IBM

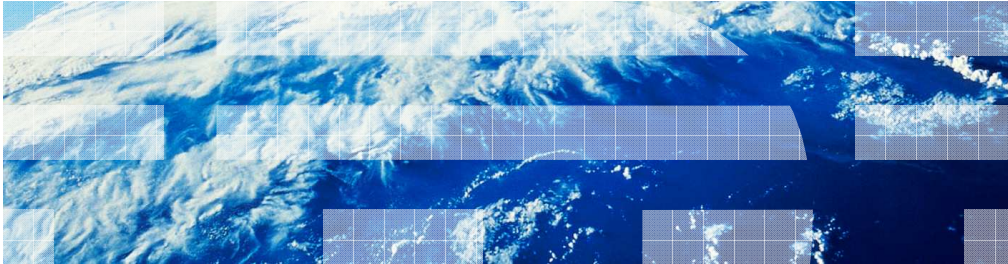# IBM Business Process Manager V7.5

IBM WebSphere technology adapters V7.5

This presentation provides a general overview of the IBM WebSphere Adapters V7.5

Goals and agenda

- Agenda
  - Technology adapters
    - Flat Files and FTP
    - ECM
    - JDBC
    - IBM i
    - Domino
  - Summary

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This presentation covers new features and enhancements in WebSphere technology adapters V7.5. They include Flat Files, FTP, ECM, JDBC, IBM i, and Domino adapter. The Email adapter is not covered here as there is no V7.5 enhancement.

Section

Flat Files and FTP adapters

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This section provides new features and enhancements specifically for both Flat Files and FTP adapters V7.5

Flat File and FTP adapters - support for using prefix and suffix strings for creating unique file names

- During outbound processing
  - Create unique files with a random number appended to the file name
  - Allow to specify the prefix and suffix (file extension) for the file name through the external service wizard
  - Enables you to generate unique files with meaningful names
  - Need to check the 'Generate a unique file' option

☑ Generate a unique file
To create unique files with a pre-defined prefix, specify the value of the prefix.

Prefix for the unique file: [   ]

To create unique files with a pre-defined suffix or extension, specify the value of the suffix.

Suffix (extension) for the unique file: [   ]

Example : Specify a prefix as **abcd** and a suffix of **.xyz** results as **abcd23423.xyz**, where **23423** is the randomly generated number by the adapter

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During outbound, the adapter can create files with unique file names. If GenerateUniqueFile property is specified as *True* in the wrapper business object, the adapter generates a unique file name which is in the form of a random number and ignores the value specified in the Filename property. While generating unique file names a prefix and suffix to the file name, a suffix can be in the form of an extension to the file. These properties can be configured using external service wizard.

As an example, if a prefix is specified as abcd and a suffix is specified as .xyz with option of generate unique file, the adapter creates the file whose name is similar to abcd23423.xyz where 23423 is a random number generated by the adapter.

Flat Files adapter – additional enhancements (1 of 2)

- Support for archiving the failed events with SplitBySize option
  - When an event file has failed business objects and file splitting by size is enabled, the event file is archived with the .fail extension in the specified archive directory
- Total business count no longer included in chunk information during inbound processing
  - Option to enable *includeBOCountInChunkInfo* property
  - Format of the chunk information when enable includeBOCountInChunkInfo
    - AbsolutePathOfEventFileNameInLocalEventDirectory_/_YYYY_MM_DD_HH_mm_ss_SSS_/_currentBONumberofTotalBOCount
    - For example: C:\flatfile\eventdir\c5.txt_/_2010_11_17_14_35_34_509_/_4of5

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There are additional enhancements included in Flat Files adapter V7.5. First, it supports for archiving failed events with splitbySize option. When SplitBySize property is enabled, the event file is archived with the .fail extension in the specified archive directory. Second, it is now an option to include the total business object count in the chunk information by using the includeBOCountInChunkInfo property. When the includeBOCountInChunkInfo property is enabled, the total business object count is included in the chunk information being sent to the endpoint. The format of chunk information should include the path of event file name in local event directory followed by time and current business objects number of total business object counts.

