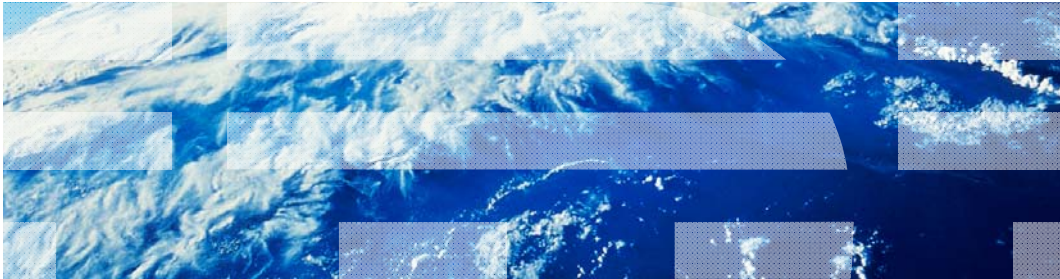




IBM Operational Decision Manager V8.0.1

Events enhancements



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The goal of the presentation is to provide an overview of the enhancements made to events runtime and tools in IBM Operational Decision Manager V8.0.1.

Agenda

- JDBC action connector enhancements
- Event widgets repackaging
- Context management
- Context interface added to Decision Center
- Business object enrichment enhancements

Shown here is the agenda of the presentation. The presentation covers the enhancements made to JDBC action connector to support batching of multiple actions. Other enhancements also covered in this presentation are the changes to event widgets, support for context management and changes to how to enrich a business object.

Events – JDBC action connector

Single unit-of-work for multiple JDBC actions

- Motivation
 - Previous behavior - Each action in a rule processed individually
 - All actions from an event should be processed in a single transaction, so that all succeed or all fail
- Areas of enhancement:
 - JDBC action connector enhanced to process multiple actions in a rule or rule group in one transaction
 - This behavior is the default
 - Restriction → Actions that are sent after a delay are not combined into a single unit of work.
 - To process each action individually
 - Check the option “process this action in its own unit of work” in action’s connector properties panel

In versions before IBM Operational Decision Manager V8.0.1, if a rule has multiple actions defined, each one of these actions are treated as individual entities and there was no way to group them as a single unit of work. In V8.0.1, the default behavior when you have multiple actions defined in the rule is to treat them as a single unit of work and process them as part of one transaction. So if one of the actions fails for any reason, all of the changes made in the database are rolled back. You can change the default behavior and treat each action as its transaction by selecting the check box next to the option “process this action in its own unit of work” exposed at the action’s connector properties panel.

Events – Widget repackaging

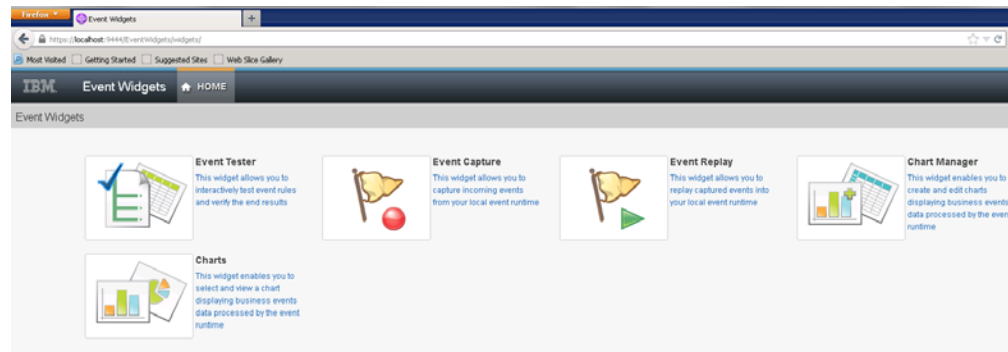
Event widgets no longer in Business Space

- Motivation:
 - Simplify installation and remove business space as a prerequisite
- Areas of enhancement:
 - Event testing, simulation and charts widgets provided as DOJO components
 - Launchpad and Installation Manager updated to not include business space

In previous releases, the event widgets for testing, simulation and charting were implemented using business space. This made the business space capability of WebSphere Application Server a prerequisite for using the event runtime. By changing the widgets to be implemented as Dojo components, business space is eliminated from the product launchpad and installation manager.

