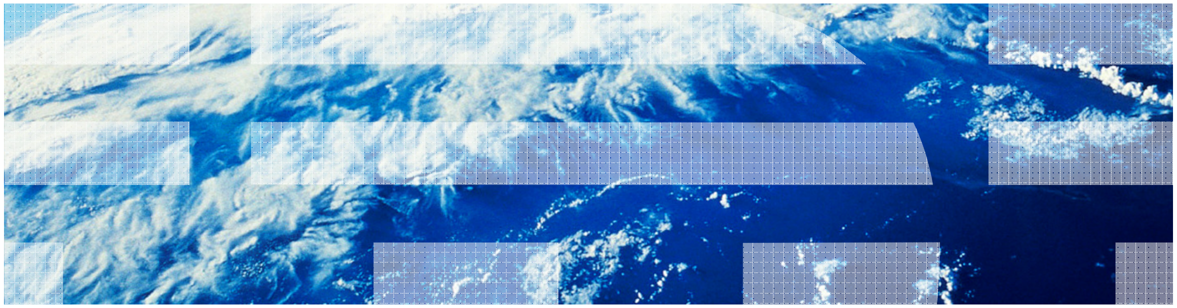
Solution Builder and Administrator

IBM FileNet Content Manager

Automating Actions on Content Objects



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6.0

Event and subscription terms

- Event action
  - Identifies an event action handler (a Java class) that runs when an event is triggered on a target object
- Event
  - A change in object metadata that initiates an event action when this change is specified in a subscription
- Trigger event
  - A specified action on an object in an object store
- Subscription
  - Specifies a set of conditions (a specific trigger event on a specific class or object) that is required to start a specified event action.
- Content Engine event
  - An event action available for use as trigger events or specified actions
  - A custom event action can also be used.

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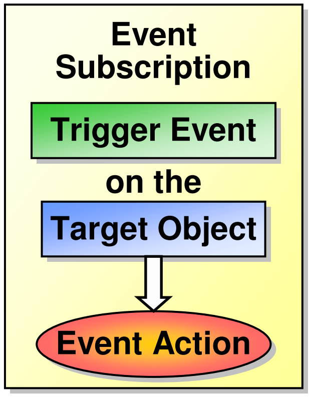
What are event subscriptions?

- Event subscriptions cause the Content Engine to do work:
  - Example: Run an event action and possibly launch a workflow.
  - Work occurs when a trigger event happens to a target object.
- The event action is a custom Java class.
  - Examples: launch a workflow, file an object, delete an object
- The trigger event is a Content Engine or custom event.
  - Examples: Document add, checkout, or delete
- The target object is a Content Engine object.
  - A document, folder, or custom object class, or an instantiated class object
  - Can include subclasses.
  - Expressions limit the scope of the subscription.


Event Subscription

Trigger Event

on the

Target Object

Event Action

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Workflow subscriptions

- Workflow subscription:
  - Starts the Workflow event action, which launches a workflow.
  - Specifies a workflow in addition to specifying the trigger event, target object, and event action.
  - The workflow definition must exist in the object store and the workflow database on Process Engine.
- Example
  1. Trigger event: A document is added.
  2. Event subscription: Triggers an event action.
  3. Event action: Run by the Content Engine.
  4. Specified workflow: Launched by Content Engine.

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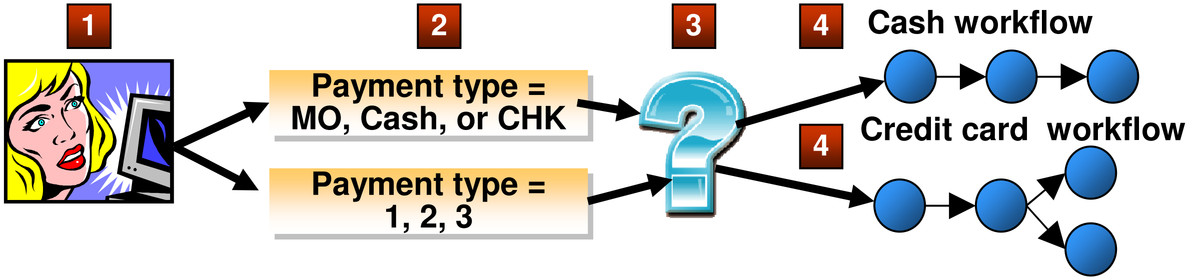
Expressions in event subscriptions

- Filter Expression
  - Determine whether the subscription needs to run.
  - If the expressions are complementary, one workflow is launched and the other workflow is not launched.
- Order example:
  - Step 1: A customer orders product with credit card, payment type 1.
  - Step 2: Two event subscriptions exist for Order object creation.
  - Step 3: Match payment type to expression conditions.
  - Step 4: Expression condition launches correct workflow.



