



IBM Software Group

WebSphere Business Integration V6.1

Adapter migration infrastructure



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This presentation covers the migration infrastructure of the IBM WebSphere® Adapters.

Agenda

- Overview
- Migration wizard
- Migration tasks
- Migration validation
- Summary and references



This presentation starts with an overview of migration infrastructure, then introduces the migration wizard steps and the different types of migrations tasks. At the end, you will get to look at various migration validations

Section

Overview



This section provides the overview of the migration infrastructure.

Overview: Terminology

- “Update” means replacement of the previous version of the adapter with the latest version
- “Migration” mean changing adapter client artifacts and adapter configuration for the latest offered
- The “latest release” and “this release” is V6.1
 - ▶ Supported prior release for all adapters – V6.0.2
 - ▶ Supported prior release for PeopleSoft Adapter – V6.0



Some conventions are used throughout this presentation. The word “update” means replacement of the previous version of the adapter with the latest version. The word “migration” means changing adapter client artifacts and adapter configurations to the latest offered. The “latest release” and “this release” is V6.1. Finally, “prior releases” are the supported earlier release for the migration.

The prior release for all adapters is V6.0.2 with exception of the PeopleSoft Adapter. Because there was no PeopleSoft Adapter V6.0.2, its supported prior release is V6.0

Overview: Goals

- Minimal user input to achieve the same results
- Old settings are preserved wherever possible.
- Minimize development effort for particular instances
 - ▶ Provide a flexible, generic infrastructure that can be reused from release to release and adapter to adapter.
 - ▶ Metadata driven approach wherever possible.
 - ▶ Default implementations for typical tasks.
 - ▶ Well defined extension points and APIs for adapter specific contributions.
 - ▶ Helper classes, utilities.
 - ▶ Isolate adapter specific contributions from the complexities of the underlying technologies used for development (Eclipse frameworks, models)



The goal of this migration infrastructure is to establish common mechanisms to automatically migrate from the previous version to the new version of the adapters. The goals listed here are addressed through this approach. This migration infrastructure requires minimal user input to achieve the same results, since old settings are preserved wherever possible. It also minimizes development efforts and provides a generic infrastructure to be reused from release to release and adapter to adapter.

Overview: Compatibility with earlier versions

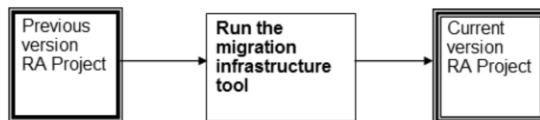
- Support compatibility with previous versions
 - ▶ Artifacts and configurations do not need to change
 - ▶ Same functionality runs unchanged
- Upgrade procedures with new adapter RAR through:
 - ▶ WebSphere Integration Developer
 - Run the migration wizard
 - De-select dependent modules
 - ▶ WebSphere Process Server
 - From administrative console, select the application
 - Navigate to the RAR module
 - Select it and choose option Update
 - Update existing RAR file with new RAR file



A new version of the adapter should be compatible with earlier versions. In this case, artifacts and configurations of the adapter client applications do not need to change with the new version of the adapter. It means that all the old functionality runs unchanged or better. To upgrade with a new adapter resource archive, or RAR, you have two options. You can upgrade through WebSphere Integration Developer by running the migration wizard and de-selecting dependent modules; this means only the RAR file gets upgraded and dependent modules remain unchanged. Or you can update the existing RAR file with a new RAR file using the administrative console of WebSphere Process Server.

Migration infrastructure – What is it?

- Need to seamlessly update application artifacts and configurations to the latest version
 - ▶ Established common mechanisms
 - Provide to users a way to automatically migrate from the previous to the new version of adapters
 - ▶ Supported prior release for all adapters – V6.0.2
 - ▶ Supported prior release for PeopleSoft Adapter – V6.0

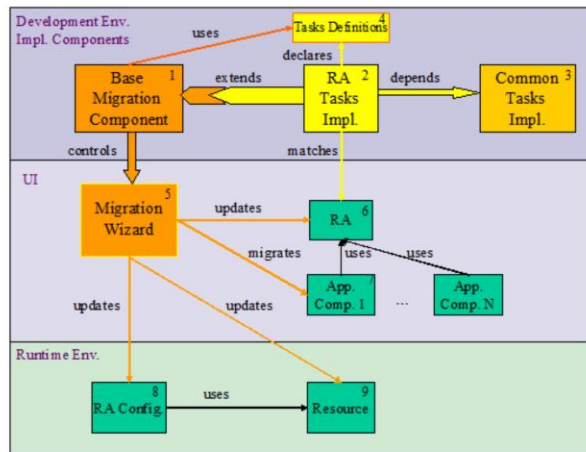


In the case of compatibility with earlier versions, you might be running with some deprecated interfaces and configurations and may not take advantage of the new interfaces and configurations. In order for you to seamlessly update the application artifacts and configurations to the latest version, automatic migration tools are provided.

