without full application development.
- Automate work processing.
- Perform external functions from within a workflow.
- Use existing Java business objects and components.
- Integrate with a Java Message Service (JMS).

Figure 1-5. Purpose of component integration F2361.0

Notes:

With component integration, you can extend business functionality easily without requiring full application development.

You can perform external functions from within the workflow application, and use existing Java business objects and components or a Java Message Service.

Component integration concepts

Component integrator

- The component integrator architecture

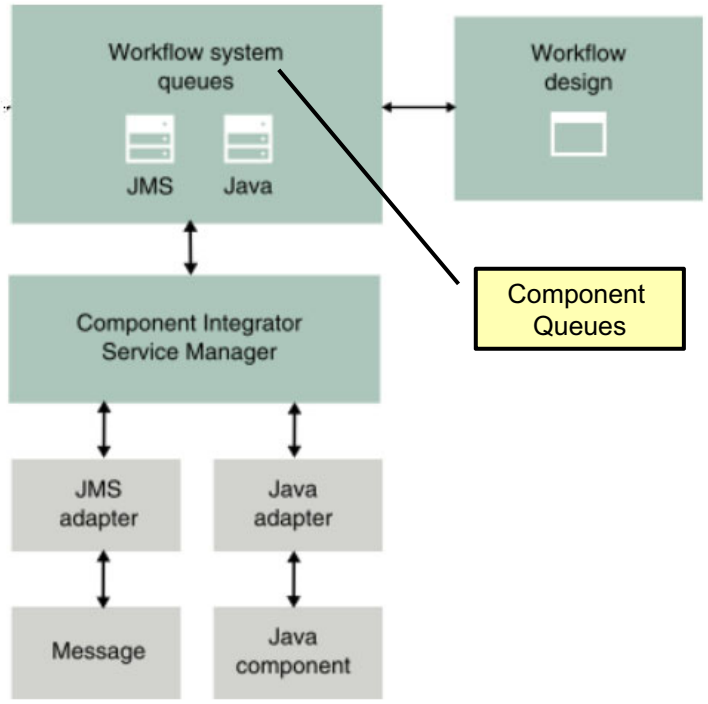


Figure 1-6. Component integrator F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Developing FileNet P8 applications>Process Development>Process Java Developer's Guide>Developing Process Applications>Developing Work Performers

The Component Integrator is also known as the Component Manager Framework.

The diagram shows the Component integrator architecture.

Component Manager connects a work item that is requesting a component to the appropriate service adapter.

Component Manager communicates with the service adapters. At run time, Component Manager polls component queues, labeled as Workflow system queues, in the diagram, for work items that request Java Message Service (JMS) or processing by Java components.

The JMS adapter places messages on the JMS Queue and dispatches the associated work item. The JMS adapter handles posting of Process events to a message queue. The posting is in the form of an XML event, based on the step element for the operation. For JMS information, see http://docs.oracle.com/javaee/6/tutorial/doc/bncdq.html.

The Java adapter handles process calls to Java objects. The calls are represented to the Content Platform Engine as operations on queues (work items), where each operation is done by a method of the Java class. The Java adapter performs the following sequence of actions:

- Loads the Java component class.
- Runs the interface that is associated with the Java component.
- Waits for a response from the Java component.
- Updates the work item field values.
- Dispatches the work item to the next workflow step.

Note

The diagram on this slide shows only the portion of the architecture that applies to the new component queues.

Component integration concepts

Component Manager Frameworks

- Two Component Manager Frameworks
  - New Component Manager Framework (V2)
  - Old/Legacy Component Manager Framework (V1)
- Both frameworks are fundamentally the same

Facts	New Component Manager framework	Old Component Manager framework
Where the component manager runs	Content Platform Engine (CPE) server	Workplace XT or Application Engine servers
Starting and stopping the component manager	Runs automatically on all CPE nodes. You can disable a specific component queue.	Each instance is started and stopped independently with Process Task Manager.
Location of the JAR files	JAR files are added to an object store as a code module.	JAR files are copied to all appropriate instances of Workplace XT or Application Engine servers.
When changes take effect	When component configuration changes are saved or committed	When Process Task Manager is stopped and restarted

Figure 1-7. Component Manager Frameworks F2361.0

Notes:

Help path

Migrating to the IBM FileNet P8 5.2 Component Manager Framework technote: Section: Comparing the two Component Manager Frameworks

Starting with the IBM Case Foundation 5.2 release, a new component manager framework was introduced which runs within the Content Platform Engine server.

Two frameworks are supported:

- The new Component Manager framework, also called Component Manager V2.
- The old or legacy Component Manager framework, also called Component Manager V1.

Customers can choose to use the following frameworks.

- New component manager framework only.
- Old/legacy component manager framework only.
- A combination of the two frameworks.

The two frameworks are fundamentally the same. Both frameworks use component queues and component manager to connect to external entities. The main difference is where the component manager runs.

The new component manager runs in the Content Platform Engine server. The old component manager requires Workplace XT or Application Engine servers to run.

The table lists some of the major differences. For a complete list, see the technote.

Component integration concepts

Deciding on a Component Manager Framework

- New Component Manager Framework
  - Packaged and deployed with CPE server, runs as a background task.
    - Implements consistent load balancing and High Availability model.
  - Easier to administer and maintain.
  - More performance information and logs available.
  - Does not require Workplace XT or Application Engine servers
- Old/legacy Component Manager Framework
  - More flexibility but more maintenance required. You can:
    - Run different component adapters on different servers.
    - Define multiple component managers per connection point.
    - Assign different priorities to each component queue.
    - Have more control over the class path.

Figure 1-8. Deciding on a Component Manager Framework F2361.0

Notes:

Which Component Manager Framework is right for you?

The new Component Manager Framework:

- Is packaged and deployed with the Content Platform Engine server, and runs as a background task.
- Does not require extra steps to configure it.
- Is easier to administer and maintain.
- Provides more performance information and logs for maintenance and troubleshooting.
- Does not require Workplace XT or Application Engine, which aligns with IBM's strategic plan of using IBM Content Navigator as your application framework.

Note

No enhancements are being made to either Workplace XT or Application Engine.

The old or legacy Component Manager Framework:

- Provides more flexibility, you can:
  - Run different component adapters on different Workplace XT or Application Engine servers.
  - Define multiple component managers in each connection point.
  - Assign different priorities to each component queue.
  - Have more control of the class path.

Component integration concepts

Component behavior

- A component is an application that performs an operation in a workflow.
  - It is used to process workflow data.
  - It typically has no user interface.
  - It typically performs automatic operations on work items.
- A work item waits in a component queue for processing.
  - The work item makes a request of a component.
  - The component can perform other actions outside the isolated region.
  - The component can provide a response.

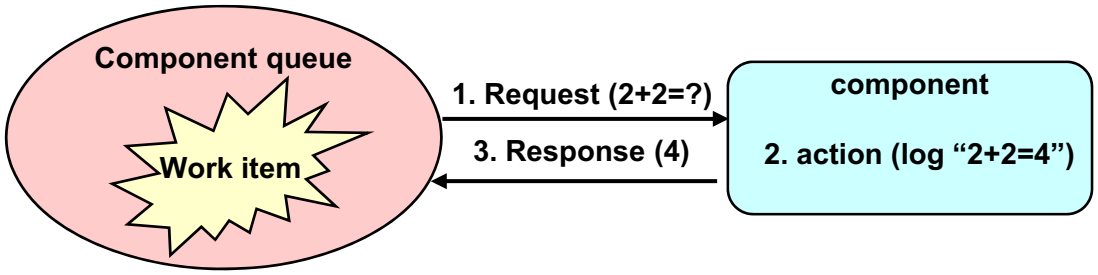


Figure 1-9. Component behavior F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.0>Developing FileNet P8 applications>Process Engine Development>Process Java Developer's Guide>Developing Process Applications>Developing Work Performers

Components typically perform automated functions that do not require human intervention.

The activity initiates the work item, which sends data to the component as a request. The component can return a response from the request if configured to do so, or the component can perform some function outside the isolated region, such as filing a document in an object store. Both behaviors are optional.

For example, if a work item requests the sum of two numbers, the work item can send them to a component that performs addition. The component can send the sum back to the work item, or the component can send the sum (or the original parameters) elsewhere, as the application demands. The diagram illustrates this example.

Other operations associated with workflow steps can include:

- Log in and establishing a Process Services session.

