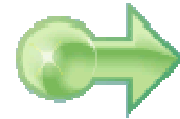




IBM Software Group

WebSphere® Process Server V6



WebSphere MQ Workflow migration



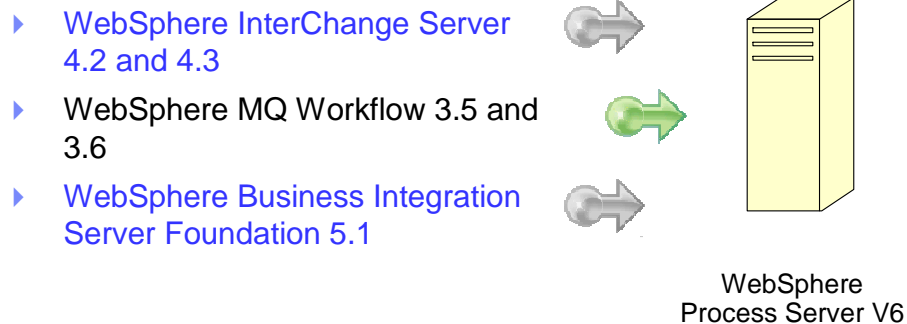
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This presentation will cover migrating to WebSphere Process Server V6.0 from WebSphere MQ Workflow.

Goals

- Detailed discussion of the migration utilities for WebSphere MQ Workflow



WebSphere Process Server is the merger of three existing product lines: the WebSphere InterChange Server, the WebSphere MQ Workflow and WebSphere Business Integration Server Foundation.

This presentation will discuss the details of migrating from WebSphere MQ Workflow.

Agenda

- Introduction
- Overview
- Migration
- Limitations

The agenda for this presentation is to focus on the steps involved in migrating from WebSphere MQ Workflow to WebSphere Process Server V6.

It begins with an introduction of background material and tasks that should be done before starting a migration effort, followed by a high level overview of the migration process.

This presentation concludes with a section on the known limitations and how they impact the migration process.

Introduction - Before you begin

- The mapping between WebSphere MQ Workflow and the WebSphere Process Server SCA programming model is not a perfect fit
 - ▶ There are limitations and workarounds which will require additional work in order to complete the source artifact migration process
- Before you begin:
 - ▶ Read the Migration Guide that is available in the WebSphere Business Process Integration Information Center
 - ▶ Review the WebSphere MQ Workflow best practices
 - ▶ Upgrade to WebSphere Integration Developer and WebSphere Process Server 6.0.2
 - ▶ Become familiar with the SCA programming model

Before you begin a migration, you should become familiar with the known limitations identified at the end of this presentation and be prepared to perform some post migration tasks.

You should also read the migration guide, review the best practices for WebSphere MQ Workflow development

Upgrade to WebSphere Integration Developer and WebSphere Process Server 6.0.2 and become familiar with the SCA programming model.

WebSphere MQ Workflow development

- Best practices:
 - ▶ Runtime clients: Use the browser based Web client of WebSphere MQ Workflow.
 - ▶ Human-facing activity implementations: Use or customize the JSP-based Web Client to implement JSPs for activities related to users. Do not use the program execution agent for such activities.



The best practices listed here have been published for current WebSphere MQ Workflow development as guidelines for mitigating potential problems when migrating to WebSphere Process Server V6.

For the runtime client, use the Web client, rather than the standard, ActiveX® - based Windows® runtime client. Do not implement a custom runtime client by using the C, C++ or ActiveX API.

For human-facing activities, use the Web client rather than the program execution agent.

Migrate automatic activity implementations:

- On all platforms: Use user-defined program execution server based implementations.
- On distributed platforms: Do not use the program execution agent.
- On z/OS®: Invoke legacy IMS/CICS® applications through the program execution server invocation mechanism and data mapping. Do not use the program execution server container API for such activities.
- API: Only use the Java™ API

Take a moment to review these 'best practices'.