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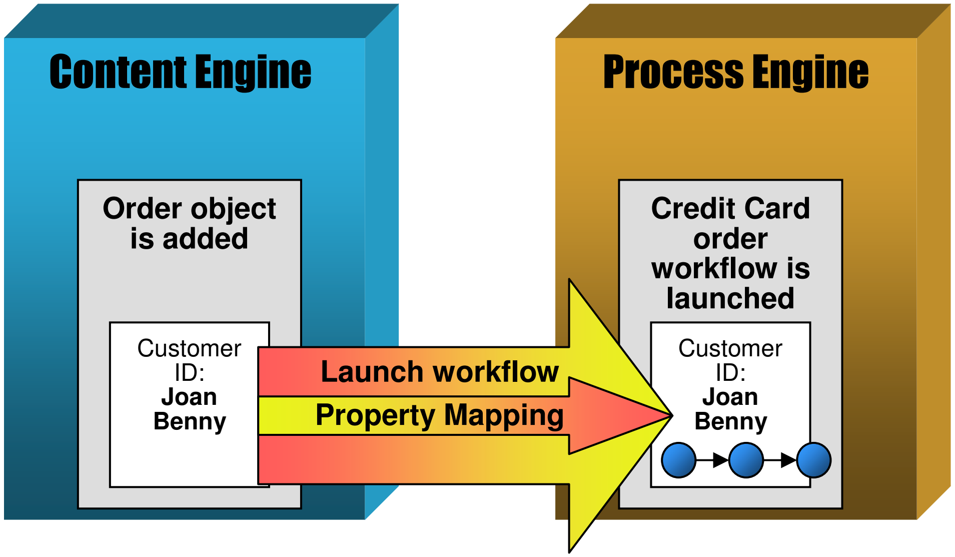
Launching workflows: property mapping

- Event subscription
  - When an event subscription launches a workflow, property mapping provides the workflow with information.
  - The object properties are mapped to workflow properties.



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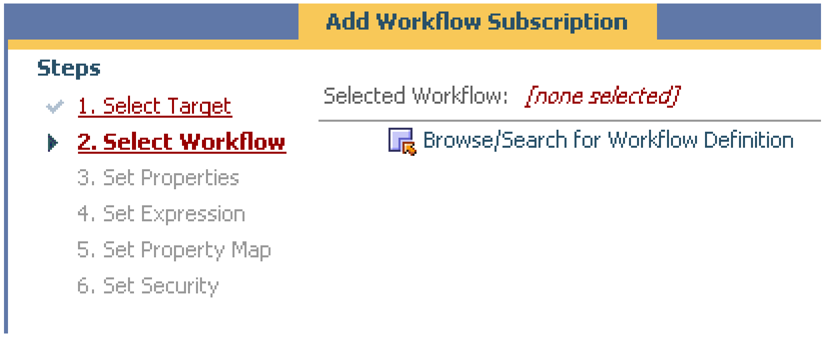
Create a subscription

- You can create subscriptions in both utilities:
  - Enterprise Manager.
    - Enterprise Manager > object store > target > Add Subscription. Then select the Workflow check box for a workflow subscription.
  - Workplace XT (workflow subscriptions)
    - Tools > Advanced Tools > Workflow Subscription > Add



Add Workflow Subscription

Steps

✓ 1. Select Target

2. Select Workflow

3. Set Properties

4. Set Expression

5. Set Property Map

6. Set Security

Selected Workflow: *[none selected]*

Browse/Search for Workflow Definition

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Applying a filter to an event subscription

- Subscription scope
  - To restrict the application scope of a subscription, create a filter.
    - For example, restrict the scope to documents in class Memorandum with the security level setting: *SecurityLevel = 'Confidential'*
  - You can also filter on filing operations.
- Creation event
  - Occurs when a user adds a document or checks out a document.
  - If you want to do something **only** when adding a new document, you have to filter out the Creation event caused by a checkout.