Events – Widget repackaging

- How to access the event widgets
 - <http://hostname:port/EventWidgets>



Shown here in this slide is a screen capture of the new event widgets. The URL for accessing the event widgets is also provided here. Hostname in the URL should be replaced by the name of the host on which the Decision server is installed and running. Port is the port number of *WC_defaulthost* if security is off, typically 9080, or *port* is the port number of *WC_defaulthost_secure* if security is on, typically 9443. The functionality provided by this widget has not changed from the previous versions.

Events – Context management

- Implementation in versions before V8.0.1
 - No way to differentiate context data of events/actions with different context IDs that evaluate to the same value
 - context instance never ends, and everything in the context instance is saved
 - All occurrences of events and actions in the context are saved
 - All this result in
 - a single context state which is continually captured and grows without bounds
 - excessive resource utilization
 - performance impact to extracting relevant active data from the context data set

Shown here are some of the short comings of the way context is handled in versions before V8.0.1.

There is no concept of distinct context definitions, just context instances that are identified by the value of the Context ID field specification. It is easy to mistakenly assume the field specification is defining a context definition. For example, the context ID specification of “order number” in one rule and of “line number” in another rule means that there’s an “order number” context definition and a “line number” context definition. However, this is not the case. If these fields evaluate to the same data value, they are assumed to be part of the same context instance.

Also there is no concept of context characteristics: start, end, and size. The context instance starts as soon as a rule is processed which is associated with a context instance. The context instance never ends, and everything that has happened in the context instance is saved forever and can participate in correlation evaluations. All events and actions occurring in the context instances are stored, regardless of whether they are required for time-based correlations or not.

The net result is a single context state which is continually captured and grows without bounds. This results in both excessive resource utilization, and reduced performance of extracting relevant active data from the context data set.

Events – Store state information selectively



New in V8.0.1

- Not all events and action state information is stored
 - Data for events or actions that do not participate in complex filter evaluations is not saved
 - Reduce utilization of system resources by not saving state data that is not required by the application
 - Reduction in database actions which improves system performance

As discussed in the previous slide, the IBM Operational Decision Manager versions before V8.0.1 retain event and action occurrence information for any event or action that occurs in a context. For events or actions that do not participate in complex filter evaluations, this data is not required. In V8.0.1, only those event's and action's data that participate in the complex rules is saved and the rest are ignored.

Advantages of the implementations are to reduce utilization of system resources by not saving state data that is not required by the application and increased database and system performance by eliminating un-necessary data read and writes to the databases.

Events – Context management



New in V8.0.1

- Addition of a new concept called context definition
 - Enables better management of the life cycle of a context instance
 - Contains a list of events, each with an associated context ID
 - Same event can participate in multiple Context Definitions with different Context IDs
 - Associated with an event rule
 - Only one context definition per event rule
 - Application can contain multiple context definitions
 - Helps isolate context instances with identical context-ID values
 - Better separation of context
 - Not mandatory to have context definition
 - Event rules can be set to system context and identify a business object field as context id

In IBM Operational Decision Manager V8.0.1, a new asset type called context definition is introduced which helps with the management of context state which include the start and end of the context instance.

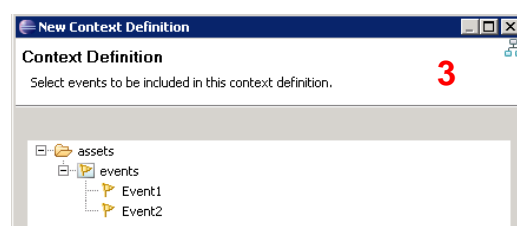
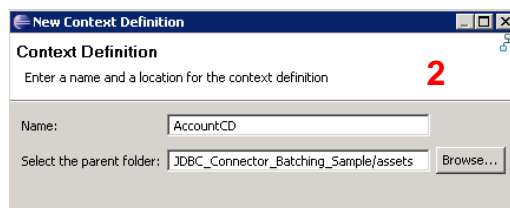
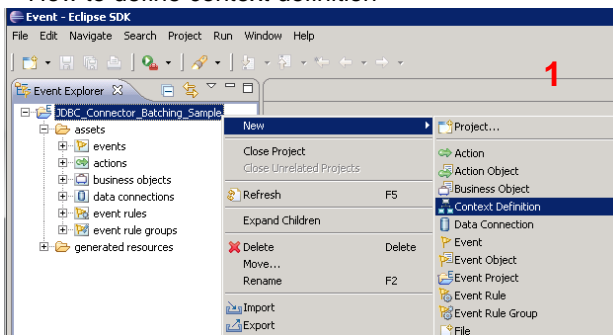
Context definition is a collection of events and their associated context IDs used for complex processing by Decision Server Events. An event project can have one or more context definitions. Once a context definition is created and events context ID's are specified, you can associate the context definition with an event rule.

