



IBM Software Group

# WebSphere® Business Process Management Suite V6.2

## *WebSphere Adapters V6.2 overview*



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This presentation provides a general overview of the IBM WebSphere Adapters V6.2

## Agenda

- IBM WebSphere Adapters V6.2 portfolio
- Common new features and enhancements
- Monitoring and logging
- Error handling
- Summary



This presentation starts with a recap of the current available adapters. It also reviews the enhancements and new features to the existing adapters. Then it goes through some of the enhancement configuration in monitoring and logging for all adapters. At the end, there is also additional enhancement to outbound error handling.

## Section

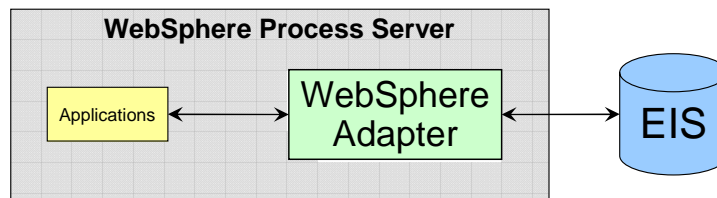
# ***WebSphere Adapters V6.2 portfolio***



This section recaps all of the available WebSphere Adapters in V6.2 and introduces new adapter.

## Overview – Available in V6.2

- IBM WebSphere Adapters
  - Technology
    - IBM WebSphere Adapter For Flat Files V6.2
    - IBM WebSphere Adapter for FTP V6.2
    - IBM WebSphere Adapter for JDBC V6.2
    - IBM WebSphere Adapter for E-Mail V6.2
    - **IBM WebSphere Adapter for IBM i V6.2**
  - Application
    - IBM WebSphere Adapter for SAP Applications V6.2
    - IBM WebSphere Adapter for PeopleSoft Enterprise V6.2
    - IBM WebSphere Adapter for Siebel Business Applications V6.2
    - IBM WebSphere Adapter for JD Edwards Enterprise One V6.2
    - IBM WebSphere Adapter for Oracle E-Business Suite V6.2
- Implement Java™ EE Connector Architecture (JCA 1.5)
- Integrated with WebSphere Process Server and WebSphere Enterprise Service Bus V6.2
- Use Adapter Foundation Classes that enhance JCA 1.5 and encapsulate many common adapter functions



Here is the list of adapters that are available for version 6.2. They include the Flat File, FTP, JDBC, and E-mail technology adapters along with the SAP, PeopleSoft, Siebel, JD Edwards, and Oracle E-Business application adapters. In addition, a new IBM WebSphere Adapter for IBM i V6.2 is introduced as part of technology adapters. To recap, these are all based on a set of foundation classes that enhance the JCA 1.5 specification. These foundation classes contain many new features for the 6.2 release.

## Section

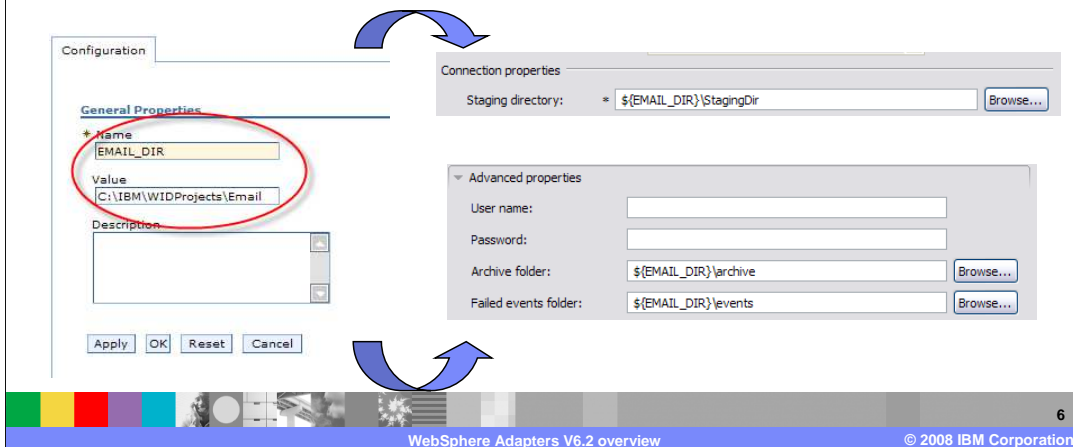
# ***New features and enhancements common for all adapters***



This section covers new features and enhancements for all WebSphere Adapters.