Introduction - References

Information Center

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/index.jsp>

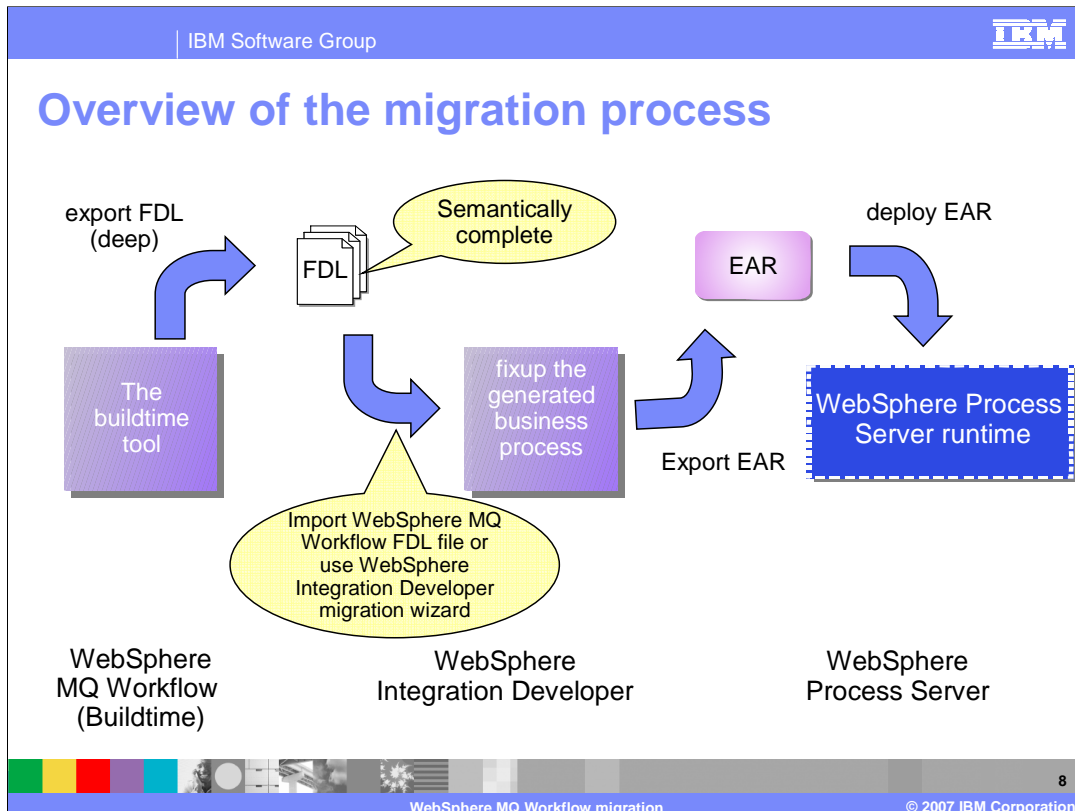
Select the book for WebSphere Integration Developer

Then on the right, select the topic migrating applications

Installing and migrating
[Installing WebSphere Integration Developer](#)
[Migrating applications](#)

The Information Center is an excellent place to get additional details about the migration process.

A PDF version of the migration guide is also available from the welcome page of WebSphere Integration Developer V6.