Even though an event project can have multiple context definitions, you can only have one context definition with an event rule. Once defined the rule and the actions fired by those rules are added to the context definition.

Context definitions resolve the problem of not being able to isolate context instances with identical context-ID values that existed in previous versions. You can now separate the context IDs that may resolve to same values by placing them in different context definitions. It is not mandatory that you have to use context definition in your event project. You can still have events with no context or define a context ID at the event rule scope without using context definitions. When you choose to specify a context ID at the event rule instead of using a context definition, you need to set the context definition to System Context and then select the context ID. System context is a global context definition that exists by default and can be used when you want to define the context ID at the event rule.

Events – Create context definition

▪ How to define context definition



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Events Enhancements

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Shown here is one way to create a context definition. Select and right click the project in which you want to create context definition. Choose the option “Context Definition” available in the New menu. You are prompted to enter the name and select the location under which you want to create the context definition. You will also be able to select the events you want to add to this context definition.

Events – Create context definition

The screenshot illustrates the process of creating a context definition and editing an event. It shows three windows:

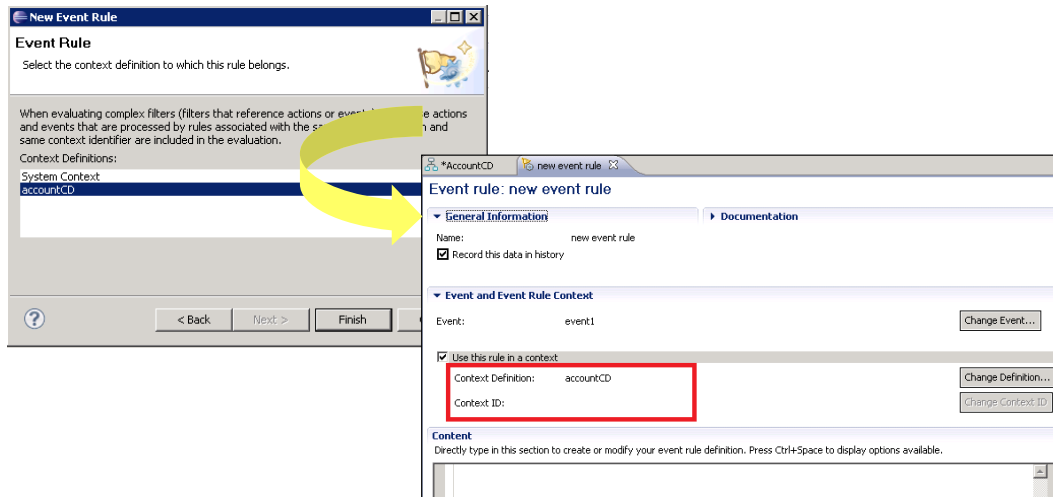
- Context Definition: AccountCD (Top):** Shows the initial state with "Context ID" set to "Undefined" and "Terminate After" set to "no". A red box labeled "1" highlights the "Verbalization" section.
- Edit Event (Middle):** A dialog box titled "Edit Event" with the instruction "Choose context ID and termination settings for the selected event". It shows "Event Name" as "Event1" and "Context ID" as "the COLUMN1 of the businessObject1". A red box labeled "2" highlights the "Context ID" dropdown.
- Context Definition: AccountCD (Bottom):** Shows the final state where the "Context ID" for "Event1" is updated to "the COLUMN1 of the businessObject1". A red box labeled "3" highlights the "Verbalization" section. A yellow callout bubble says "You can add multiple events here".

At the bottom left, the text "10 Events Enhancements" is visible.

Once the context definition is created, you can double click the context definition name which should open the asset. You can edit the list of events associated with the context definition and set context IDs for the list of events already added. As part of the selection of context ID for an event you will see an option to set it as the terminating event for the context. Details on how to manage context are covered later in this presentation.