- Polling a user, or system queue (to find operations that are related to a particular workflow step).
- Locking the retrieved object, processing the work (such as performing updates of data or saving), and cycling back to queue polling.

Definition: A component queue is a queue that holds work items that an external entity that interacts with the workflow by using the Component Integrator, can complete.

Component queues reside in an isolated region.

Component integration concepts

Types of components

- Java component
  - Component functionality is provided by a Java archive file.
  - Java classes contain methods and operations to perform the work.
  - Data can move in both directions:
    - From the isolated region to the component
    - From the component to the isolated region
  - Uses a configured Java component adapter.
- JMS component
  - Component functionality sends a message to a specified queue in a JNDI QueueConnectionFactory.
  - Data moves only from the isolated region to the JMS queue.
  - Functionality is contained in the JMS component adapter.

Figure 1-10. Types of components F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Developing FileNet P8 applications>Process Development>Process Java Developer's Guide>Developing Process Applications>Developing Work Performers>Developing Component Integrator-Based Work Performers

Java

Java objects are archived classes or collections of classes that perform a function. IBM Case Foundation provides a Java component named CE_Operations to provide workflow definitions programmatic access to FileNet P8 domain object store objects.

The Java adapter allows the solution builder to expose public methods from a Java class as operations on a queue.

Java Message Service (JMS)

The Java Message Service (JMS) was designed to develop business applications that asynchronously send and receive business data and events.

Component integration concepts

Java adapter

- The Java adapter:
  - Handles Process calls to Java objects.
    - Process calls are represented as operations on queues (work items).
      - Each operation is run by a method of a Java class.
- The Java adapter performs the following sequence of actions:
  - Runs the interface to the Java component.
  - Automatically waits for a response from the component.
  - Updates the work item.
  - Dispatches the work item to the next workflow step.

Figure 1-11. Java adapter F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Developing FileNet P8 applications>Process Development>Process Java Developer's Guide>Developing Process Applications>Developing Work Performers

The Java adapter handles Process calls to Java objects. The calls are represented as operations on queues (work items), where each operation is run by a method of the Java class.

The Java adapter performs the following sequence of actions:

- Runs the interface to the Java component.
- Automatically waits for a response from the component.
- Updates the work item.
- Dispatches the work item to the next workflow step.

When there are multiple operations, in a component queue, defined in a single step, the operations run serially. For example, if you have op1 and op2 defined on queue X, in the same step, the component manager will:

- Finish the operation, op1.
- Dispatch the work item to queue X again.
- Query and finish operation, op2.

Component integration concepts

Java Message Service (JMS) adapter

- The JMS adapter:
  - Places messages on the JMS component queue.
  - Dispatches the associated work item.
  - Handles posting of Process events to a message queue.
    - Posting is in the form of an XML event.
      - Based on the step element of the operation.

Figure 1-12. Java Message Service (JMS) adapter F2361.0

Notes:

The JMS adapter, places messages on the JMS component queue and dispatches the associated work item.

The JMS adapter handles posting of the Process events to a message queue. The posting is in the form of an XML event, based on the step element for the operation.

Component integration concepts

Exercise introduction

Test your knowledge of component integration concepts.

- Checkpoint Quiz

Prepare your student system for the exercises.

- In this exercise, you will:
  - Start the student system components.
  - Check system components.
  - Configure the JAAS credentials for the CE_Operations component queue.

Figure 1-13. Exercise introduction F2361.0

Notes:

The first exercise is a checkpoint quiz. The questions are multiple choice and true and false.

In the second exercise, you prepare your student system for the exercises. You start the student system and verify that the system is functioning properly. In the last procedure you change the JAAS credentials for the CE_Operations component queue. Remember in the new Component Manager Framework, the component queue, CE_Operations, is created a by default.

Component integration concepts

Activities

In your Student Exercises

- Unit: Unit name
- Lesson: Lesson name
- Activities:
  - Test your knowledge of component integration.
  - Prepare your system for the student exercises.

Figure 1-14. Activities F2361.0

Notes:

The first activity is a checkpoint quiz, included in the next three slides.

Use your Student Exercises to perform the second activity.

Component integration concepts

Checkpoint

1. Select the option that is not a purpose of component integration.
   a. Extend business functionality easily without full application development.
   b. Use existing Java business objects and components.
   c. Perform external functions from within a workflow.
   d. Provide integration for a component step processor.
2. Starting with the IBM Case Foundation 5.2 release, a new Component Manager Framework was introduced. Where does this framework run?
   a. Within the Content Platform Engine server.
   b. Within the Process Task Manager, running on a Workplace XT server.
   c. As a task within the Administration Console for Content Platform Engine.
   d. Within the Process Configuration Console.
3. IBM Case Foundation 5.2 supports Java components only. (T or F)?

Figure 1-15. Checkpoint F2361.0

Checkpoint

4. Which of the following statments is not an advantage to using the new Component Manager Framework?
   a. Easier to administer and maintain.
   b. More control over the class path.
   c. More performance information and logs available.
   d. Does not require Application Engine servers.
5. Which one of the following elements is used in component queues for authentication?
   a. JNDI
   b. Active Directory
   c. JAAS
   d. Component Manager
6. A component is an operation that waits in a component queue for processing. (T or **F**)?

Figure 1-16. Checkpoint F2361.0

Component integration concepts

Checkpoint

7. Which of the following component integration elements sends a message to a queue in a JNDI QueueConnectionFactory?
   a. Process Task Manager
   b. Java adapter
   c. CE_Operations
   d. JMS adapter
8. The two Component Manager Frameworks, supported since the IBM Case Foundation 5.2 release, are fundamentally the same. (T or F)?

Figure 1-17. Checkpoint F2361.0

Lesson 1.2. Create and configure component queues

Lesson

Create and configure component queues

Why is this lesson important to you?

- A Java component that calculates the monthly loan payment amount is deployed on your system by a developer. You need to create and configure a component queue in the isolated region to communicate with the Java component.

Figure 1-18. Create and configure component queues F2361.0

Create and configure component queues

Activities that you need to complete

- Create and configure a Java component queue.
- Verify the component queue.
- Stop and start the component queue.

Figure 1-19. Activities that you need to complete F2361.0

Notes:

The activities that you are going to perform in this lesson.

Create and configure component queues

How to create and configure a component queue

- New Component Manager Framework:
  - Use Administration Console for Content Platform Engine or Process Configuration Console.
  1. Create a component queue.
  2. Complete the adapter configuration.
     - Java or JMS adapter.
  3. Import the Operations.
  4. Save the changes.

- Old Component Manager Framework:
  - Use Process Configuration Console.
  1. Create a component queue.
  2. Complete the adapter configuration.
     - Java or JMS adapter.
  3. Import the Operations.
  4. Commit the changes.
  5. Create a Component Manager in Process Task Manager on the Workplace XT or Application Engine servers.

Figure 1-20. How to create and configure a component queue F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Administering>Administering Content Platform Engine>Defining the workflow system>Coordinating workflow design>Workflow options>Defining queues>Component queues>Creating component queues

This slide outlines the steps involved in creating a component queue for both the new and the old Component Manager frameworks.

The steps are similar. The legacy Component Manager framework has one extra step, create a Component Manager with Process Task Manager on the Workplace XT or Application Engine servers.

The labs for this course focus on the new Component Manager Framework, since the image is configured with IBM Content Navigator as the application framework.

Information

For information on the steps required to create and configure legacy component queues, see the IBM Knowledge Center topic,

FileNet P8 Platform 5.2.1>Administering>Administering Content Platform Engine>Defining the workflow system>Administrative tools>Process Task Manager>Legacy Component Manager

http://www.ibm.com/support/knowledgecenter/SSNW2F_5.2.1/com.ibm.p8.pe.taskmgrui.doc/cm.htm

Create and configure component queues

Procedure: Create and configure a component queue

- Use Administration Console for Content Platform Engine

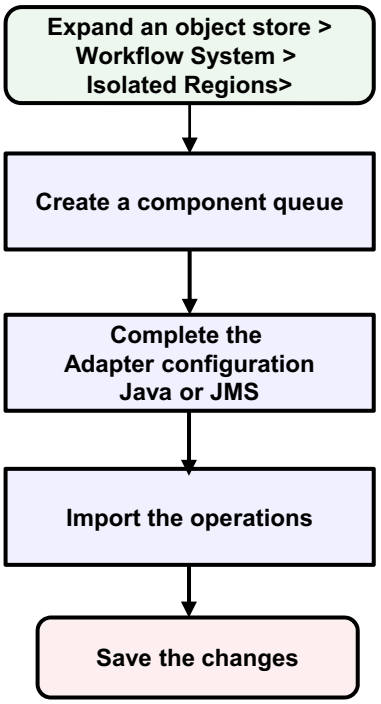


Figure 1-21. Procedure: Create and configure a component queue F2361.0

Notes:

The diagram outlines the high-level steps that are required to create and configure a component queue.