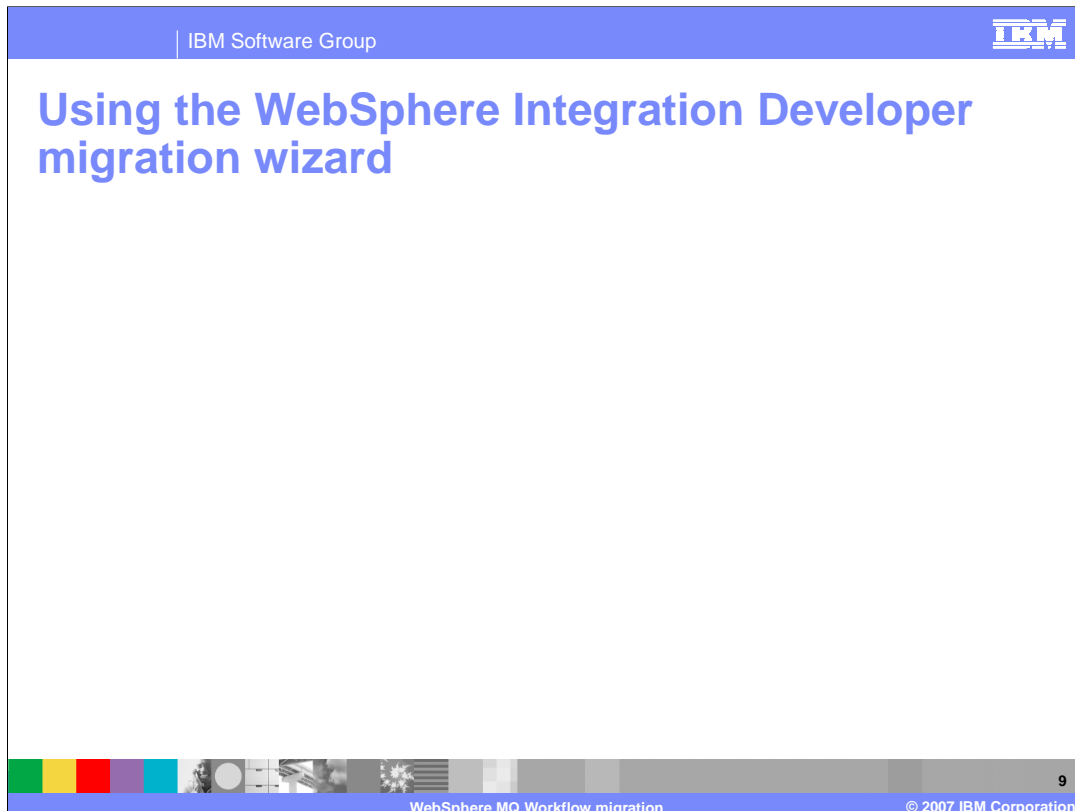
From a high level perspective, the migration process consists of the following steps. Export from the source system, import to the target system, edit, resolve errors and tune the migrated artifacts for BPEL / SCA. Then deploy the application to the WebSphere Process Server V6 runtime.

Beginning with the export, you should export the FDL from the WebSphere MQ Workflow environment using the WebSphere MQ Workflow buildtime tool. This requires a semantically complete FDL which requires an Export DEEP from the WebSphere MQ Workflow buildtime.

Next import the FDL into WebSphere Integration Developer V6 using the migration wizard or File -> Import. In WebSphere Integration Developer, fix the business processes to eliminate any errors based on the errors identified and the known limitations. Export the EAR and deploy it to the WebSphere Process Server V6 runtime.

The WebSphere Integration Developer migration wizard will call the import utility, which will call the FDL2BPEL utility.

The FDL2BPEL utility will generate the new artifacts which will be loaded into the appropriate WebSphere Process Server modules.

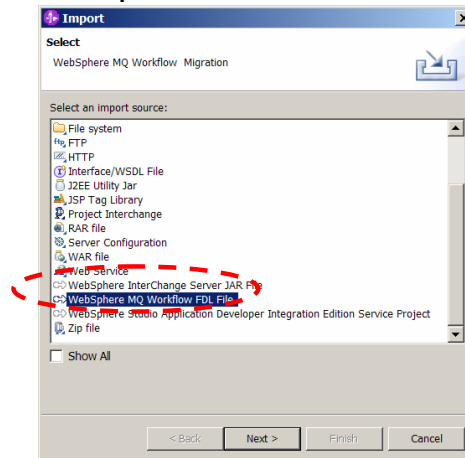


Using the migration wizard that comes with WebSphere Integration Developer V6 is the easiest way to get started. The migration wizard is launched from the welcome page. To locate the welcome screen in WebSphere Integration Developer, use the menu bar, **Help - > Welcome**.

The migration guide and the WebSphere MQ Workflow migration wizard are available from the migration page.