Events – Associate context definition with event rule

- Context definition can be associated with the event rule at rule creation time
 - Create a new event rule
 - Select the event you want to associate the rule with
 - Select the context definition the event is part of



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Events Enhancements

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Once the context definition is created, it is now ready to be associated with event rules. You can associate the context definition with event rule as part of the creation of event rule or after creation of event rule. As part of event rule creation, you are prompted to associate the event rule with the global system context or any of the context definitions you have created. You can add or modify the context definition after the event rule creation by using the Change definition button shown here in the event rule panel.

Context management - Manage context life cycle

- Remove data that is not needed anymore for event processing
 - based on user settings at context definition
- Context retention
 - When an Action/Event state is only required for some set amount of time.
 - Retain state information for a specified amount of time
 - Context is not terminated
 - Only state information related to actions/events deleted
- Context termination
 - can be by time
 - or by incoming event
 - all state information associate with that instance (events, actions, context-specific business objects) is freed

Context Definition: AccountCD

▼ General Information
Name: AccountCD

▼ Events in this Context
You can add new event conditions for this context definition and set whether or not the event terminates the context.

Event Name	Context ID	Terminate After
Event1	the COLUMN1 of the businessObject1	no

▼ Termination
Select the criteria by which this context definition will be ended.

Current termination setting:
Don't end by time

Don't end by time [Edit]

Don't end by time

End after a duration of time

End after a duration of inactivity

End on every repeating interval

▼ Retention
Removing expired context information may improve performance.

Retain state information for specified amount of time

[ID] [Days]

With V8.0.1, you now have the ability to manage the context data associated with events. The conditions for the context termination and duration for which the data is stored can set using context definition. Details on termination and retention and settings available are discussed in the next couple of slides.

Context management – Termination by time

- Context termination
 - Default option is “don’t end by time”
 - End after duration of time
 - Weeks, days, Hours, minutes
 - End after duration of inactivity
 - Weeks, days, Hours, minutes
 - End on every repeating interval
 - Hourly, daily, weekly, monthly

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Events Enhancements

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Context can be terminated by time or by arrival of an event. Shown here are some of the options for terminating context by time. By default the context termination on the context definition is set to “Don’t end by time.” You can change that to end after duration of time, end after duration of inactivity or end on repeating interval.

The context instance starts as soon as a rule is processed which is associated with a context instance. The following conditions determine how long the context is kept active from the start of context instance.

When you choose the option to end context after a duration of time, you can set the number of weeks, days, hours or seconds for which you want to keep the context active for that context instance

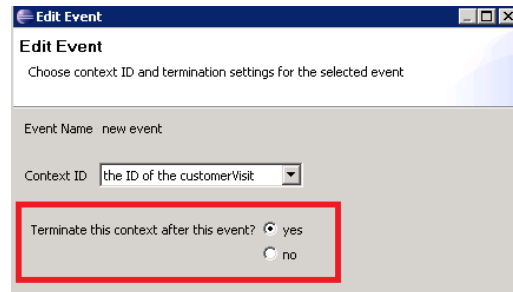
End after duration of activity provides option to provide the values for weeks, days, hours or seconds. The context ends if no events or actions are processed within the specified time after the last activity for that context instance.

End on repeating interval provides option to configure the intervals which can be hourly, daily, weekly or monthly. Each one of these options can be fine tuned. For example, if you choose the option of weekly, you can select the day of the week, hour of that selected day and minutes past the specified hour .

Once the duration specified is reached, all the state information for events, actions and context-scoped business objects(CSBO) associated with that instance are freed and the storage recovered. The context instance ends immediately from the applications point of view. Any internal garbage collection tasks that go on asynchronously are transparent to the application. The next context definition event received with the same context ID value starts a new context instance. The new context instance does not have visibility to any of the earlier complex data with the same context ID value.