In the next few slides, you see how to create a Java component queue.

Create and configure component queues

Create a code module

- Prerequisite for new component queues.
- Code module contains:
  - The JAR files with all the items required by the custom component.

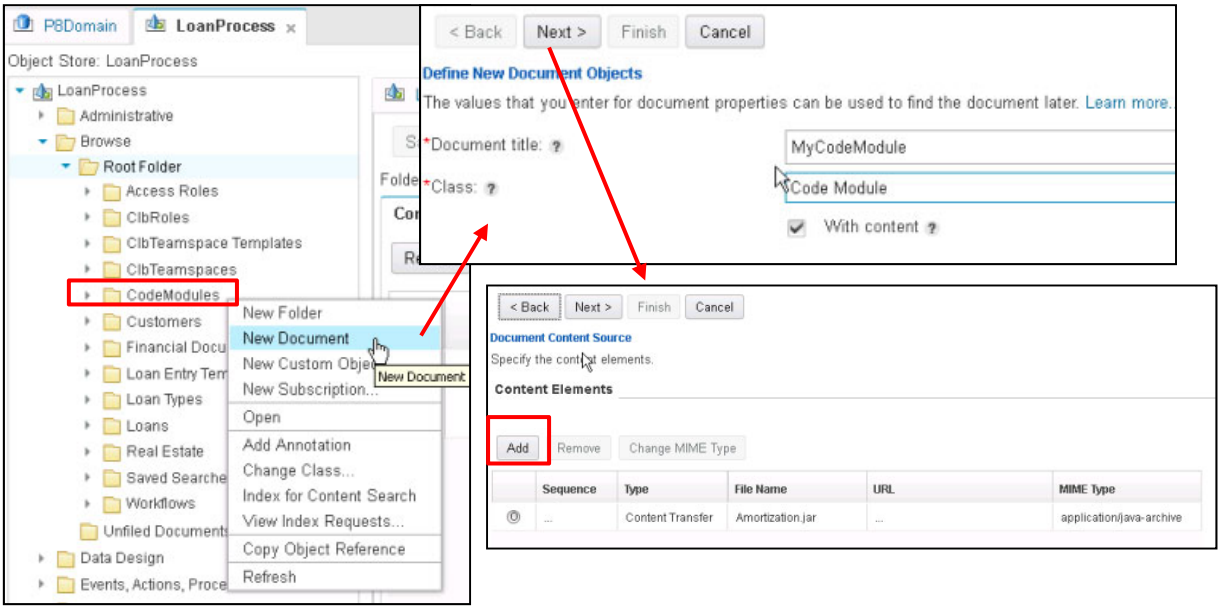


Figure 1-22. Create a code module F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.0>Administering FileNet P8>Administering Content Platform Engine>Changing objects>Managing code modules>Creating a code module

The new component queues require that the Java JAR file is uploaded as a code module in an object store. The legacy component queues load the Java JAR files and their libraries directly into the adapter.

The screen capture on the left shows the Administration Console for Content Platform Engine, you:

- Open the object store.
- Expand Browse > Root Folder.
- Right-click CodeModules and select New Document.

Enter the document title and select the Class, Code Module. (Screen capture on the upper left).

Add the content element, screen capture on the lower right. You click Add; then, browse to the JAR file.

The JAR file is the only thing that is required for a Java component. You can accept the defaults for the rest of the windows until the Finish is enabled.

- Click the Finish to complete the creation of the code module.

Important

If you modify a code module and check-in a new version of the code module, you need to update the component queue to point to the new version of the code module.

Create and configure component queues

New Component Queue wizard

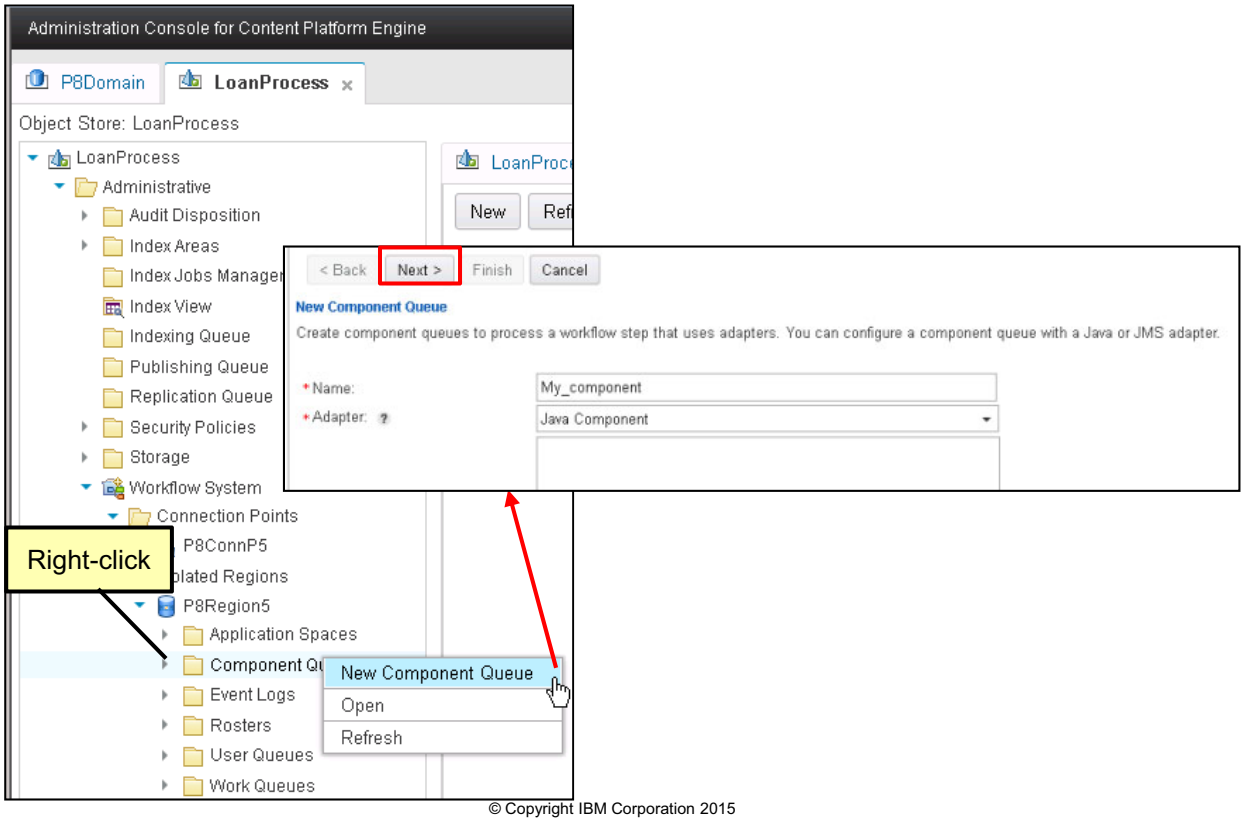


Figure 1-23. New Component Queue wizard F2361.0

Notes:

The next few slides show the steps to create a Java component queue with the new component queue wizard.

The screen captures show the Administration Console for Content Platform Engine, open to the object store, Loan Process, on the left.

- You expand Administrative > Workflow System > Isolated Regions > the specific region (P8Region5).
- Right-click the node, Component Queues, and select New Component Queue.
- The New Component Queue wizard displays on the right.
- You enter a name and click
  - The name:
    - Must begin with a letter.
    - Must contain only letters, numbers or underscores.
    - Can have a maximum of 128 characters.

    - Cannot be a name reserved for Content Platform Engine internal use.
  - If you enter an invalid name, you get a message that the name is not valid and the naming requirements.
- You enter the type of component you want to create. In this case, a Java component is selected.
- Click Next.