## WebSphere variables

- Local directory properties can be used with WebSphere environment variables
  - Email, Flat Files, and FTP adapters
  - Avoiding hard-coding
  - Providing WebSphere environment variables in WebSphere Process Server administrative console



Previously, Activation Specification and Managed Connection Factory properties values needed to be hard-coded. With this enhancement, adapter can avoid the hard-coding by using WebSphere environment variable. The user creates and provides the WebSphere environment variables from WebSphere Process Server administrative console. For example, user can declare the Activation Specification properties as '\${EMAIL\_DIR}/events' and '\${EMAIL\_DIR}/archive' and then define the EMAIL\_DIR variable with the directory name as the WebSphere environment variable. In that case, user can eliminate errors in manual works. All properties which require manual hard-coding can be filled with WebSphere environment variables.

## WebSphere variables

- Available for this version

WebSphere Adapters	WebSphere Variables
Flat Files	X
FTP	X
Email	X
JDBC	
Oracle EBS	
JD Edwards	
SAP	
Siebel	
PeopleSoft	
IBM i	

Here is the list of adapters that supports WebSphere variables enhancement for this version.

## Event filtering



- Support event filtering based on the connector ID
  - ▶ Enable load balance with large number of events of the same type
  - ▶ Provide filtering mechanism when a connector ID is configured
- Benefits
  - ▶ Minimal impact for user migrating from WebSphere Business Integration Adapters (WBIA) → JCA
  - ▶ Support earlier versions without connector ID field
  - ▶ Scripts to add connector ID field in event table structure



The purpose of this new feature is to enable seamless migration for WebSphere Business Integration Adapters (WBIA) to JCA where users are currently taking advantage of the connector ID filtering. It allows large users that are currently dependent on this in WBIA to more easily migrate. This is also benefit to users to load balance when they have large number of events of the same type.

WebSphere Adapters supports this filter through Activation Specification property and provides the filtering mechanism when a connector ID is configured. The adapter only retrieves events with that particular connector ID. The event table structure is also required to update with new connector ID field to use this new feature. However, it also ensures compatible with earlier versions when connector ID field is not specified. That allows the event table structure without the connector ID field to be supported. In addition, there is minimal impact for users who migrate from WBIA since the connector ID filtering has similar mechanism.



## Event filtering

- Adapter Instance
  - ▶ Configure in Activation Specification
  - ▶ String value for event filtering
  - ▶ Ignore if adapter instance for event filtering is not configured
- Event Store
  - ▶ Additional column for connector ID

Event delivery configuration

Type of delivery: ORDERED

Ensure assured-once event delivery (may reduce performance)

Do not process events that have a timestamp in the future

Event types to process:

**Adapter Instance for event filtering:**

Retry limit for failed events: 5

Number of connections for event delivery

Minimum: 1

Maximum: 1

As mentioned from previous slide, this event filtering is configured in Activation Specification with any string values and required changes to the event store to add another column for connector ID. The adapter then adds the corresponding column to the event query. However, this filtering can also be ignored when user does not want to use this new feature.

## Event filtering

- Available for this version

WebSphere Adapters	Event Filtering
Flat Files	
FTP	
Email	
JDBC	X
Oracle EBS	X
JD Edwards	
SAP	
Siebel	X
PeopleSoft	X
IBM i	X

Here is the list of adapters that supports event filtering for this version. Only adapters which have actual event table structures located in Enterprise Information System and databases support this filtering mechanism.

## Retry connection

- Adapters can retry connection to EIS when starting the application
  - ▶ New activation specification property, “validateConnectionStartup”
  - ▶ Boolean value
    - True – retry to connect to EIS
    - False (default) – not retry to connect to EIS

Event polling configuration

Interval between polling periods (milliseconds): 2000

Maximum events in polling period: 10

Retry interval if connection fails (milliseconds): 60000

Number of times to retry the system connection: 0

Stop the adapter when an error is encountered while polling

Retry EIS connection on startup

This common enhancement provides an opportunity for users to be able to retry connection to EIS when starting the application. Retry connection is depending on retry interval and retry number of times. It also based on Boolean property whether retry is going to occur or not. When the enterprise information system is down during adapter start up and the “Retry EIS connection on startup” property is set as true, the adapter will retry to connect the enterprise information system. When the enterprise information system is down during adapter startup and the “Retry EIS connection on startup” property is setting as false, the adapter does not retry to connect the enterprise information system.