Context management – Termination by incoming event

- Context termination by incoming event
 - Can be set when adding a new event to context definition or
 - When editing an existing event in the context definition list
 - Select yes for the option “Terminate this context after this event”
 - Helpful when you want to clear all the state information of an completed event

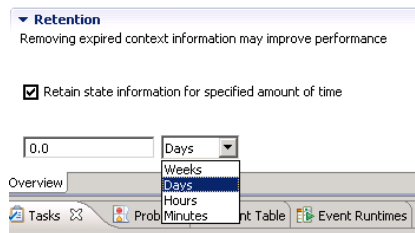


The screenshot shows a window titled "Edit Event" with a subtitle "Edit Event" and a description "Choose context ID and termination settings for the selected event". The "Event Name" is "new event". The "Context ID" is a dropdown menu showing "the ID of the customerVisit". Below this, the option "Terminate this context after this event?" is highlighted with a red box. It has two radio buttons: "yes" (which is selected) and "no".

You can also terminate the context upon the arrival and processing of an event. You can set the option “Terminate this context after this event” to yes on the events in the context definition. Context ends when the event is complete and the event runtime finishes processing the event and sending any actions related to the event. Shown here is a screen capture of edit event panel where the option is available.

Context management – Context retention period

- Retain state information for specified amount of time
 - Option to retain data by weeks, days, hours and minutes
 - Context information older than the retention period is deleted unless a rule expression specifies a time
 - Can be specified in conjunction with termination conditions
 - Context termination conditions have precedence over retention conditions
 - Context specific business object (CSBO) data is not deleted when retention conditions are met, only state information regarding events/actions

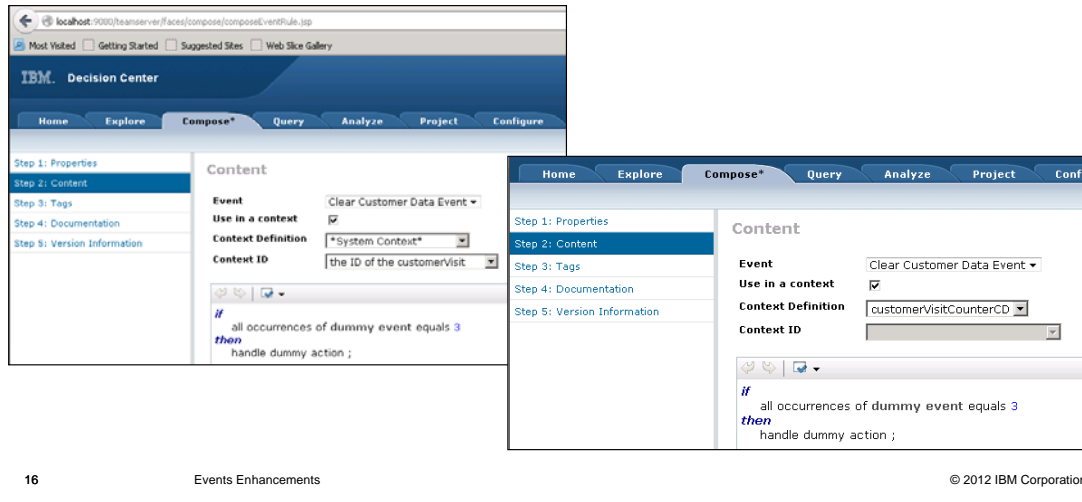


Apart from the context termination, you also have the option to configure the period for which you want to save the context data. With the context retention, the context instance is not terminated but only the data for the period of time specified is stored. You can set the time period for which you want to store the context instance data. By default, the retention option is not selected. So the context state information is deleted when the context ends, or when the state is no longer relevant, for example if the time specified in the rule expression has expired. If you are not interested in all the data related to the context from the start, you can configure the minutes, hours, days or weeks for which you want to retain the data. This will help improve the performance as the amount of data stored in the database is reduced.

Retention conditions can be specified in conjunction with termination conditions. When both are configured, termination takes precedence over retention.

Context definition in decision center enterprise console

- Context definition interface added to Decision Center enterprise console
 - Context definitions in the event project available to use or accessible
 - When creating new event rules
 - Editing existing rules
 - Viewing existing rules
 - Cannot be created in the enterprise console



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Events Enhancements

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Context definitions cannot be created in the decision center enterprise console. But any context definitions that are already defined in event designer and synced to decision center are accessible in the decision center enterprise console. You can associate the context definition with a new event rule or an existing rule in the enterprise console.

Events – Context interface added to decision center

The screenshot displays the IBM Decision Center interface for configuring an event rule. The breadcrumb path is "Explore > Details". The main title is "Create Customer Visit History (Event Rule)". A toolbar includes options for New, Edit, Delete, Copy, Lock, Unlock, Release lock, History, and Help.