Create and configure component queues

New Component Queue wizard (2)

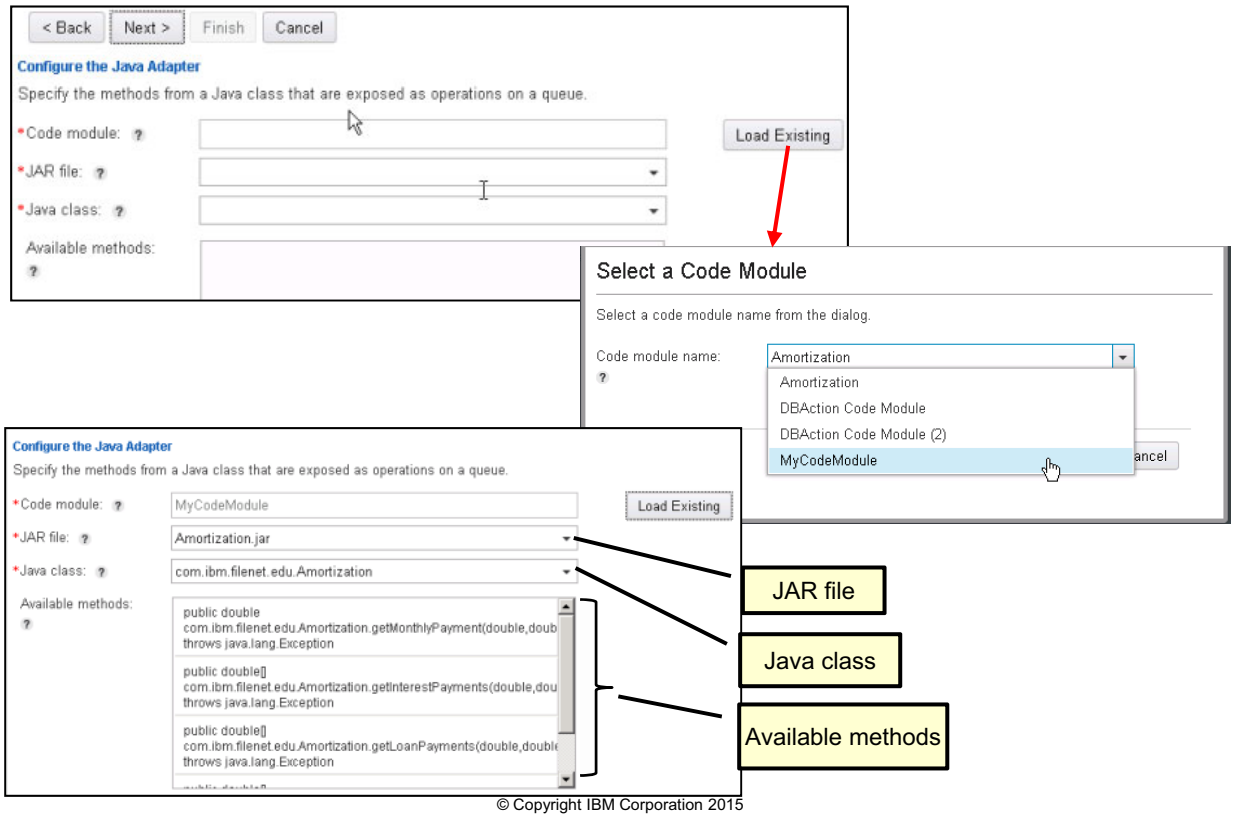


Figure 1-24. New Component Queue wizard (2) F2361.0

Notes:

The Configure the Java Adapter window opens, upper left screen capture.

- Click Load Existing, and the Select a Code Module window opens. (Screen capture in the center).
  - Select the code module and click OK.
- The remaining fields for the Java adapter are automatically populated with the information from the code module. (Screen capture on the lower left). The JAR file, the Java class, and the available methods.
- Click Next.

Note

Multiple component queues can use the same code module. This technote describes how to configure the component queues. Reference:
http://www.ibm.com/support/docview.wss?uid=swg21882893

Create and configure component queues

New Component Queue wizard (3)

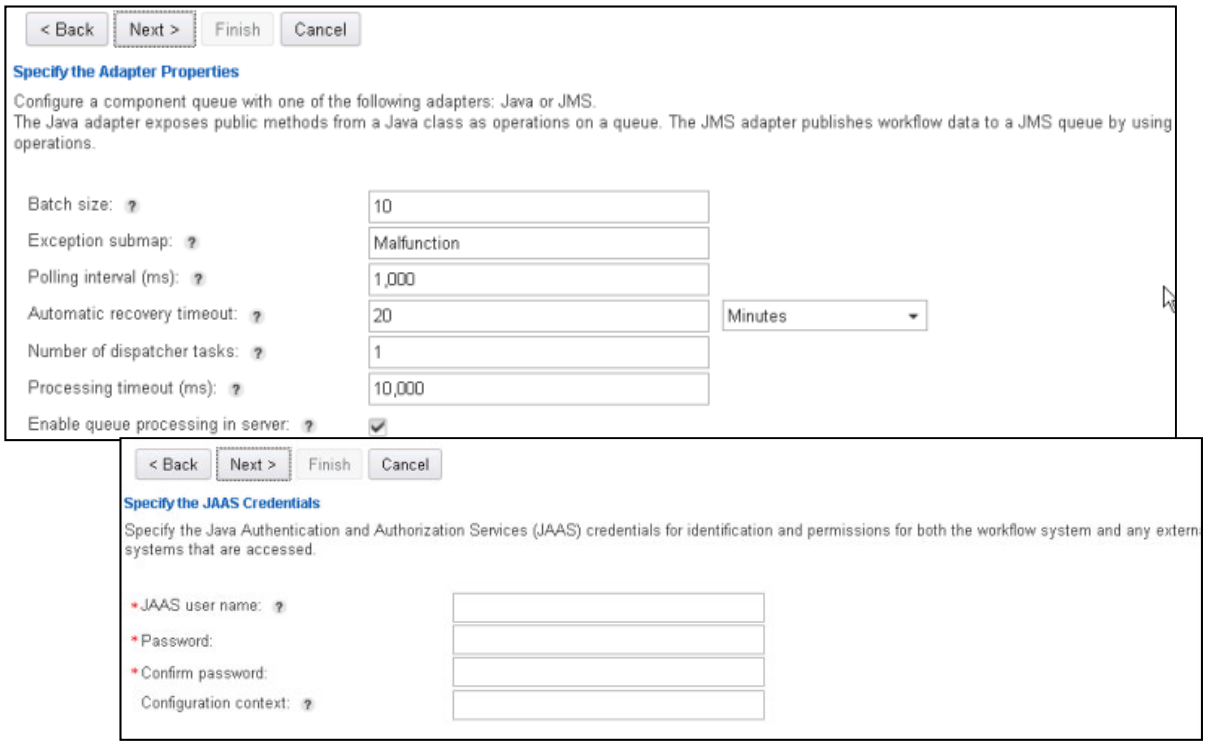


Figure 1-25. New Component Queue wizard (3) F2361.0

Notes:

The last two windows that display are:

- Specify the Adapter Properties, upper screen capture.
- Specify the JAAS Credentials, lower screen capture.

The next couple of slides will cover the adapter properties and the JAAS credentials in more detail.

Create and configure component queues

Adapter properties

- Batch size
- Exception submap
- Polling rate
- Automatic recovery timeout
- Number of dispatch tasks
- Processing timeout
- Enable queue processing in server

Figure 1-26. Adapter properties F2361.0

Notes:

Help paths

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Configuring the workflow system>Configuring workflow queues>Manage component queues>Creating a component queue>Adapter properties

Migrating to the IBM FileNet P8 5.2 Component Manager Framework technote: Section: Managing the new component queues

Batch size – The number of steps to query per batch at run time. The suggested minimum is 10.

Exception submap – submap to use if an exception occurs. The Malfunction submap is the default, which routes work items to the Conductor queue.

Polling rate – The time, in milliseconds, between polls of the component queue to look for work. 1000 is equivalent to polling once per second.

Automatic recovery timeout – Time after which a locked work object is dispatched to the exception submap. This recovery behavior handles work objects that are locked due to server crashes or adapter classes that are not working properly.

Number of dispatch tasks – The maximum # of worker threads that service the component queue.

Processing timeout – The maximum time, in milliseconds, for processing each step in a component method.

Enable queue processing in server – Starts and stops the component queue.