## Retry connection

- Available for this release

WebSphere Adapters	Validate Connection on Startup
Flat Files	X
FTP	X
Email	x
JDBC	X
Oracle EBS	X
JD Edwards	X
SAP	
Siebel	X
PeopleSoft	X
IBM i	X

Here is the list of adapters that supports retry connection enhancement for this version. Notice SAP adapter does not support retry connection at this time.

## Section

# ***Monitoring and logging common for all WebSphere adapters***



This section covers common monitoring and logging for all WebSphere Adapters.

## Confidential tracing

- Enabling confidential tracing
  - ▶ Display X values to protect sensitive user data
  - ▶ Traced as confidential
    - The contents of a business object
    - The contents of the object key of the event record
    - User names
    - The URLs used to connect to the database

Class Loader Viewer > Target specific application status > JDBCTestApp > Managed Modules > CWYBC JDBC.rar > JDBCTestApp.IBM WebSphere Adapter for JDBC > Custom properties

Use this page to specify custom properties that your enterprise information system (EIS) requires for the resource providers and resource factories that you configure. For example, most database vendors require additional custom properties for data sources that access the database.

Preferences

Name	Value	Description	Required
QueryTimeout	001		false
adapterID	001		false
threadContextPropagationRequired	true		false
traceFileName			false
traceFileSize	0		false
logFileName			false
logNumberOfFiles	1		false
enableHSJSupport	true		false
traceNumberOfFiles	1		false
databaseVendor			false
StackTrace			false
hideConfidentialTrace	false		false
logFileSize	0		false
ReturnDummyResultSet			false
Total 14			

Build Activities | Properties | Problems Servers Console

**Import: JDBCOutboundInterface (EIS Binding)**

Connection Resource Adapter

Resource adapter name: JDBCTestApp.IBM WebSphere Adapter for JDBC

Resource adapter class name: BCResourceAdapter

Resource Adapter Bean Properties

Adapter ID: \* 001

Disguise user data as "XXX" in log and trace files.

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In the past, the trace files were not widely available to support representatives because trace files can contain data from databases, which might contain sensitive or confidential information. This information of a sensitive nature in adapter log or trace files can potentially violate a customer's privacy. This can also prevent you from sharing the log and trace file with support representative, hindering the troubleshooting process.

With this enhancement, WebSphere Adapter allows users to enable confidential tracing. The Confidential tracing feature allows users to prevent confidential information from displaying in the log and trace files by replacing the confidential data with Xs. In this scenario, if user enables this property then at run-time, adapter will display series of Xs in place of data instead of the actual data. Some confidential data include contents of business objects, contents of the object key of the event record, user names and passwords, and database URL used to connect to an Enterprise Information System or database.

User can enable this option during Enterprise Metadata Discovery by checking "Disguise user data as "XXX" in log and trace files" option under Logging and Tracing. For inbound processing, this property is part of the resource adapter properties. For outbound processing, it is part of the managed connection factory properties.

## Confidential tracing

- Confidential tracing from the log

Name	Value	Description	Required
XADatasourceName			false
DatabaseURL	jdbc:db2://localhost:50000/JDBCTEST		false

QueryTimeout		false
DataSourceJNDIName	jdbc/db2	false
UserName	db2admin	false
jdbcDriverClass	com.ibm.db2.icc.DB2Driver	false
traceFilename		false



```
JDBCRA693 2 com.ibm.j2ca.dbadapter.core.runtime.DBManagedConnection getWBIConnection
Entering method.
[7/11/08 13:36:24.968 CDT] 00000084 JDBCRA693 3
com.ibm.j2ca.dbadapter.core.runtime.DBManagedConnection getWBIConnection userName =
XXXXXXXXX
[7/11/08 13:36:24.968 CDT] 00000084 JDBCRA693 3
com.ibm.j2ca.dbadapter.core.runtime.DBManagedConnection getWBIConnection DataSource JNDI
Name = jdbc/Derby XA for JDBC
[7/11/08 13:36:24.968 CDT] 00000084 JDBCRA693 3
com.ibm.j2ca.dbadapter.core.runtime.DBManagedConnection getWBIConnection database URL =
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
[7/11/08 13:36:24.968 CDT] 00000084 JDBCRA693 3
com.ibm.j2ca.dbadapter.core.runtime.DBManagedConnection getWBIConnection Driver class
Name = org.apache.derby.jdbc.EmbeddedDriver
[7/11/08 13:36:24.968 CDT] 00000084 JDBCRA693 3
com.ibm.j2ca.dbadapter.core.runtime.DBManagedConnection getWBIConnection Getting the
DataSource object
[7/11/08 13:36:25.156 CDT] 00000084 InternalGener I DSRA8203I: Database product name :
Apache Derby
```