Using import

- You can also open the Migration wizard from the WebSphere Integration Developer “*Business Integration Perspective*” by clicking:
 - > File > Import > WebSphere MQ Workflow FDL file



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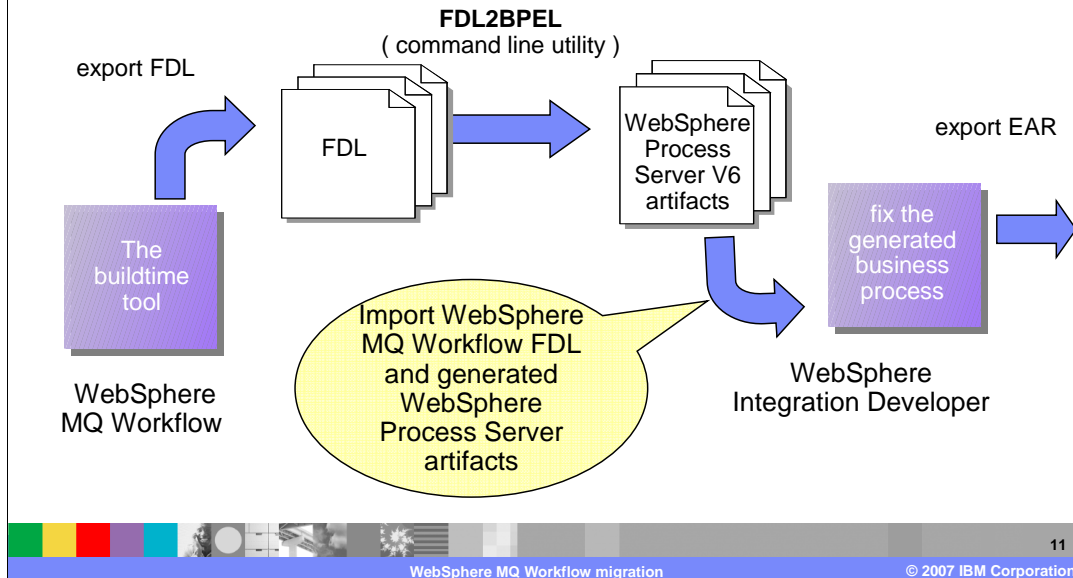
WebSphere MQ Workflow migration

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The Import function can also be used directly to invoke the Migration Wizard. WebSphere Integration Developer V6 has a special import type for the WebSphere MQ Workflow FDL file that will recognize the WebSphere MQ Workflow artifacts. It will launch the Migration Wizard, which will convert them to the appropriate WebSphere Process Server / BPEL artifacts as they are imported.

Overview: Alternative process

This alternative process is useful for debugging problems encountered with the migration wizard.



Alternatively, you can download the WebSphere MQ Workflow SupportPac WA73, which contains additional documentation and the FDL2BPEL utility. Using the FDL2BPEL utility directly from the command line with the FDL as input, the new source artifacts can be generated and then imported into the appropriate WebSphere Process Server V6 modules. Introducing this extra step can be useful when problems are encountered using the WebSphere Integration Developer migration utility, as the error reporting is more extensive with the command line tool.

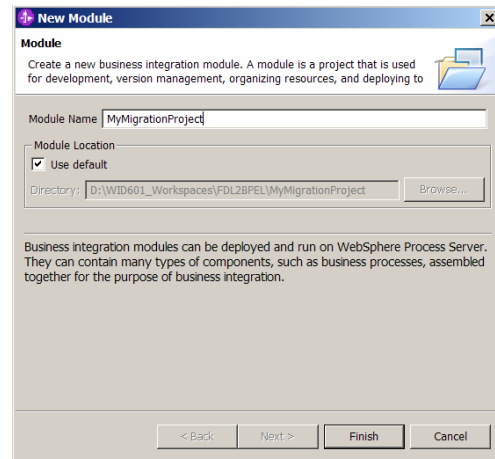
Using FDL2BPEL: Generate artifacts



The FDL2BPEL command line utility can be downloaded from the IBM Support site. The URL is available in the references section at the end of this presentation. Using the FDL2BPEL command line utility provides more control and error reporting, which is beneficial when debugging migration problems.