Flat Files adapter – additional enhancements (2 of 2)

- Support to handle large files
    - Previously, inbound processed a file by reading the entire content of the file at one go
        - Generated events for this file at one shot which causes out-of-memory
    - While processing large files the time taken to deliver events to the endpoint is enormously large compared to the time taken by subsequent polling cycles.
    - Business Impact
        - Eliminates any file size limitations for processing.
        - Achieves consistent performance even when dealing with a large file.
        - Delivers events to the endpoint as quick as possible, as required by the poll quantity. The time taken by the first polling cycle is consistent with the subsequent polling cycles
        - Reduces the memory footprint used considerably

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Continuing from previous slide, the Flat Files adapter V7.5 can now handle large files without any issues. Before V7.5, the adapter processed a file by reading the entire content of the file at one go and generated events at one shot which can cause to run out of memory easily. This enhancement can eliminate any file size limitations for processing and can achieve consistent performance when dealing with large files. It delivers events to the endpoint quickly as required by the poll quantity.

FTP adapter - additional SFTP commands support ExecuteFTPScript operation

- During outbound using ExecuteFTPScript operation, you can have commands contained in the script file to be processed on the SFTP server.

- Support for executing these commands
  - chmod – Allows to change the file and directory permissions
  - chown – Allows to change the owner of the file
  - chgrp – Allows to change the group associated with the file

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Using the ExecuteFTPScript operation in outbound processing, you can run the script files containing FTP and SFTP commands on the remote server. The script can contain commands to perform various tasks except creation or closing of connections to the FTP server.

With V7.5 of the adapter, additional commands are supported for the SFTP protocol. You can now run chmod, chown and chgrp commands on the SFTP server to change the permissions and ownership properties of files and directory.

FTP adapter - Support to configure verification of access permissions as optional

- Verifying access permission for output/remote directory
  - Previously, the adapter made a mandatory check for permission of the target directory (on a remote machine) on which the operation needs to be performed.
    - To achieve this, the adapter needs to perform a listing on the parent directory.
  - In a scenario where the FTP server is highly secured and user is locked in the home directory, a check for permissions on the parent directory is not allowed and exception is thrown
  - Business impact
    - Choose to configure the adapter to ignore the mandatory check for permissions on parent directory
    - Uncheck "Verify remote directory access permission" property

Connection properties
FTP system connection information

Host name: * [   ]

If the Remote directory is set to <HOME_DIR>, the adapter will poll for event files in the user's home directory

Remote directory:* [<HOME_DIR>   ]

[✓] Verify remote directory access permission

Local directory: * [   ] [Browse...]

Protocol: [FTP (File Transfer Protocol)   ▼]

Port number: [21   ]

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Previously, FTP adapter checked the read and write permissions of the remote directory before performing the outbound or Inbound operations. The listing permissions on the parent directory is required to check for the permission. Some of the FTP servers have security settings which locks you in their home directory and restricts them to move beyond the user's directory structure. In such a configuration, FTP adapter creates an exception if it is configured to work on your home directory since the check of permission is successful.

With V7.5, FTP adapter now provides an option to disable the verification of the permission on the directory while working with FTP server with such configuration. Ensure to uncheck "Verify remote directory access permission" property to disable the option.

Section

ECM adapter

This section provides new features and enhancements specifically for ECM adapter V7.5

ECM adapter - seamless inbound integration

- Previously, users manually
  - Deployed the Event Handler on the FileNet server
  - Configured the Event Action object with details of the Event Handler
  - Created event subscriptions on the FileNet server
  - Updated these subscription details in the adapter configuration
- With current release, all these operations have been automated
  - Enter the subscription name and event type during startup
  - Perform all of these operations for the client during startup

Select either from an existing Subscription or create a new subscription
- Create a new subscription
  Subscription Name: * Sub1
  Subscribed events:*
  Creation Event   Add...
                                                                          Remove

Before seamless inbound integration, you had to manually create subscriptions, deploy the event handler file, which is shipped along with the adapter on the FileNet Content Engine. Then create a corresponding Event Action using the Content Engine Create an Event Action Wizard, create a folder called ECMAdapterEvents at the root level, which is used to hold all generated events and finally gather the subscription details required to complete the external service wizard discovery. But with seamless inbound integration, all these operations have been automated by the adapter. Instead of entering the subscription ID during Inbound processing configuration, you are asked to enter the subscription name and the event type that you want to be notified of for the selected object type. After completion of Inbound processing configuration using the external service wizard, once the adapter is deployed on a runtime such as WebSphere Process Server and started, the adapter creates the requisite subscription for the configured object type on the FileNet Content Engine, deploys the event handler file, configures the Event Action with details of the Event Handler file and creates the ECMAdapterEvents folder at the root level and starts polling for events.