Above example is what user expects to see in the log and trace files when the confidential tracing option is enabled. Notice the username and databaseURL values are replaced with X values to hide sensitive user data.

## Confidential tracing

- Available for this version

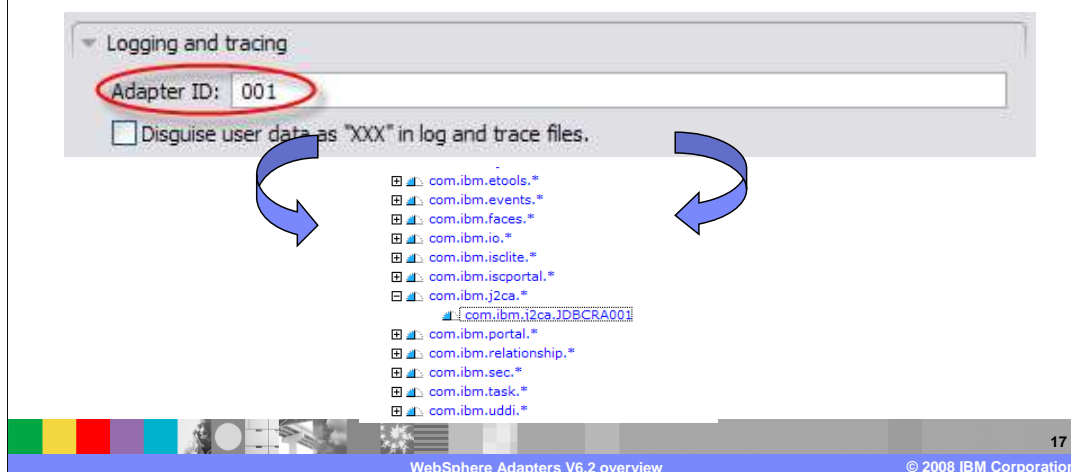
WebSphere Adapters	Enable Confidential Tracing
Flat Files	X
FTP	X
Email	X
JDBC	X
Oracle EBS	X
JD Edwards	X
SAP	
Siebel	X
PeopleSoft	X
IBM i	X

Here is the list of adapters that supports confidential tracing for this version. Notice SAP adapter does not support confidential tracing at this time.



## Log and trace filtering

- Enabling filtering and highlighting support
  - ▶ Identified the adapter instance in log and trace files
  - ▶ Used with an adapter-specific identifier, MyAdapterRA



Previously, IBM WebSphere Adapters do not utilize the Filtering and Highlighting features available in the Log and Trace Analyzer component. It was possible to identify all adapter messages, but user can not filter out a particular adapter type or instance. With this enhancement, user can now enable the adapter to use the Filtering and Highlighting capabilities of the Log and Trace Analyzer component. Filtering and Highlighting allows developers and administrators to focus their troubleshooting efforts because they can filter on a specific sub-component and highlight the messages that apply to that sub-component.

This property identifies the adapter instance in log and trace files and for PMI events. The adapter ID is used with an adapter-specific identifier, MyAdapterRA, to form the component name used by Log and Trace Analyzer. For example, if the adapter ID property is set to 001, the component ID is FFRA001 for Flat File adapter, FTPRA001 for FTP adapter, EMARA001 for E-mail Adapter, and so on. If multiple adapter instances are used, the adapter ID numbers is then different. For example, one adapter might have an ID of "001" and the other "002". The log file should expect to see adapter logs of "FFRA001" and "FFRA002". For inbound processing, this property is retrieved from the resource adapter properties. For outbound processing, it is retrieved from the managed connection factory properties.