Using FDL2BPEL: Create a new module

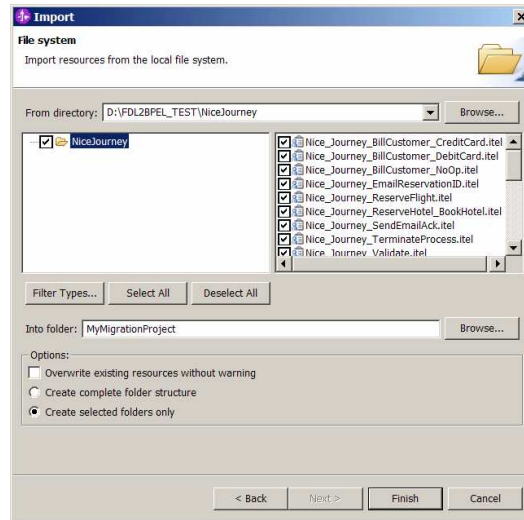
- From the business integration perspective, create a new module
 - ▶ **File → New → Project → Module**
 - ▶ make the module name the same as the value used for the command line parameter, **-oe**



After the new artifacts have been generated using the FDL2BPEL utility, the destination module must be manually created in the target workspace. Making the module name the same as the name used when generating the artifacts will reduce the amount of post migration rework.

Using FDL2BPEL: Import the generated artifacts

- From the resources perspective, select the project folder and import the generated files.
 - File → Import → File System



The next step is to import the generated artifacts into the newly created module and workspace.

Using FDL2BPEL



The WebSphere MQ Workflow SupportPac WA73 is provided to support WebSphere MQ Workflow users and is from the perspective of WebSphere MQ Workflow. The documentation that is provided with the SupportPac is more complete than that available in WebSphere Process Server V6 Information Center and will provide the technical background that will be familiar to WebSphere MQ Workflow users.

Note that the wiring of the module assembly will be part of the post migration work.

The post-migration fix-up step

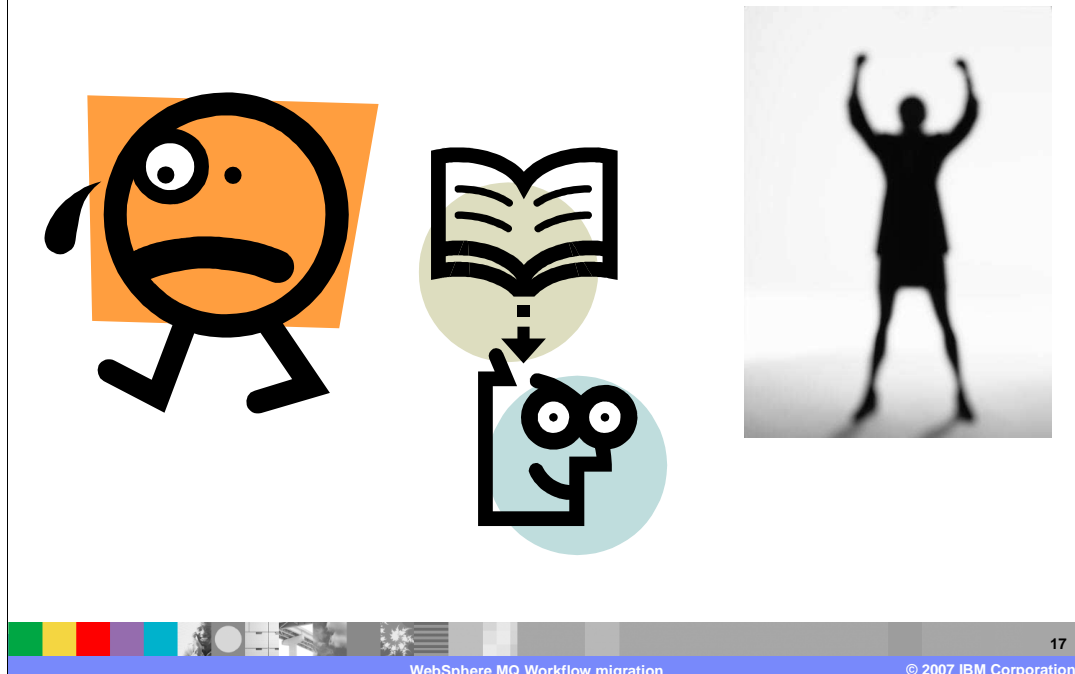
- The existing artifacts have been imported into WebSphere Integration Developer, the next step is to resolve all the errors and implement workarounds for the limitations.
- A separate presentation on Mapping FDL to BPEL will lay the groundwork for completing the fixup.
 - ▶ It provides the understanding for all the new artifacts that have been generated.
- The subsequent section will discuss the limitations.
 - ▶ Understanding the limitations will provide the information necessary for implementing any workarounds that may be necessary.