ECM - iterative development

- Regenerate and reconfigure artifacts previously generated during Outbound and Inbound
- Add and remove discovered objects using edit binding option
- Update operations in the service interface
- Helps user update the artifacts post generation to reflect changes in the EIS
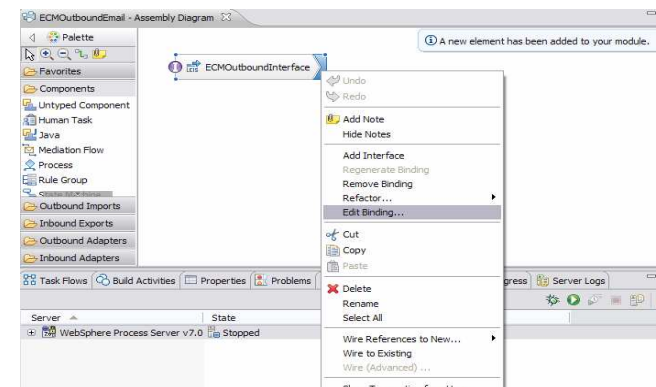
Iterative Development support for Inbound and Outbound facilitates the regeneration and reconfiguration of artifacts (import and export) that were previously generated during Outbound and Inbound discovery process. Once a service interface has been created, you can add and remove business objects and make changes to the operations in the service interface using the edit binding option as shown in the screen capture. Iterative development facilitates you to make changes to the generated artifacts post discovery so as to reflect any changes in the target EIS.

ECM adapter - support for folder type (1 of 2)

- Support for folder type has also been included in addition to document type
- Folder type can be used for case management
- The following operations can be performed on the folder

Outbound Operation	Description
Create	Allows user to create a folder on the content management system with the properties chosen during discovery
Update	Allows user to update a folder's content and properties on the content management system
Delete	Allows user to delete a folder on the content management system by specifying the object ID or by object path
Retrieve	Allows user to retrieve the properties and content in the form of stream for a specified document
RetrieveAll	Allow user to retrieve the folders that match a specified search criteria

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In addition to the already available Document Type, the ECM adapter V7.5 introduces the support for Folder Type. The addition of the Folder Type makes the ECM adapter an important component in the case management story. The adapter uses operations to perform actions such as creating instances of Folder types on the Content Management Repository. The name of the operation typically indicates the type of action that the adapter takes, such as Create, Update, Delete, Retrieve, or RetrieveAll.

ECM adapter- support for folder type (2 of 2)

An example of request and response business objects structures using Create operation is shown here. The adapter receives a request in the form of a business object to a create instance of a Folder type in the CMIS Repository. The adapter processes the request and a Folder with a unique immutable Object Identity (ID) is created in the Content Management Repository.

With request business objects, every Folder Type has a set of named, but not explicitly ordered, Properties that are added in a separate Business Object. The name of this Business Object is the Folder Type followed by the word Properties. After the Folder is created, the Properties Business Object is sent back to the calling component as a response to indicate that the document was created successfully.

After a successful create operation, the Response business object is returned to the calling component. Values for properties such as CmisU58objectId and CmisU58Path are generated and entered in the Response business object indicating a successful create operation.

Section

JDBC adapter

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This section provides new features and enhancements specifically for JDBC adapter V7.5

JDBC adapter - support for XML data type

- Extend its support for XML data type in stored procedure, query, and batch query business objects
- The XML data type is used to define columns of a table that store XML values.

Databases now support new data types like XML data type as an additional type along with default data types like numeric, character, binary and so on. The XML data type is used to define columns of a table that store XML values. Before JDBC adapter V7.5, there was no support for XML data type. But with JDBC adapter V7.5, the adapter now provides the support for XML data type in stored procedure, query, and batch query business objects.