## Log and trace filtering

- Available for this release

WebSphere Adapters	Log and Trace Filtering Support	Filter String
Flat Files	X	FFRAXXX
FTP	X	FTPXXXX
Email	X	EMARAXXX
JDBC	X	JDBCXXXX
Oracle EBS	X	OEBSRAXXX
JD Edwards	X	JDERAXXX
SAP	X	SAPRAXXX
Siebel	X	SEBLRAXXX
PeopleSoft	X	PSFTRAXXX
IBM i	X	ISERAXXX

Here is the list of adapters that supports utilizing filtering and highlighting capabilities of the log and trace analyzer component.

## Section

### ***Problem determination and error handling common for all WebSphere adapters***



This section covers common problem determination and error handling for all WebSphere Adapters.

## Problem determination: Log and trace files

- WebSphere Process Server
  - ▶ <WPS\_Home>\profiles\<profile>\logs\<server>\SystemOut.log
  - ▶ <WPS\_Home>\profiles\<profile>\logs\<server>\SystemErr.log
  - ▶ <WPS\_Home>\profiles\<profile>\logs\ffdc\xxxxxx.log
- Adapter Logs and Traces Files
  - ▶ Messages and Exceptions logged in these files
- Enterprise metadata discovery logs, specified during discovery
  - ▶ Default: <WID\_workspace>\.metadata\<Adapter>MetadataDiscovery.log
- WebSphere Integration Developer
  - ▶ <WID\_workspace>\.metadata\log



The location of the log and trace files is specified here. The WebSphere Process Server log files are the System out and System error log files in the profile logs directory of the server.

Then there are the adapter log and trace files. The trace file locations are specified using the log and trace file attributes on the adapter. In addition, the trace files location and trace strings are specified in the administrative console of the Process Server for the server's change log and trace file option.

While running the enterprise metadata or service discovery tools, the log file is within the WebSphere Integration Developer workspace in the directory specified.

The overall log file for WebSphere Integration Developer is in the workspace metadata log file.

## Problem determination: Logging

- User messages and language translated

Logging Level	Content
Fatal	Task cannot continue. Component cannot function.
Severe	Task cannot continue. Component can still function. This also includes conditions that indicate an impending unrecoverable error, that is, reporting on situations that strongly suggest that resources are on the verge of being depleted.
Warning	Potential error or impending error. This also includes conditions that indicate a progressive failure, that is, the potential leaking of resources.
Audit	Significant event affecting server state or resources
Info	General Information outlining overall task progress
Config	Configuration change or status

The different logging levels are specified on this page. These messages are translated and they appear in the WebSphere Process Server system out log files.

## Problem determination: Tracing

- Service level information for IBM Support
  - Not translated
  - Specified at the Adapter level through its custom properties

Tracing Level	Content
Fine	Trace info – general trace, plus method entry / exit / return values
Finer	Trace info – detailed trace
Finest	<ul style="list-style-type: none"><li>▪ Trace info – most detailed trace</li><li>▪ Includes all detail needed to debug problems</li></ul>

The trace strings are more geared towards IBM Support. The different tracing levels are specified on this page. These are specified at the Adapter through its custom properties.

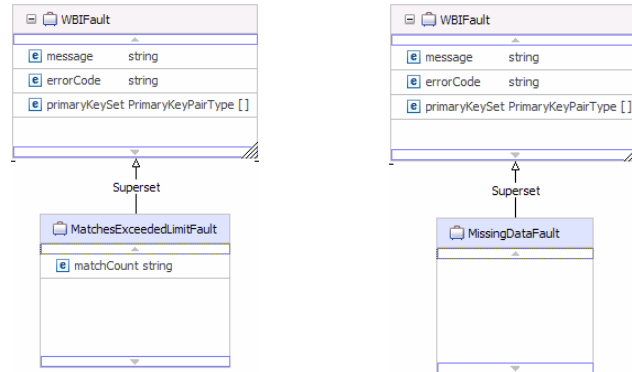
## Error handling

- Enhance to ensure appropriate and meaningful error messages are displayed.
- Outbound error handling
  - ▶ A fault business object which thrown exception condition
    - Business rule violation
    - Constraint violation
  - ▶ The adapter creates fault exceptions for business errors to distinguish from resource exceptions

While running the outbound operations, the adapter will create faults for any business errors encountered while processing the outbound request. This is applicable for WebSphere Process Server, WebSphere Enterprise Service Bus, and other runtimes that have SCA support. Business faults occur at predictable points in a business process as a result of a business rule violation or a constraint violation. Although WebSphere Process Server or WebSphere Enterprise Service Bus support other types of faults, the adapter generates only business faults, which are called *faults*. Not all exceptions become faults. Faults are generated for errors that are actionable, that is, errors that can have a recovery action that does not require the termination of the application. For example, the adapter generates a fault when it receives a business object for outbound processing that does not contain the required data or when the adapter encounters certain errors during outbound processing. `FaultException` extends `ResourceException` and allows adapters to differentiate a fault, or business exception, from a `ResourceException`.