At this point all of the WebSphere MQ Workflow artifacts that can be converted, have been converted to WebSphere Process Server V6 BPEL / SCA artifacts. However, not all artifacts can be converted and there will be errors to correct and workarounds to implement.

A separate presentation will focus on what does get mapped. This presentation will highlight the limitations next.

This will provide the information needed to complete the migration so that the application can be deployed to the WebSphere Process Server V6 runtime.

WebSphere MQ Workflow migration limitations



When mapping from one programming model to another, different programming model there will always be some features that are new, different or missing and therefore require manual intervention.

The mismatch between the WebSphere MQ Workflow model and the WebSphere Process Server V6 SCA programming model is captured here in the form of limitations. Knowing the limitations and discontinuities ahead of time is extremely valuable in determining the amount of effort required to complete the migration.

Limitations: 1

- **BPEL has no equivalent activity type with a similar semantic as the FDL "program activity" construct.**



Hint

- Explanation: BPEL does not let you combine the invocation of a program application with the assignment of a work item to a user.
- You may want to modify the generated BPEL files and insert additional inline human tasks or invoke activities according to your requirements.

The FDL concept of a program activity means that the program execution agent runs the application on the workstation of the person who claimed the respective work item. With BPEL you cannot specify the location where the program runs as the location of the person.

You could insert additional synchronization points with user interaction. For example you could insert an inline human task that precedes an invoke activity so that you can decide when the respective service is allowed to run.

Limitations: 2

- **WebSphere Process Server does not support user-defined program execution server invocation**



Hint

1. Use WebSphere Integration Developer to turn the temporary staff activities or empty activities into invoke activities with an appropriate Java implementation
2. Use WebSphere MQ Workflow buildtime to turn user-defined program execution server activities into temporary staff activities or empty activities according to the above mentioned activity classification rules

WebSphere Process Server does not support user-defined program execution server invocation.

Limitations: 3

- The BPEL condition logic is dual-value logic as opposed to the ternary logic used in WebSphere MQ Workflow.



Hint

WebSphere MQ Workflow migration handles this by:

1. Data mappings that refer to unset source data members are ignored.
2. Conditions that refer to unset source data members are evaluated as "false".

The BPEL condition logic is dual-value logic as opposed to the ternary logic used in WebSphere MQ Workflow.

Limitations: 4

- **WebSphere MQ Workflow migration cannot map all staff queries that you specified for a WebSphere MQ Workflow process or its contained program activities.**



Hint

- You may have to replace some of the generated staff verbs by user-defined staff verbs if you need to have complex query logic.

WebSphere MQ Workflow migration cannot map all staff queries that you specified for a WebSphere MQ Workflow process or its contained program activities.

Limitations: 5

- **Some error and warning messages may not give you enough context information to understand the problem (such as "Illegal data path expression").**



Hint

- In such cases it is helpful to locate the same message in the generated files using a source editor (typically the files with extension "*.bpel").

While FDL2BPEL generates the target constructs, the context of a problem situation is sometimes unknown, and the appropriate information is not available to give a clear explanation. But the error message will always be inserted as a comment annotation at the respective location in the generated BPEL or WSDL file where the problem occurred. So, typically finding the same message in the file will help to understand the problem. For instance, the message "Illegal data path expression" might be found in a condition expression that refers to an undefined data member in the input variable of an activity.