JDBC adapter - support for retrieve records page wise using "enablePaging" property

- Paging is a feature provided to select a range of records from the data base instead of selecting the entire set of records from the table

- During EMD, the "enablePaging" property is used to enable or disable this feature

- While using this property, it sets the properties **Starting index to return records** and **Number of records per page**
  - **Starting index to return records (startIndex)** - indicate the starting index to return records for the RetrieveAll operation
  - **Number of records per page** – indicates the number of records to be retuned from the starting index for the RetrieveAll operation

☐ Return all records for RetrieveAll operation

Maximum records for RetrieveAll operation:* `100`

☑ Allow paging of records for the RetrieveAll operation

Starting index to return the records: * `0`

Business object namespace: `http://www.ibm.com/xmlns/prod/websphere/j2ca/jc`

For better performance, in most cases you just want to handle a page of records in one operation. Similarly due to limitations on lower memory and bandwidth requirement, you need to read specific number of records. JDBC adapter V7.5 provides solution with the new enhancement of retrieving records in groups with limited size. Paging is a feature provided to select a range of records from the data base instead of selecting the entire set of records from the table. During Metadata discovery set the property "enable paging" to enable this feature. If property is set to True, the adapter to returns records from the starting index that you specified. If the number of records retrieved from database exceeds the maximum records value that you specified, only the records in the specified range are returned and no exception is generated. During adapter run time these properties can be dynamically changed in the mediation/BPEL

JDBC adapter - support for new outbound operations (1 of 6)

- DeleteAll
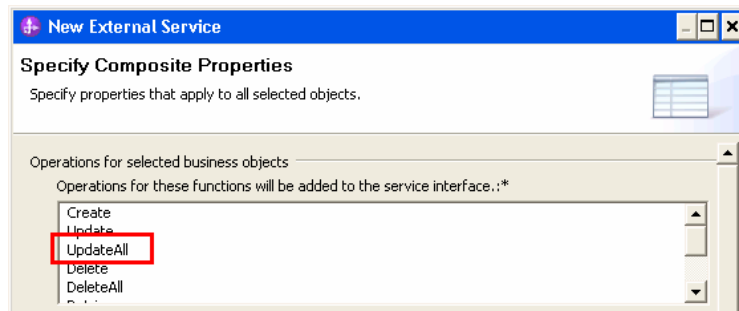 - In EMD select the operation DeleteAll
  - Adapter returns the number of records deleted after execution
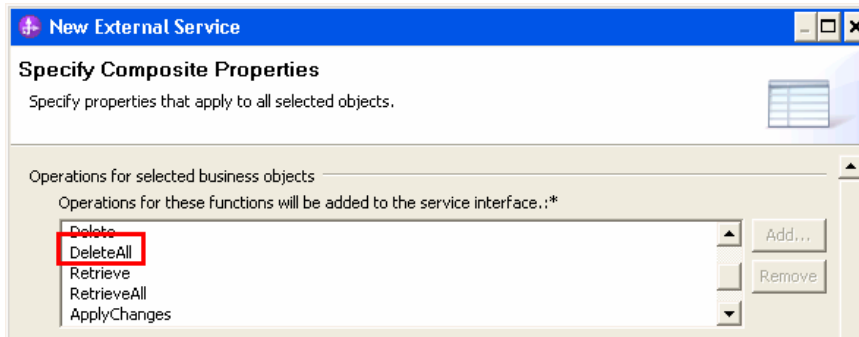
Previously, basic operations like Create, Update, Retrieve and Delete were supported. With V7.5, JDBC adapter extends its support for multiple other operations in order to improve the performance of business process. During metadata discovery, select the operation DeleteAll to get the extended support for this feature. At run time adapter runs the delete statement based on the condition based on the input and delete all matching records. Adapter retrieves the number of records that have been deleted, and returns it through BulkOperationResult BO. If any record failed to be deleted, the operation failed, and no record is deleted.

JDBC adapter - support for new outbound operations (2 of 6)

- UpdateAll
  - In EMD select the operation UpdateAll

  - Adapter returns the number of records updated after execution

During metadata discovery select the operation UpdateAll to get the extended support for this feature. At run time the adapter runs the update statement based on the condition based on the input and update all matching records. The adapter retrieves the number of records that have been updated, and returns it through BulkOperationResult BO. If any record failed to be updated, the operation failed, and no record is updated.