The scope of the modifications includes the connector project and the artifacts generated by the ESD. As a result of the migration, clients of the modified adapter modules might break. However, the creation of the mitigating code (for example, mappers and mediators) is not in the scope of these migration tools. Tasks that may break external interfaces are grouped under the “migration” category and you can choose not to run them.

Overview: Migration wizard

- **Migration wizard** is provided through WebSphere Integration Developer plug-in.
 - ▶ Uses the infrastructure to retrieve metadata and invoke the particular sequence of migration tasks defined for an adapter.
- **Base migration component:**
 - ▶ Provides support for metadata retrieval for the wizard
 - ▶ Defines the common interfaces to be implemented by individual contributions
- **Contributions – potentially two levels:**
 - ▶ Common task implementation - release contributions provide default implementations for migration tasks that are common to the entire release. Adapters can use those entirely or in part (by subclassing).
 - ▶ RA task implementation - adapter specific contributions : metadata (per structure defined by the base infrastructure) and migration task implementations



The migration wizard is provided as a WebSphere Integration Developer plug-in that uses the infrastructure to retrieve metadata and invoke the particular sequence of migration tasks defined for an adapter

The base migration component is an extensible tool. It drives the interface for collecting user input. The tool is installed on your development environment and set to update the resource adapter to its new version. It migrates a set of artifacts of the dependent application components, the resource adapter's runtime configuration, and other resources used by the resource adapter.

The base migration component has an extension point that the resource adapter tool extends in order to provide the migration mechanism. While multiple resource adapter tools can provide extensions, the base migration component matches the one with the resource adapter in your environment and performs the correct update and migration. The base migration component matches the correct resource adapter tool extension by the resource adapter name and version, which are parameters of the extension.

Resource adapter tools need to specify a list of migration tasks to be performed on your environment. The structure and the format of the tasks specification is defined by the base migration component. The task list defines the task order and specifies task implementation classes. Task implementation classes are provided by the individual resource adapter extensions. When processing resource adapter extensions, the base migration component reads in the task definitions and configures the interface to collect input required by the tasks. When all the required input has been collected from you, the migration tool performs the tasks on your resources.

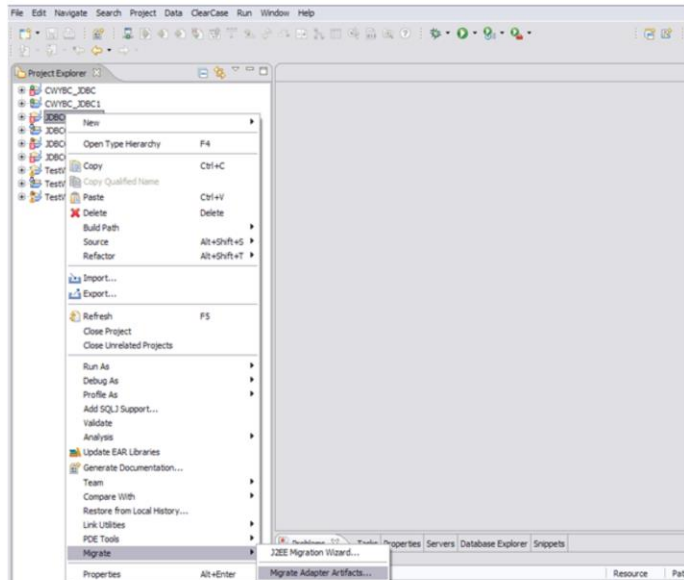
Section

Migration wizard

This section provides the steps to run the migration wizard

Migration wizard flow

- An Eclipse-based tool that drives the migration process
- Its function is driven by the metadata specified at the adapter level and the APIs implemented in the extension plug-in.
- Invoke from three locations:
 - ▶ Through connector project pop-up menu while in the J2EE™ perspective.
 - ▶ Through the module project pop-up menu while in the J2EE perspective.
 - ▶ Using the Quick Fix action in the validation marker pop-up menu.