Limitations: 6

- **The activity state "_Expired" in a condition expression cannot be appropriately mapped.**



Hint

- Explanation: Business Process Choreographer throws an exception in case of expiration.
- You can add a fault handler to the generated BPEL process in order to catch the "_Expired" state.

The activity state "_Expired" in a condition expression cannot be appropriately mapped.

Limitations: 7

- **The generated BPEL files do not always represent the most compact translation of a given WebSphere MQ Workflow process.**



Hint

- Explanation: WebSphere MQ Workflow migration applies a translation pattern that preserves the original process topology.
- You may want to do some reworking of the generated BPEL file in order to improve it.

A data connector that passes data unchanged from one activity to another might sometimes be better mapped to a shared BPEL variable. The FDL2BPEL conversion tool generates two BPEL variables and an "assign" activity that does the data mapping.

Limitations: 8

- The input / output data of a FDL process activity and input / output data of the respective sub process **must be the same** before you can convert to BPEL.



Hint

- Explanation: Other than FDL the BPEL specification does not allow a “subset” or “superset” relationship between data passed from one process to another.
- If you need such a combination you should modify the FDL model before migration or insert “*assign*” activities with data mapping instructions to the BPEL model after migration.

The input / output data of an FDL process activity and input / output data of the respective sub process must be the same before you can convert to BPEL.

Limitations: 9

- **BPEL does not support predefined data that are equivalent to the FDL predefined data members.**

Hint

- Nonetheless WebSphere MQ Workflow migration converts FDL data structures to corresponding message types that include the predefined data members like _RC, _ACTIVITY_INFO and so on
- You may run WebSphere MQ Workflow migration with an option that requests the initialization of the predefined data members _ACTIVITY, _PROCESS, and _PROCESS_MODEL.

Business process choreographer does not offer support for setting predefined data members.

Limitations: 10

- **Not all properties that you can specify in FDL have a corresponding BPEL notion.**



Hint

- Respective warnings in the FDL2BPEL output will inform you about such limitations.

The concept of a global container is not yet supported in BPEL. Nevertheless, the WebSphere MQ Workflow migration generates a BPEL variable for it.

Limitations: 11

- Migration does not work properly with FDL input files containing a version ID before "FM_RELEASE V3R6"



Hint

- Migrate the FDL file using MQ Workflow buildtime with V3.6 or later before you run the FDL to BPEL migration.

FDL input files created before the FM_RELEASE V3E6 can not be converted.

Summary

- Migrating from WebSphere MQ Workflow to BPEL / SCA is not a perfect fit.
 - ▶ There is post migration work involved.
- The process is one of
 - ▶ Export from WebSphere MQ Workflow
 - ▶ Import to WebSphere Integration Developer
 - Migration wizard
 - Import
 - FDL2BPEL + Import
 - ▶ Tune the new model for BPEL/SCA
 - ▶ Deploy to the WebSphere Process Server runtime
- What can be mapped is well defined
- There are some WebSphere MQ Workflow features that are not migrated to BPEL/SCA and this is captured in the Limitations section.



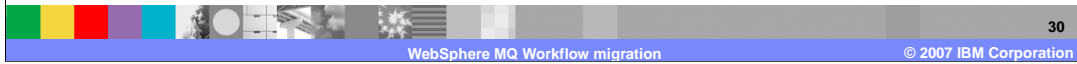
To summarize, depending on the complexity of the WebSphere MQ Workflow application there will be some post migration work involved.

The basic process is to export the application from the source system, import to the target system, edit, resolve errors and tune the application for BPEL / SCA. You can also deploy the application to the WebSphere Process Server V6 runtime.

References

- WA73 SupportPac

- ▶ http://www-1.ibm.com/support/docview.wss?rs=171&uid=swg24008362&loc=en_US&cs=utf-8&lang=en



The WA73 SupportPac contains the FDL2BPEL utility and documentation.

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