Properties		Content	
Name	Create Customer Visit History	Event	Customer Visit Counter Event
Status	New	Context Definition	customerVisitCounterCD
Expiration Date	None	Context ID	(in context definition)
Effective Date	None		
Folder	/		
Group			
Created By	admin		
Last Changed By	admin		
Last Changed On	Oct 17, 2012 9:06:53 PM CDT		
Created On	Oct 17, 2012 9:06:53 PM CDT		
Type	Event Rule		

The "Content" section shows the following logic:

```

if
  all occurrences of customer visit counter event is at least 2
then
  handle customer visit action ;
  
```

Below the logic, there are sections for "Attached Items", "Tags" (No tag found), and "System Properties" (No system property found).

Shown here is a screen capture of a new event rule that was created in enterprise console and is associated with an existing context definition.

Event flow migration to context definition

- Migration from Event Flow.
 - Upward compatibility for Event Flows is maintained
 - Import the project containing event flow into event designer for V8.0.1
 - Event flow is upgraded to a context
 - Events in this context definition do not include associated context IDs.
 - context IDs are specified in the rules or rule groups
- Event Flow tool is not available IBM Operational Decision Manager V8.0.1

When you import a project with an event flow into event designer V8.0.1, event flow is automatically converted into a context definition. The events in the flow are added to the context definition but the context IDs for the events are not configured in the context definition. Instead, the context IDs are specified in the rules or rule groups in the imported event project.

Event flow tool is not available for installation in IBM Operational Decision Manager V8.0.1.

Events – Business object enrichment enhancement

Business object enrichment enhancement

- Motivation
 - Previous behavior – using a stored procedure, only one business object attribute can be manipulated at a time using “Enriched by expression option”
- Areas of enhancement:
 - Added a new enrichment type called Mapped Query
 - Enables you to enrich more than one business object attribute using stored procedures (or select statement)
 - If multiple rows are returned - array of business objects are created
 - Data mappings UI enhanced

The screenshot shows the configuration page for a field named 'firstName'. The 'General' tab is active, showing the field name as 'firstName' and its type as 'String'. There is a checkbox for 'Record this data in history' which is currently unchecked. The 'Documentation' tab is also visible, showing a navigation path and a template: 'the first name of a rajeshTestingBO' and '[first name] of (this)'. Below the 'Definition' section, there is a list of enrichment types: 'Undefined', 'Enriched by mapped key', 'Enriched by mapped condition', 'Enriched by mapped query', 'Enriched by expression', and 'Enriched by business rules'. The 'Enriched by mapped query' option is highlighted with a red box.

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In versions before IBM Operational Decision Manager(ODM) V8.01, when using a stored procedure only one field of business object can be manipulated at a time using “Enriched by expression option.” Even though a stored procedure can return a result set, the restriction in ODM allowed you to only populate one field in the business object. In V8.0.1 a new enrichment option called mapped query is added which allows you to enrich more than one business object attribute using stored procedures or select statement. If multiple rows are returned, an array of business objects is created.

Events – Business object enrichment enhancement

- Data mappings UI enhanced
 - Option to create a mapping group
 - Easier to identify the list of all attributes that get mapped by the enrichment type
 - In V8.0

Mappings

▼ Database mappings

If you plan to construct fields in this business object with the data from a data connection, select the data connection and the tables that map the fields in the business object to the columns in the data connection. You can map the fields to additional tables in the same data connection by selecting another table.

Field	Data Connection	Table	Column	Role of the field	
queryField	DB2_TESTDB	MAPPEDQUERY	COLUMN1	Key(column = field)	...
queryField2	DB2_TESTDB	MAPPEDQUERY	COLUMN2	Enriched (by mapped key)	...
queryField3	DB2_TESTDB	MAPPEDQUERY	COLUMN1	Enriched (by mapped key)	...

– In V8.0.1

Mappings

▼ Database Mappings

Definitions used to map the fields of the business object to data from database connection.