Create and configure component queues

JAAS credentials

Java Authentication and Authorization Services (JAAS)

- JAAS user name and password
  - Valid domain user able to log on to the Content Platform Engine.
  - Use a service user account (suggested).
    - Not used by regular users to log on.
  - Requires [QP] access to the component queue.
- Configuration context:
  - Not needed if:
    - Component code uses PE or CE API only, and
    - External authentication is not required.
  - CELogin can be specified for compatibility of the Java API (3.5 Content Engine Java API).
  - Provided by the Java component developer.

Figure 1-27. JAAS credentials F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Configuring the workflow system>Configuring workflow queues>Manage component queues>Creating a component queue>JAAS credentials

All component queues require that you configure the JAAS credentials. (Java and JMS)

The JAAS user name:

- Does not need to be a user with administrative rights.
- Can be any valid domain user that can log on to the Content Platform Engine.
- Is suggested to be a service user account. Not one that users use to log on to prevent the password from getting changed unexpectedly.
- Requires query and process rights to the component queue.

The Configuration context:

- Not required if you are using CELogin and the component code does not have external authentication requirements.
- Provided by the Java component developer and configured according to the J2EE Application Server requirements.

Create and configure component queues

Configure the Java Message Service adapter

- Queue Connection Factory (JNDI)
  - The name of the JMS object that creates the connection from the component queue.
  - Depends on web server application type.
  - Provided by the workflow author or developer.
- Queue Name (JNDI)
  - The name of the JMS object that holds the message.
  - Provided by the workflow author or developer.
- JNDI URL
  - Optional JNDI URL parameter for the queue location.
    - If not specified, assumed to be defined in the workflow system application server.
  - Provided by the workflow author or developer.

Figure 1-28. Configure the Java Message Service adapter F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Configuring the workflow system>Configuring workflow queues>Manage component queues>Creating a component queue>Configuring a Java Message Service component adapter

Configuring a JMS component queue, you configure the JMS component adapter. You specify:

- The Queue Connection Factory (JNDI).
- The Queue Name (JNDI).
- An optional JNDI URL.

The information that you need is provided by the workflow author or developer.

Create and configure component queues

What is a queue operation?

- An operation is:
  - Used to process work items in a queue.
  - Specifies input and output for the task (function).
  - Used to validate data based on the requirements for defined type and direction.
- Workflow author/developer:
  - Defines the queue operations.
- Workflow system administrator:
  - Imports the operation into a component queue.

Figure 1-29. What is a queue operation? F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Process applications concepts>Design and run workflows>About operations

A queue operation is a queue property used to exchange data between work items and a function in an application that accesses the queue, such as a step processor or automated process. Through its parameters, an operation can accept input from or provide output to a work item or do both.

The purpose of an operation is to assure a set of data that meets defined requirements (data type and data direction, also called data flow).

Typically, operations are defined on queues for work items processed by automated programs. Though less common, operations can also be defined on queues from which participants process work items, including user inbaskets.

More than one operation can be defined for a queue. A defined operation is used only to process a work item if the operation is explicitly designated at a step in the workflow definition.

Each parameter in an operation must have an associated workflow field if a step uses that operation.

Create and configure component queues

Elements of an operation

- An operation includes the following elements:
  - Operation name
  - Operation parameters
  - Optional operation description
- The operation name identifies the operation in these elements:
  - Workflow definition
  - Queue
- The operation parameters:
  - Name
  - Parameter type
  - Data flow for each parameter
  - Optional description

Figure 1-30. Elements of an operation F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Configuring the workflow system>Configuring workflow queues>Manage component queues>Defining component queue operations

An operation includes the name, parameters, and an optional description.

The operation name is used in the workflow definition and the queue to identify it.

The operation parameters include:

- Name
- Parameter type
- Data flow for each parameter
- Optional description

Create and configure component queues

Operation parameters

- Data types of operation parameters must map to the data types of the workflow fields.
  - Operation parameter name can be different from the field name in the workflow.
  - Arrays of these data types are also supported.
  - VWAttachment and VWParticipant are allowed.

Operation parameters type	Workflow field type
– Boolean	Boolean
– String	String
– Float	Float or Integer
– Time	Time

- Data flow
  - Read: From work item to operation, when step is opened
  - Write: From operation to work item, when step is completed
  - Read/Write: Both actions

Figure 1-31. Operation parameters F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Process applications concepts>Design and run workflows>About operations>Operation usage example

The operation parameter types must map to workflow data field types in the step that uses the operation.

Data flow behavior:

- [Read] The operation parameter value is copied to the associated workflow field when the step opens.
- [Write] The workflow field value is written to the operation parameter when the step is completed.
- [Read/Write] includes both behaviors.

Create and configure component queues

Import component queue operations

- Define the component queue operations.
  1. Open Process Configuration Console from ACCE.
  2. Connect to the appropriate connection point.
  3. Select the Component Queues node.
  4. Right-click the component queue and select Properties.
  5. On the Operations tab, click the Import icon
     a. Open either the:
        – Java select operations window
          > Select one or more methods.
          > Rename parameters and enter descriptions [optional].
        – JMS select events window.
          > Enter an event name.
          > Select the event name and specify the parameters for the event.
          > Enter a description for each event and parameter [optional].
  6. Click OK and Commit Changes.

Figure 1-32. Import component queue operations F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Configuring the workflow system>Configuring workflow queues>Manage component queues>Defining component queue operations

The next step in configuring the component queue is to import the operations.

At the writing of this course, you must use the Process Configuration Console to import the operations.

Note

A future fix pack includes the ability to import the operations with Administration Console for Content Platform Engine.

Create and configure component queues

Import Java component queue operations

- Component queue Properties > Operations tab

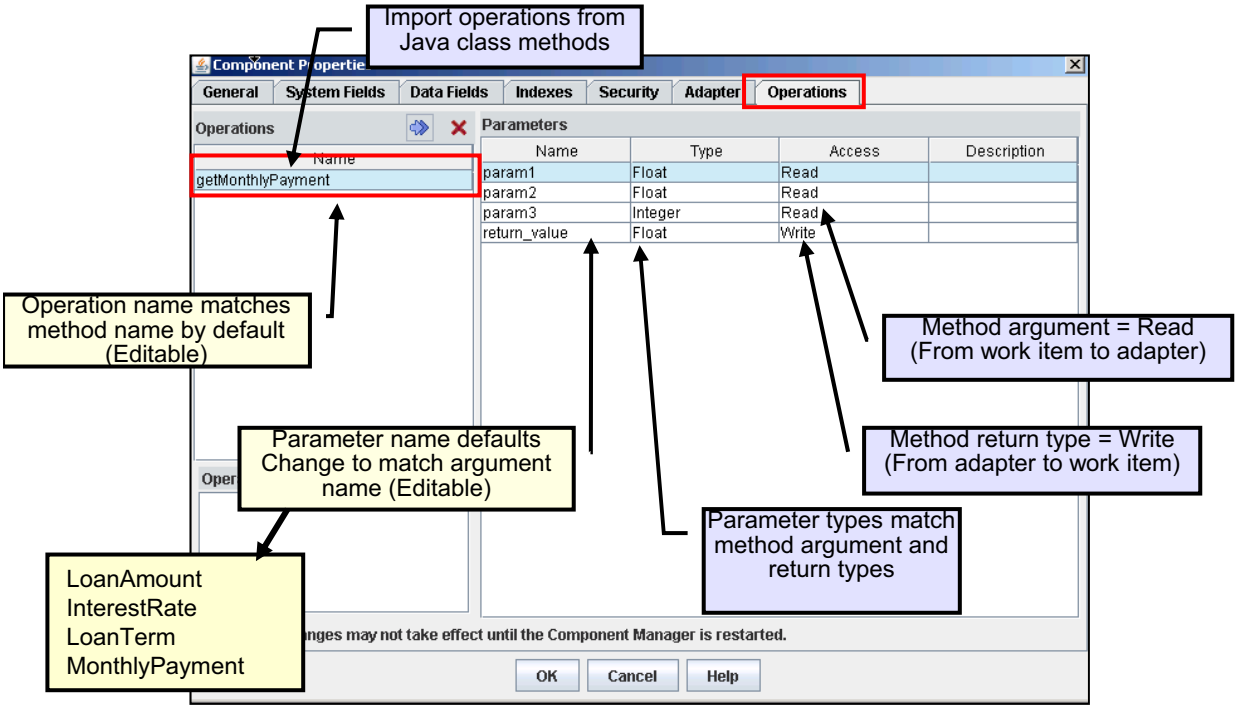


Figure 1-33. Import Java component queue operations F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Configuring the workflow system>Configuring workflow queues>Manage component queues>Defining component queue operations>Java operations window

Screen capture

The screen capture has labels that callout the following information:

- Import operations from Java class methods
- Operation name matches method name by default (Editable)
- Parameter name defaults (Editable). Parameter names are common changes to match the argument names.
- Method argument = Read (From work item to adapter)
- Method return type = Write (From adapter to work item)
- Parameter types match method argument and return types

Example

A component step sends the data to a Java class that uses the data to get the monthly payment, given the loan amount, interest rate, and loan term.