JDBC adapter - support for new outbound operations (3 of 6)

- Batch Create
- Batch Update
- Batch Delete
  - In EMD select the required operation

Operations for selected business objects
Operations for these functions will be added to the service interface.:*

Exists
Upsert
BatchCreate
BatchUpdate
BatchDelete

Additional Business Faults

Pattern for the Additional

Pattern String

The new operations for Batch support.

The bus

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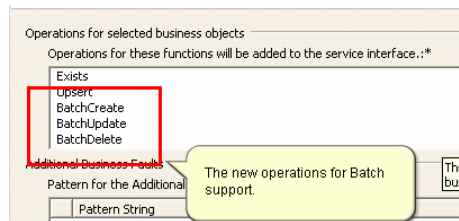
Before JDBC adapter V7.5, in order to run multiple SQL statements of same nature (create/update/delete) at a time was not provided. In JDBC adapter V7.5 new enhancement is provided using which multiple create/update/delete statements can be run at a time. This enhancement provides significant improvement in the adapter performance. During metadata discovery for Outbound select the required Batch operation (BatchCreate/BatchUpdate/BatchDelete).

JDBC adapter - support for new outbound operations (4 of 6)

- The result of BatchCreate operation execution in Integration Designer's test module

A simple **BatchCreate** operation result is given here for reference.

– In Specify Composite Properties page, choose the option based on the requirement

Specify how the adapter returns records for the RetrieveAll operation

○ Return all records

Return all records matching the query.

● Return specified number of records

Maximum number of records to be returned:∗ `100`

○ Return specified number of records per page from the starting index

Starting index to return records: `0`

Number of records per page: `100`

☐ Return exception when no records are affected during UpdateAll, DeleteAll or Batch operation

Business object namespace: ...here/

Specify the relative folder for gen...

By default, the Batch operations does not generate exception when no records are affected during the outbound process, if you want you can change this options to allow adapter generate exception.

Folder: ...

☑ Generate a business graph for ...

? | < Back | Next > | Finish | Cancel

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Selecting the option "**Return exception when no records are affected during UpdateAll, DeleteAll, or BatchOperation**", enables adapter to through an exception incase a failure happens during the execution of the SQL.

JDBC adapter - support for new outbound operations (6 of 6)

- Example of input business object:
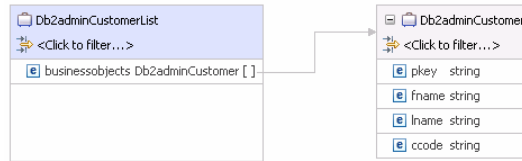
- Example of output business object:
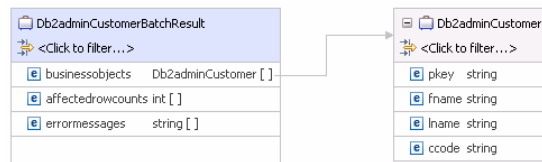
The Batch operation takes **ListBO** as input and provides **BatchResultBO** as output. A sample is given in here.

Section

IBM i adapter

IBM WebSphere technology adapters V7.5

This section provides new features and enhancements specifically for IBM i adapter V7.5

IBM i adapter - support for globalization with the use of CCSID in a callPGM operation

- CCSID - Coded Character Set Identifier

- Support encoding the characters in the input and output parameters it executes the RPG/COBOL/Service programs (callPGM operation)

- CCSID can be provided in both :
  - External Service Wizard
  - PCML

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CCSID (Coded Character Set Identifier) is a 16-bit number that represents the encoding of a specific code page. Enabling CCSID for the WebSphere adapter for IBM i provides you the freedom to use multiple language content, processed by adapter. With this new enhancement, the adapter can take the CCSID value, either in the External Service Wizard or in the PCML. Note that CCSID support is provided for callPGM operation (RPG, COBOL and Service Programs) only.

IBM i adapter - providing the CCSID in External Service Wizard

- Two types of CCSID values can be provided in the External Service Wizard.
  – Connection CCSID
  – Data CCSID

Connection CCSID - CCSID on connection to the IBM i system

Data CCSID - Character encoding for the parameters

Characters Type - Specify Single Byte or Double Byte Character

Users can provide the CCSID values in the Advanced Tab of the "Specify the Service Generation and Deployment Properties" window.