## Fault business objects

- Superset business objects – WBIFault
- WBIFault contains all information to handle the Faults
  - ▶ Might contain matchCount attribute to provide additional information about the error



Continue from previous slide, the Enterprise Metadata Discovery creates a business object for each fault that the adapter can generate. In addition, the service creates a WBIFault superset business object, which has information common to all faults, such as the message, errorCode, and primarySetKey attributes as shown above. Some faults contain the matchCount attribute, to provide additional information about the error. For others, WBIFault contains all the information needed to handle the fault.



## Fault business objects

- Each adapter supports different kinds of Faults business objects
  - ▶ Common Faults business objects
    - IntegrityConstraintFault
    - MissingDataFault
    - RecordNotFoundFault
    - PrimaryKeyPairTypeFault
  - ▶ Operations support multiple faults business objects



Each adapter has different set of faults business objects. Some of the base fault exceptions are shown on this page. In addition, each fault business object is associated to certain operations only. For example, with JDBC adapter, the RecordNotFoundFault is defined for Retrieve and RetrieveAll operations only. Refer to each adapter's user guide for more details on different fault exceptions.



## Fault bindings

- Background
  - ▶ Only runtime supported Faults
  - ▶ Manual add related Fault tags in .wsdl and .import files
- Enable Faultbinding outbound artifacts generation in the discovery process
  - ▶ Automating the enablement of Faults in .import/.export files
  - ▶ Eliminate errors in manual works
- Migration from previous version of adapters
  - ▶ No automating the enablement of Faults
  - ▶ Remain same configurations before and after migration
  - ▶ Manual add related faults tags



Previously with V6.1, WebSphere Adapters required manual modification to the WSDL and the Import files in order to enable faults. The schemas of the BOs are generated, however the WSDL and Import files have to be modified to add the Fault Tags. With this new enhancement, the fault tags addition to the WSDL files is enabled automatically. Manual configuration of faults is no longer required which can then eliminate errors.

For users who migrate from previous version of adapters, the enablement of fault tags is not enabled automatically. The purpose is to remain same configuration before and after migration in case users want to use their own fault handling. Therefore, manual configuration related to fault tags is required to enable faults.

## Fault bindings

- Available for this release

WebSphere Adapters	Fault Bindings
Flat Files	X
FTP	X
Email	X
JDBC	X
Oracle EBS	X
JD Edwards	
SAP	X
Siebel	X
PeopleSoft	X
IBM i	

Here is the list of adapters that supports fault bindings for this version. Notice JD Edwards and IBM i adapters are currently not supported at this time.

## Section

# *Summary and reference*

This section provides the summary of the overview presentation.

## Summary

- This presentation covered an overview of the new and enhanced IBM WebSphere Adapters V6.2
  - ▶ Supported WebSphere environment variables
  - ▶ Provided event filtering for inbound processing
  - ▶ Enhanced retry connection options
  - ▶ Enhanced monitoring and logging
  - ▶ Enabled fault bindings



This presentation covered an overview of the new and enhanced IBM WebSphere Adapters for the 6.2 release. You have reviewed new features and enhancements including WebSphere variables, event filtering for inbound processing, and different retry connection options. The common monitoring and logging across all the adapters and common problem determination by using the log and trace files provided details of how to configure the different levels of messages that can be provided. Much of the common functionality has been moved into the adapter foundation classes. Finally, different fault handling exceptions have been introduced to distinguish from business exceptions from Resource Exceptions for outbound processing.

## References

- Java connector architecture  
<http://java.sun.com/j2ee/connector/index.jsp>
- Enterprise metadata discovery whitepaper  
<http://www.ibm.com/developerworks/java/library/j-emd/>



This page lists some references that can be helpful for additional resources.

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