Create and configure component queues

Define JMS component queue operations

- JMS component queue Properties > Operations tab
- Click Import icon in Operations pane.

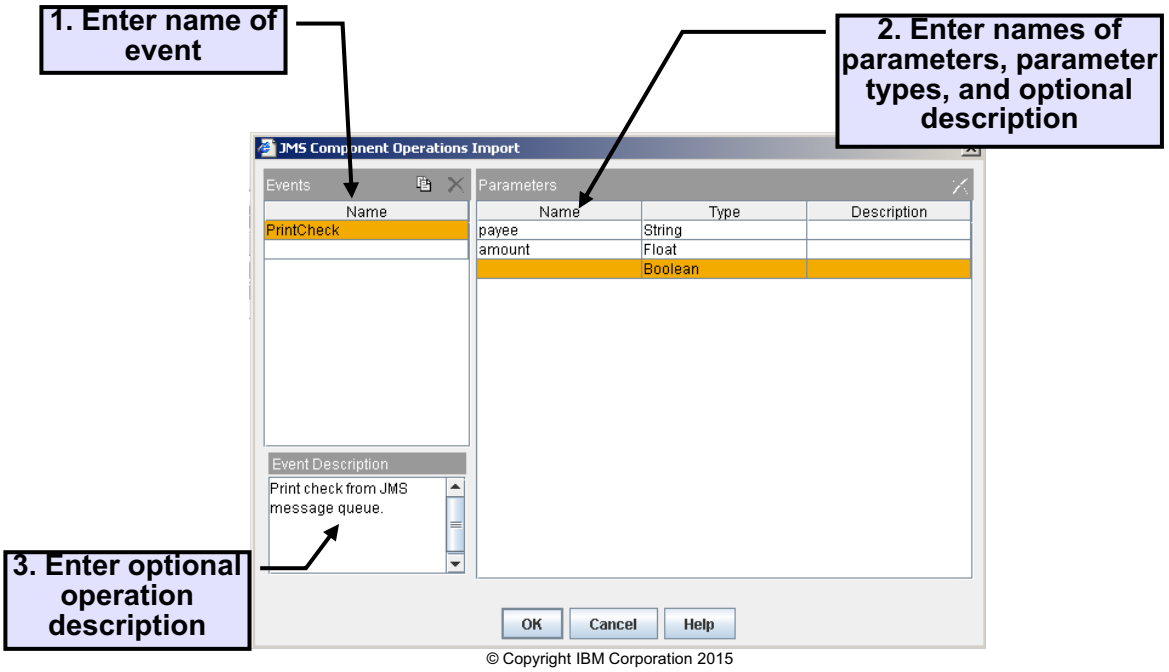


Figure 1-34. Define JSM component queue operations F2361.0

Notes:

Help path

FileNet P8 Platform 5.2.1>Integrating workflow into document management>Configuring the workflow system>Configuring workflow queues>Manage component queues>Defining component queue operations>Java Message Service operations window

The screen capture shows the fields that are used to define the operations in a JMS component queue. The labels correspond to the following steps:

1. Enter the name of the event.
2. Enter names of the parameters, specify the parameter data types, and specify optional descriptions.
3. Type an optional operation description.

The events are converted into operations.

Create and configure component queues

Stopping and starting component queues

- Component queues are started automatically upon creation.
  - Updates are applied as soon as the changes are saved.
- To stop a component queue:
  - Clear the “Enable Queue Processing in Server” check box.
  - Click Save.

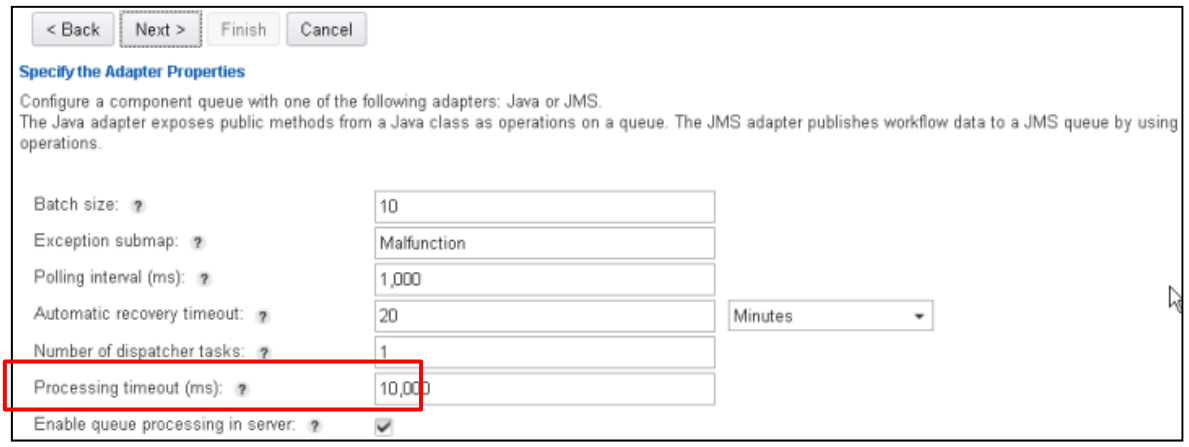


Figure 1-35. Stopping and starting component queues F2361.0

Notes:

Help path

Migrating to the IBM FileNet P8 5.2 Component Manager Framework technote: Section: Stopping and Starting a Component Queue

The new component queues are started automatically as soon as they are created. Updates are applied as soon as the changes are saved.

To stop a new component queue:

a. Open the component queue in the Administration Console for Content Platform Engine.

b. In the Adapter tab, clear the “Enable queue processing in server” check box.

c. Save the changes.

Note

The status of the component queue displays as Terminated, in the Component Manager Logs. The reason that it displays as Terminated, and not Stopped, is that in the new Component Manager Framework, all work on the Content Platform Engine server is classified as tasks that run in threads. To stop the operations from running in a component queue, the corresponding tasks are terminated so that they do not run in the threads. The next few slides cover the Component Manager Logs and the information the logs provide.

Create and configure component queues

Diagnosing Component Manager issues

- Process Services ping page
  - http://<*CPE_server*>:<*port*>/peengine/IOR/ping

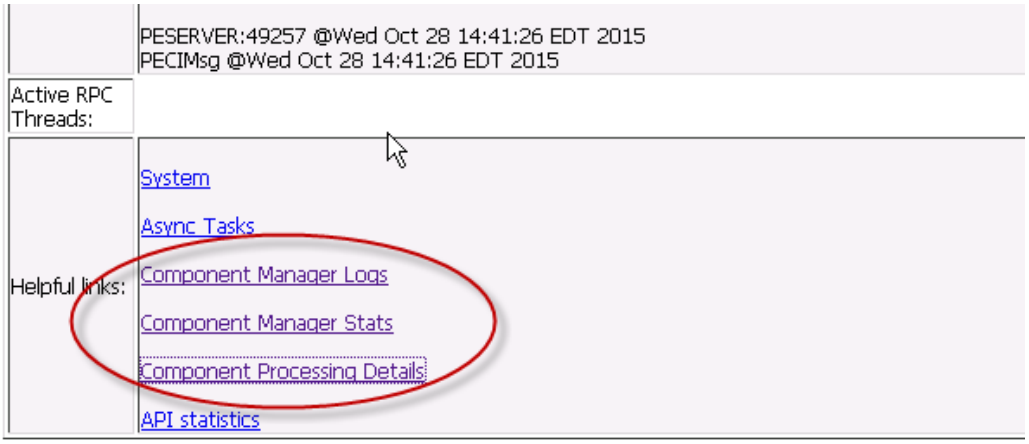


Figure 1-36. Diagnosing Component Manager issues F2361.0

Notes:

Help path

Migrating to the IBM FileNet P8 5.2 Component Manager Framework technote Section: Managing the New Component Queues

The Process Services ping page provides useful information to help you monitor and maintain component queues.