The Adapter supports these two types of CCSID values. They are connection CCSID and data CCSID. The Connection CCSID is used to set the CCSID on the connection to the IBM i system. And the data CCSID is used to encode the input and output of the parameters.

IBM i adapter - providing the CCSID in the PCML

- The CCSID can be provided in the data tag of the PCML

- **ccsid =** Specifies the CCSID for character data for the **<data>** element.

- **chartype =** Specifies the size of each character
  - *For example, single byte* or *double byte*

```
<pcml version="4.0">
  <!-- COBOL program: SAMPLE8 -->
  <!-- created: 10/09/09 11:52:23 -->
  <program name="SAMPLE8" path="/QSYS.LIB/SAMPLE8.PGM">
    <data name="DATA1" type="char" length="5" chartype="twobyte"
      ccsid="1399" usage="inputoutput" />
  </program>
</pcml>
```

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Users can also provide the CCSID and Character type values in the data tag of the PCML. Char type is used to specify the type of Character Set, that is Single Byte Character Set (one byte) or Double Byte Character Set. If a char type is not present in the data tag of the PCML, the adapter then considers the default value which is single byte.

If CCSID is present in both PCML and external service wizard, the wizard CCSID takes a highest priority for both single byte and double byte character values. If no CCSID value is provided in external service wizard , then the CCSID inside the PCML is considered as the default coded character set identifier.

IBM i adapter - discovery of PCMLs in the Local File System

- Users can now have the PCMLs in their local file system

- Active connection to the IBM i machine is not required in the discovery phase

Select the discovery mode as Local Discovery

Specify the path to the directory in the local file system where the PCMLs are present

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Before IBM i adapter V7.5, the adapter discovered the PCMLs present only in the IBM i system. This mandated the users to store the PCMLs in the IFS file directory and required an active connection to the IBM i system, during the discovery phase. With V7.5, the adapter supports discovery of PCMLs present in the local file system too. Now, you do not need to have active connection to the IBM i system during the discovery phase. So with this enhancement, you can also use handwritten PCMLs for discovery.

You can enter the discovery mode and relevant fields in "Specify the Discovery Properties" window.

IBM i adapter - option to select different passByType value for service programs

- Choose the Pass By Type value in the External Service Wizard

- Possible values are
  - Pass By Value
  - Pass By Reference

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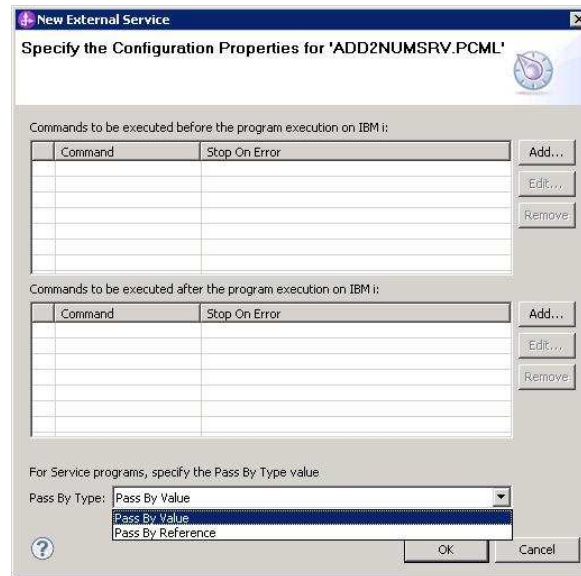
To run the Service programs, you need to pass a few arguments for each service program, based on its definition. These arguments can be passed either pass by value or pass by reference.

Before IBM i adapter V7.5, the adapter assigned by default, the "Pass By Value" to the Pass By Type filed. With V7.5, you can choose either "Pass By Value" or "Pass By Reference" to the Pass By Type filed in the "Specify the Configuration Properties" window.