Field	Mapping	Group	Expression	
firstName	MAPPEDQUERY.COLUMN1	1	Column EQUAL to field	
lastName	MAPPEDQUERY.COLUMN2	1	Enriched by mapped key	
city	MAPPEDQUERY.COLUMN2	2	Column EQUAL to field	
temp	MAPPEDQUERY.COLUMN1	2	Enriched by mapped key	

New Mapping Group

Add to Mapping Group

Edit Mapping

Edit Group Expression

Change Enrichment Type

Remove Mapping

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Events Enhancements

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The data mappings user interface in event designer has been enhanced as part of adding the new mapped query enrichment type. You can now create a mapping group which can be used to group the list of attributes that are populated by an enrichment type. Shown here is the data mappings table from V8.0 and the new table from V8.0.1.

Events – Business object enrichment enhancement

- Create a mapping group

Mappings
 Definitions used to map the fields of the business object to data from database connection.

Field	Mapping
firstName	
lastName	MAPPEDQUERY.COLUMN
city	MAPPEDQUERY.COLUMN
temp	

New Mapping Group

Define the new mapping group and the mapping for the selected field.

Business object field: firstName

Enrichment type:

Data connection:

Table:

Column:

Field mapping:

New Mapping Group

Define the new mapping group and the mapping for the selected field.

Business object field: firstName

Enrichment type:

Data connection:

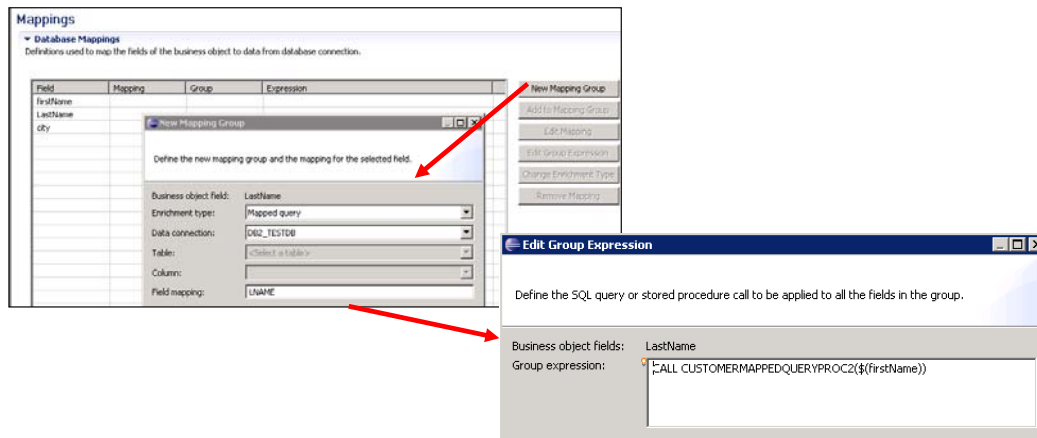
Table:

Field mapping:

Shown here are the steps involved in creating a new mapping group and selection of the enrichment type. Default option is no enrichment, but you can choose the options of mapped key, mapped condition or mapped query.

Events – Business object enrichment enhancement

- Configure mapped query
 - SQL query should return a single result set
 - Result set can contain multiple rows(columns)
 - Use add to mapping group to add additional business object attributes to the mapped query configuration



To configure the mapped query enrichment type, select the attribute of the business object and create a new mapping group, select the enrichment type as mapped query. You can choose the data connection you want associated with this enrichment type. The table name and column fields are disabled for mapped query. You need to provide the name of the field in the returned result set that you want mapped to the selected business object attribute. In the next panel, you can provide the group expression which returns the result set. You can either call a stored procedure or specify a select statement. You can add the other attributes in the business object to the same mapping group by selecting the “Add to Mapping Group” option. This option allows you to choose the mapping group number and provide the field name from the result set that you want to map the selected attribute to.

Summary

- JDBC action connector enhancements
 - Support for batching of multiple actions in an event rule
- Event widgets repackaging
 - Remove dependency on business space
 - DOJO components
- Context management
 - Termination of context
 - Retention of context data
 - Selectively save context data instead of saving all events and actions information
 - Ability to use the context definitions in enterprise console
- Business object enrichment enhancements
 - Mapped query

In the is presentation you were introduced to the enhancements added in version 8.0.1 of IBM Operational Decision Manager for event runtime and event designer. In this presentation you learned about the details on batching of multiple actions in JDBC, a new way of accessing the event widgets, ways to manage the context and the new mapped query enrichment type for business object fields are covered in this presentation

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