The diagram shows the output of the Process Services ping page. When you scroll to the bottom, three Component Manager links are circled in red.

Information

In a cluster environment, if you use the cluster name in the PE ping URL, then each time you run the PE ping, you might connect to different servers in the cluster. The information returned might be different. You can go to the PE ping page for a specific server.

In the next few slides, you see what each of the links provides.

Create and configure component queues

Component Manager Log

- Running log stored in memory.
- Includes information for a FileNet P8 domain:
  - All the component queues in all the connection points
  - Spans multiple workflow systems

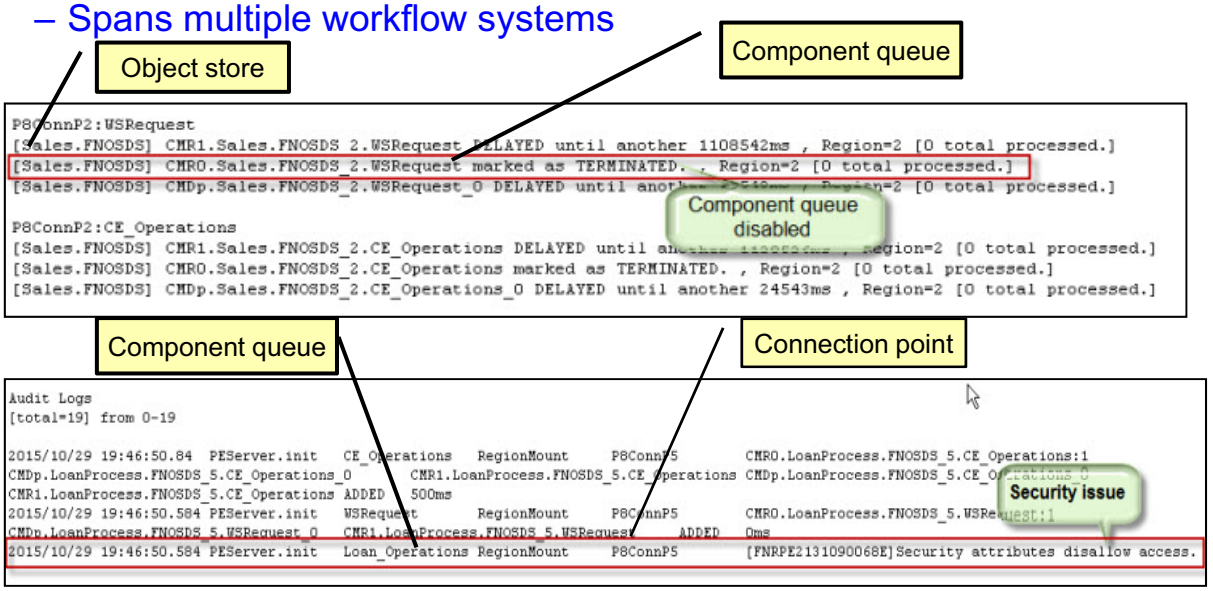


Figure 1-37. Component Manager Log F2361.0

Notes:

The Component Manager Log, is a running log of the status of the component queues, which are stored in memory.

The log includes, all the connection points and all the component queues defined in the associated isolated region of a FileNet P8 domain. The log can span multiple workflow systems.

The screen captures show a couple of snippets of a sample Component Manager Log.

- The first snippet shows the component queue, WSRequest, in the object store, Sales, with a status of Terminated, which indicates that the component queue is not enabled or configured.
- The second snippet shows a security issue in the component queue, Loan_Operations in the connection point, P8ConnP5. The JAAS user name that is configured for the Java Adapter does not have the required rights to run the operation.

The log includes the following type of information:

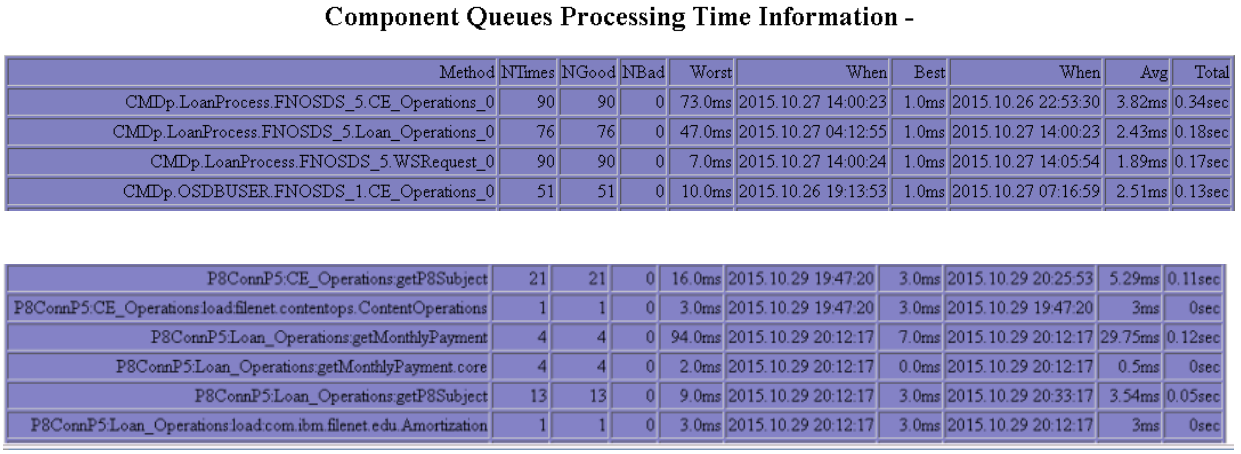
- Status of a component queue.
  - Terminated indicates that the component queue is disabled.

- Number of items that are waiting to process in a component queue.
- Execution details of items processed.
- Issues with a component queue, for example a JAAS user not having the proper security rights.

Create and configure component queues

Component Manager Statistics

- Statistical information captured for the component manager.
- Provides:
  - Processing times for each of the component queues



Component Queues Processing Time Information -

Method	NTimes	NGood	NBad	Worst	When	Best	When	Avg	Total
CMDp.LoanProcess.FNOSDS_5.CE_Operations_0	90	90	0	73.0ms	2015.10.27 14:00:23	1.0ms	2015.10.26 22:53:30	3.82ms	0.34sec
CMDp.LoanProcess.FNOSDS_5.Loan_Operations_0	76	76	0	47.0ms	2015.10.27 04:12:55	1.0ms	2015.10.27 14:00:23	2.43ms	0.18sec
CMDp.LoanProcess.FNOSDS_5.WSRequest_0	90	90	0	7.0ms	2015.10.27 14:00:24	1.0ms	2015.10.27 14:05:54	1.89ms	0.17sec
CMDp.OSDBUSER.FNOSDS_1.CE_Operations_0	51	51	0	10.0ms	2015.10.26 19:13:53	1.0ms	2015.10.27 07:16:59	2.51ms	0.13sec
P8ConnP5:CE_Operations:getP8Subject	21	21	0	16.0ms	2015.10.29 19:47:20	3.0ms	2015.10.29 20:25:53	5.29ms	0.11sec
P8ConnP5:CE_Operations:load:filenet.contentops.ContentOperations	1	1	0	3.0ms	2015.10.29 19:47:20	3.0ms	2015.10.29 19:47:20	3ms	0sec
P8ConnP5:Loan_Operations:getMonthlyPayment	4	4	0	94.0ms	2015.10.29 20:12:17	7.0ms	2015.10.29 20:12:17	29.75ms	0.12sec
P8ConnP5:Loan_Operations:getMonthlyPayment.core	4	4	0	2.0ms	2015.10.29 20:12:17	0.0ms	2015.10.29 20:12:17	0.5ms	0sec
P8ConnP5:Loan_Operations:getP8Subject	13	13	0	9.0ms	2015.10.29 20:12:17	3.0ms	2015.10.29 20:33:17	3.54ms	0.05sec
P8ConnP5:Loan_Operations:load:com.ibm.filenet.edu.Amortization	1	1	0	3.0ms	2015.10.29 20:12:17	3.0ms	2015.10.29 20:12:17	3ms	0sec

Figure 1-38. Component Manager Statistics F2361.0

Notes:

The Component Manager Statistics displays the statistical information captured for the component manager.