Lotus Domino adapter

IBM WebSphere technology adapters V7.5

This section provides new features and enhancements specifically for Domino adapter V7.5

Lotus Domino adapter - Form specific inbound event notification (1 of 2)

- Selectively notifying events on specific forms
  - Previously, all events for a configured database were recorded in the event table
  - Filter events of forms
  - Reduce overhead in event processing

- Business Impact
  - Create new configuration documents in the 'EventTriggerConfigurationView' to use this new feature
    - The 'EventTriggerConfigurationView' of the Inbound Extension Manager
    - If not empty, it overrides the 'ConfigurationView' which was previously used by users

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This new feature can be used in scenarios where the Lotus Domino adapter wants to be notified of events on specific forms only. The inbound extension manager of WebSphere Adapter for Lotus Domino listens to events only from the specific forms configured by you and records those events in the event table.

Lotus Domino adapter - Form specific inbound event notification (2 of 2)

▪ How does it work?

Event Trigger Configuration View in Extension Manager

New EventTriggerConfiguration Edit Document		
Connector ID	**Monitored Documents**	**Event Types**
WALD1	SampleDatabase.nsf:EmployeeWithRichText	Create;Update;Delete
WALD1	SampleDatabase.nsf:Employee	Create;Update;Delete

Event Table View when a 'Create' event occurs on SampleDatabase.nsf:Employee

EventID	Connector ID	Universal ID	EventType	Form
67001	WALD1	67899078	Create	SampleDatabase.nsf:Employee

Domino Adapter 1

Event Table View when a 'Create' event occurs on SampleDatabase.nsf:EmployeeWithRichText

67003	WALD1	78563489	Create	SampleDatabase.nsf:EmployeeWithRichText

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This example shows polling of the events on Employee and EmployeeWithRichText forms of the SampleDatabaseEmployee.nsf database. You need to configure the two event trigger configuration documents; SampleDatabase.nsf:Employee and SampleDatabase.nsf:EmployeeWithRichText in the 'Monitored documents' field. When there is a Create event on the form Employee, one entry is created in the Event table as shown in the slide. The adapter configured with the 'WALD1' Connector ID in the Activation Specification property 'Adapter Instance for Event Filtering' picks up this event. It works similarly for events on the EmployeewithRichText form.

Lotus Domino adapter - Multiple configurations support in Inbound Event Manager (1 of 2)

- Allows different adapters to poll specific events
  - Previously, all adapters where polling all the events in the event table.
  - Reduce overhead in event processing

- Business Impact
  - Create new configuration documents in the 'EventTriggerConfigurationView' to use this new feature
    - The 'EventTriggerConfigurationView' of the Inbound Extension Manager
    - If not empty, it overrides the 'ConfigurationView' which was previously used by users

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In scenarios where multiple Lotus Domino adapters are polling the same Event table, this feature can be used to identify the specific events to be polled by each adapter.

You can create multiple configuration documents in the Event Trigger Configuration view of the WALD Inbound Event table. Each configuration document is marked by the Connector ID and is used to specify the type of event which is logged in the event table for this Connector ID. The adapter allows creation of more than one configuration document with the same or different Connector IDs. You can specify the Connector ID in the Activation Specification property 'Adapter Instance for Event Filtering'. This enables the adapter to poll only the events recorded with the specified Connector ID.

Lotus Domino adapter - Multiple configurations support in Inbound Event Manager (2 of 2)

In this example, when there is a Create event on the form Employee in SampleDatabase.nsf:Employee, two separate events are recorded in the event table. One event is recorded with WALD1 Connector ID and the other with WALD2 Connector ID. The adapter which has Activation Specification property 'Adapter Instance for Event Filtering' = 'WALD1' will poll only the events with Connector ID = 'WALD1' in the event table. It works similarly for events on EmployeeWithRichText form in the SampleDatabase.nsf database.

IBM

Summary

The next section provides the Summary of this adapter presentation.

Summary

- Summary
  - Provided list of specific enhancements in each adapter
    - Flat Files and FTP adapters
    - ECM adapter
    - JDBC adapter
    - IBM i adapter
    - Domino adapter
- References:
  - IBM WebSphere adapters V7.5 information center

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r5mx/index.jsp?topic=/com.ibm.wsadapters.jca.doc/welcome_wsa.html
  - WebSphere Adapters Support

http://www.947.ibm.com/support/entry/portal/Overview/Software/WebSphere/WebSphere_Adapters_Family

IBM WebSphere technology adapters V7.5

In summary, this presentation has covered details of the new enhancements for IBM WebSphere technology adapters in V7.5 release. You can also review the references here to find more details about adapters support and in the information center.

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