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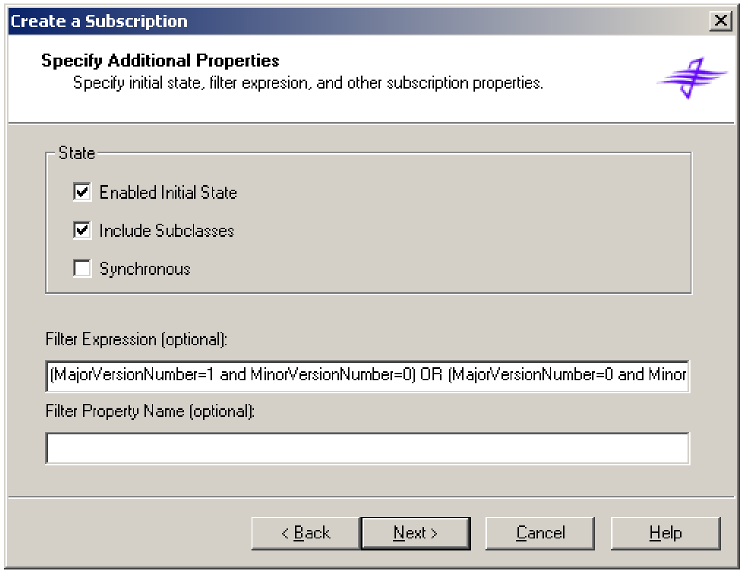
Define subscription filter

- Use the Create a Subscription wizard to specify a filter.
- Filter out Creation events triggered by Checkout operation:

```
(MajorVersionNumber=1 and MinorVersionNumber=0) OR
(MajorVersionNumber=0 and MinorVersionNumber=1)
```



Specify Additional Properties

Specify initial state, filter expression, and other subscription properties.

State

☑ Enabled Initial State

☑ Include Subclasses

☐ Synchronous

Filter Expression (optional):

(MajorVersionNumber=1 and MinorVersionNumber=0) OR (MajorVersionNumber=0 and Minor

Filter Property Name (optional):

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Update event action with new code module version

- If you modify the code for a Java event action handler contained within a code module:
  - You must update any event actions referencing the code module.
- Steps to update:

1. Check out the code module.
2. Modify the Java event action handler source and compile.
3. Check in the code module with the new version of the Java class.
4. Copy the object reference for the code module.
5. Update the Code Module property of the event action by pasting the object reference.

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Adding external JAR files to the Content Engine

- JAR files
  - Some event actions might require external JAR files.
- Adding JAR files
  - Add as content elements of the code module.
    - Imported with the Content Engine objects
  - Copy to the application server or set in the classpath.
    - Globally available for the other event actions

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Steps to analyze event subscriptions

1. General tab:
   - Identify a target class and the event action to be launched.
   - Note: Workflow subscriptions do not have an event action.
2. Subscribed Events tab:
   - Identify the subscribed trigger events.
   - The Subscribed Events field lists the subscribed trigger events.
     - Click Add to access the list of available trigger events and to add more trigger events.
3. WorkFlow tab:
   - Select and configure the workflow to be launched.
     - Workflow Event Action field: name the event action.
     - Workflow Definition field: select the workflow.
     - Property Map field: map object properties to workflow properties.

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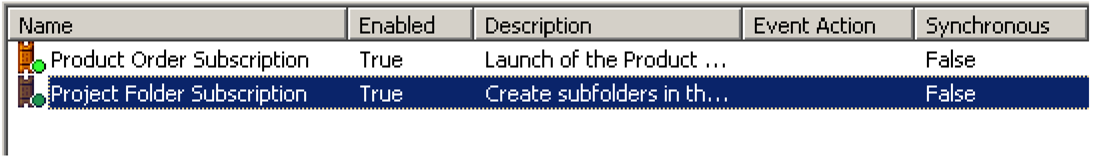
Example: Project Folder subscription properties

- General tab
  - – Target ID: Project
  - – Event Action: CreateProjectSubfolders
- Subscribed Events tab
  - – Creation Event
- Security tab
  - – Type, Level, Apply To, and Rights options (users or groups)
- Configuration tab
  - – Enabled



Name	Enabled	Description	Event Action	Synchronous
Product Order Subscription	True	Launch of the Product ...		False
Project Folder Subscription	True	Create subfolders in th...		False

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Disabling subscriptions

- You can disable a subscription without deleting it.
  - – Use disable for testing.
    - Disable the event subscription while you fix the problem.
    - After you change the event action, re-enable the subscription.
  - – Deleting is permanent, but disabling is temporary.
- Disabled subscriptions
  - – Enabled column displays the value *False*.