The statistics provide processing times for all the component queues.

- NTimes is the number of times the component queue is called.
- NGood is the number of times the operation completes successfully.
- Nbad is the number of times the operation fails.
- Worst is the longest performance time for the operation to complete.
  - When is the time when the worst performance occurred.
- Best is the shortest performance time for operation to complete.
  - When is the time when the worst performance occurred.
- Avg is the average performance time to complete the all the operations.
- Total is the total performance time for all the operations.

Create and configure component queues

Component processing details

- Shows the information for components that are enabled and processing.
- Quick way to verify the component queues that should be operational.

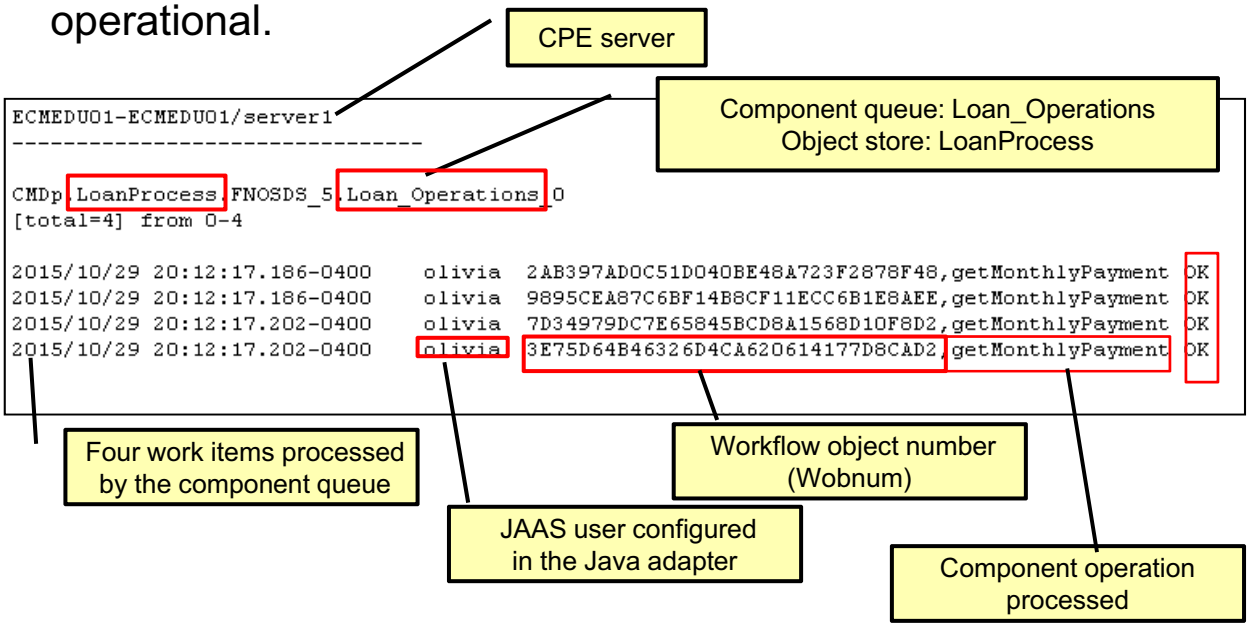


Figure 1-39. Component processing details F2361.0

Notes:

The Component Processing Details log displays information for only components that are enabled and processing.

This log provides a quick method to verify the component queues that should be operational.

The screen capture shows a sample Component Processing Log.

You see:

- On the top, the Content Platform Engine server
- In the center:
  - The name of the object store, LoanProcess.
  - The name of the component queue, Loan_Operations.
- On the bottom:
  - The component queue processed four work items.
  - The JAAS user name configured on the Java adapter of the component queue, Olivia.

- The workflow object number.
- The operation that was processed, getMonthlyPayment.
- The OK on the far right, indicates that the operation completed successfully.

Create and configure component queues

Demonstrations

- Create and configure a Java component queue.
- Examine the Component Manager logs.

Figure 1-40. Demonstrations F2361.0

Notes:

Demonstration notes

Create and configure a Java component queue.

1. Create a code module for the Java component.
   a. Use Administration Console for Content Platform Engine.
   b. Select Object Stores > LoanProcess > Browse > Root Folder > CodeModules
   c. Actions >New Document
      - Document title: Amortization
      - Class: Code Module
   d. Click Next.
   e. Under Content Elements, click Add.
      - Browse to: C:\Labs\Case Foundation 5.2.1 Administration\Component Integration\Amortization.jar

- Click Add Content.

f. Click Next, until you get the Summary window, then click Finish.

2. Create the Java component queue.
   a. Right-click Component Queues and select New Component Queue.
   b. Complete the wizard by using the following data:
      - Name: Loan_Operations
      - On the Configure the Java Adapter window: Code Module: Click Load Existing.
      - Select the code module, Amortization.
      - On the Adapter Properties window, change the polling interval to: 60000.
      - On the JAAS Credentials window:
        - Oscar/filenet
        - Leave the Configuration context blank, you do not need it because the component uses CELogin.
   c. Click Next.
   d. Review and click Finish.
3. Import the component queue operations.
   a. Open Process Configuration Console: Right-click Workflow System and select Configure Workflow Settings.
   b. Double-click P8ConnP5.
   c. Select Component Queues.
   d. Open the Loan_Operations component queue.
   e. Select the tab, Operations, and click the Import icon.
      - Select the method, getMonthlyPayment.
      - Click OK.
   f. Rename the parameters as follows:
      - param1: LoanAmount
      - param2: InterestRate
      - param3: LoanTerm
      - return_value: MonthlyPayment
   g. Click OK.
   h. Commit the changes.

Examine the Component Manager logs.

1. Open the Process Services ping page, http://ecmedu01:9080/peengine/IOR/ping.
2. Log in as p8admin/IBMFileNetP8

3. Scroll down to the bottom of the page.
4. Examine the Component Manager logs and select to open the link in a new tab.
   a. Right-click the link, Component Manager Logs.
   b. Notice the three components listed, WSRequest, CE_Operations, and the component queue you created, Loan_Operations.
   c. Need to scroll to the bottom of the screen to compare results after launching the workflow.
5. Examine the Component Manager Statistics.
   a. Right-click the link, Component Manager Stats and select to open the link in a new tab.
   b. Select the new tab.
   c. Examine the row for the component queue Loan_Operations.
6. Examine the Component Processing Details.
   a. Right-click the link, Component Processing Details and select to open the link in a new tab.
   b. Select the new tab.
   c. Examine the row for the component queue Loan_Operations.

Create and configure component queues

Exercise introduction

Create and configure a Java component queue.

- In this exercise, you will:
  - Create a code module for the Java component.
  - Create a Java component queue.
  - Import the component queue operations.
  - Set security on the component queue.

Verify the Java component queue.

- In this exercise, you will:
  - Verify the component queue with the Process Services ping page.
  - Verify the component queue configuration with vwtool.
  - Verify the component queue functionality.
  - Examine the Component Manager logs.

Figure 1-41. Exercise introduction F2361.0

Notes:

There are three exercises that you need to complete for this lesson.

Exercise 1: You learn how to create and configure a Java component queue (New Component Manager Framework).

Exercise 2: You learn about the tools available to verify the component queue that you create in exercise 1. You learn how to read the Component Manager logs to help you monitor and maintain the component queues.

Create and configure component queues

Exercise introduction (2)

Stop the component queue and examine the Component Manager logs.

- In this exercise, you will:
  - Stop the component queue, Loan_Operations.
  - Check the Component Manager logs.
  - Start the component queue and check the Component Manager logs.

Figure 1-42. Exercise introduction (2) F2361.0

Notes:

Exercise 3: You learn how to stop and start the component queue and see the output generated in the Component Manager logs.

Create and configure component queues

Activities

In your Student Exercises

- Unit: Unit name
- Lesson: Lesson name
- Activities:
  - Create and configure a Java component queue.
  - Verify the component queue.
  - Stop and start the component queue.

Figure 1-43. Activities F2361.0

Notes:

Use your Student Exercises to perform the activities listed.

IBM Case Foundation 5.2.1: Component integration

Unit summary

Having completed this unit, you should be able to:

- Understand the purpose of component integration in workflow applications.
- Create and configure component queues.

Figure 1-44. Unit summary F2361.0