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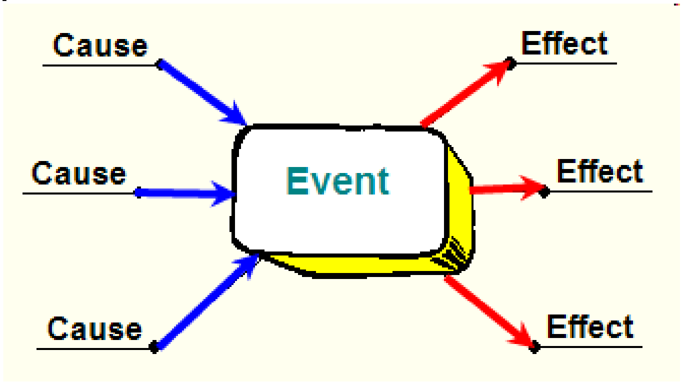
Steps to create an event action

- Event Actions must be written in Java.

  Procedure

  1. Create an event handler Java class.
  2. Compile the Java code to get the class file.
  3. Optionally, create the JAR file.
     a. In Enterprise Manager, create an event action object.
     b. Assign the event action to a subscription.
  4. To create an event action:
     a. Specify the Event Action Handler Java class name.
     b. Load Java class files or JAR files as code module content elements.



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Code modules

- Code modules
  - Represent user-implemented Java event handlers.
  - Are implemented as a Java class or JAR file on the Content Engine.
  - Execute when an action-based event is raised on Content Engine objects.

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Debugging

- What can go wrong
  - Errors in Java classes
  - Missing Java classes
- Debugging
  - See log file for errors: *<Application server>*\FileNet\server1\p8_server_error.log

```
com.filenet.api.exception.EngineRuntimeException: EVENT_HANDLER_THREW: The Event handler threw an
      exception.
      at com.filenet.engine.queueitem.SubscriptionProcessor.executeHandler(SubscriptionProcessor.java:802)
      at com.filenet.engine.queueitem.SubscriptionProcessor.execute(SubscriptionProcessor.java:658)
      at com.filenet.engine.queueitem.SubscriptionProcessor.execute(SubscriptionProcessor.java:619)
      at com.filenet.engine.queueitem.EventQueueItemHandler.execute(EventQueueItemHandler.java:75)
      .
      .
      .
Caused by: java.lang.NoClassDefFoundError: com/ibm/filenet/gls/LogOperation
      at com.ibm.filenet.gls.LogAction.onEvent(LogAction.java:22)
      at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
      at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java(Compiled Code))
      at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java(Compiled Code))
      at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java(Compiled Code))
      at java.lang.reflect.Method.invoke(Method.java(Compiled Code))
      at com.filenet.engine.queueitem.SubscriptionProcessor.executeHandler(SubscriptionProcessor.java:790)
```

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What is auditing?

- Auditing is the automatic or programmatic logging of actions performed on an object or class.
  - Applications can create custom audit classes.
- Use security auditing to identify access actions.
- Use activity auditing to trace the history of an object.
  - Most objects can be audited.
- Content Engine can automatically log performed operations.
  - You can configure auditing for an object store, class, or operation.
- The audit history shows actions performed on an object.
- You can search for audited events on the following:
  - On the object itself
  - Across objects in the object store

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Why audit?

- You configure auditing in order to gain information about Content Engine objects
- For example:
  - How often was this document accessed?
  - When did this property value change?
  - Who made the change?
  - Who deleted that document?
- Additional examples of other data that you can record:
  - Everything that ever changed on this document
  - Every time something was filed in a folder
  - When a user tries to open a document to which he does not have read access
  - Every time a document is opened

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Object operations that you can audit

- Change operations
  - Create, update, delete
  - Checkin, checkout, promote and demote versions, cancel checkout, last accessed
  - Change class, classification complete
  - Lifecycle change state
  - File and unfile
  - Update security
  - Property value updates
- Retrieval operations
  - Object retrieved (Get Object)
  - Object content retrieved (Get Content)
  - Queries by class (Get Query)
- Audit configuration operations
  - Auditing enabled or disabled

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Audit entries

- Audit entries are stored as objects in object store databases.
  - They can be searched for, exported, and so on.
- Each entry is a subclass of the Event class.
  - Each automatic operation has an Event subclass.
  - CheckinEvent is an Event subclass.
- Each subclass has additional, operation-specific properties.
  - Version Series Id is a property for check in and check out, which are versioning operations.
  - Containment Name is a property for file and unfile, which are folder operations.
- Object state recording level options include the following:
  - None
  - Modified object only
  - Original and modified objects

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Audit definition extensions

- Filter Expression
  - Audit events conditionally based on specific source object instance data. Functionally equivalent to subscription filtering. For example, Audit update events when AccountBalance < 1000, set Filter Expression = “AccountBalance < 1000.0”
  - Filtered Property Name - points to object-valued property of source object against which filter expression is evaluated
- Named Audit Definitions
  - Enables administrator to identify application-specific audit definitions – purely informational.
- Fine-grained Enablement
  - Enables per-application audit definition usage.
  - Can start or stop auditing for a specific event and class without having to re-create audit definition.

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Steps to audit events

1. Enable auditing for the object store.
   - Use Enterprise Manager.
2. Configure auditing for class.
   - Use Enterprise Manager to set Success or Failure for audit definitions.
3. Generate events.
   - Perform actions on object (for example, create or update).
4. Find audit events.
   - Workplace: object Information > History page
   - Enterprise Manager: Properties > Audit History tab
   - Enterprise Manager: Query Event table

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Additional Slides on Auditing

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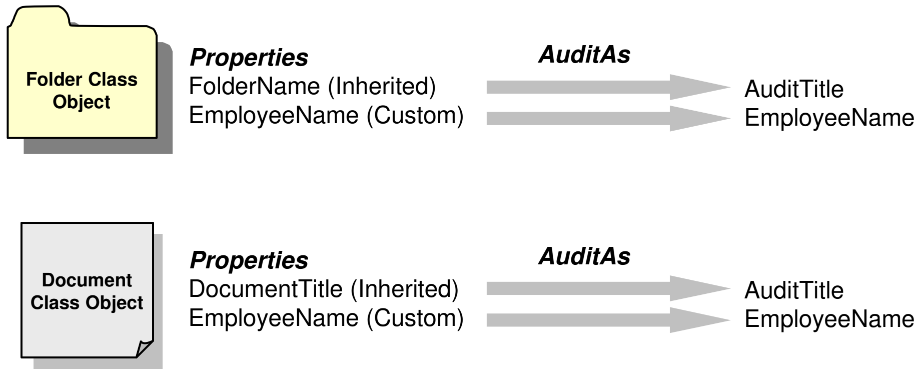
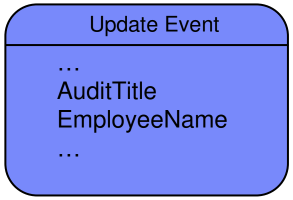
Audit Properties – example



- Use the *AuditAs* object-valued property to map properties as shown for each class.
- Add *AuditTitle* and *EmployeeName* property definitions to *UpdateEvent* Class.
- Configure update event audit definition on each class.
- Trigger update events on objects results in property values captured in Event table (along with default event properties).



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Viewing audit history

- You can view the audit information for an object from Workplace XT and from Enterprise Manager.
  - Both provide audit information in the Properties page of the object.
- In Workplace XT, use the History page of the Information pages.
  - Search for history audit events for a document, custom object, or folder.
  - Searches can include all versions and all referenced objects.
- You can view details of an audit log entry.
  - Use the Information page in Workplace XT.
  - View the Properties window in Enterprise Manager.

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Audit disposition

- An audit disposition subsystem automates deletion of event records from the audit log.
  - Runs as a background task.
- Audit Disposition Policy
  - Defines *what* gets deleted.
  - Example: Update Events older than 90 days
- Auditing configuration schedule
  - Determines *when* the audit policies are executed.
  - Example: Saturdays at hour 22:00
- Manual audit log disposal options include the following:
  - Predefined search templates
  - Bulk operations

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