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Adapter migration infrastructure

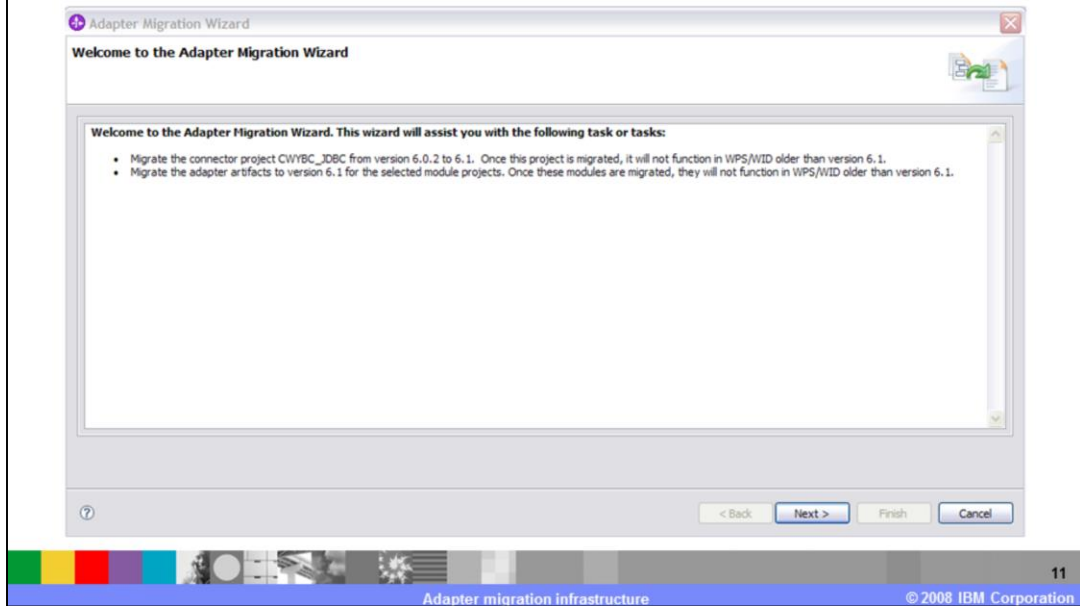
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The migration wizard is an Eclipse-based tool that drives the migration process. Its function is driven by the metadata specified at the adapter level and the APIs implemented in the extension plug-in.

The migration wizard can be invoked from three locations. The first invocation method is through connector project pop-up menu while in the J2EE perspective. The second method is through the module project pop-up menu while in the J2EE perspective. The third method of invocation is using the Quick Fix action in the validation marker pop-up menu.

Migration wizard flow

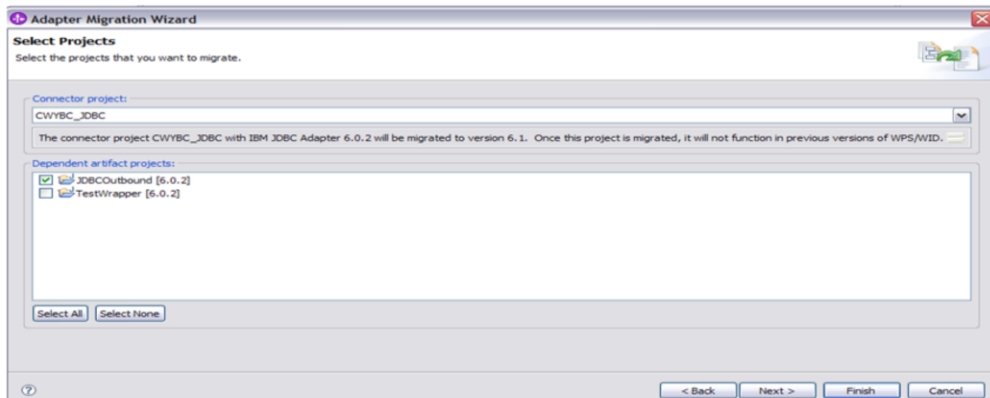
- Launch wizard with a welcome page



Once the update is initiated, the migration wizard launches and presents you with a welcome page. The welcome page shows you the functions that the migration wizard will perform based on the migration validation criteria. Additionally, the welcome page warns you that once migration completes, the connector project or module that has been migrated will no longer be compatible with the previous version of WebSphere Process Server or WebSphere Integration Developer.

Migration wizard flow

- Select the connector projects and dependent artifacts projects
- Warning message
- Previously migrated modules have "Migrated" tag beside their names
- A set of migration tasks is performed
- Selected modules artifacts and application resources are migrated according to those tasks



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Adapter migration infrastructure

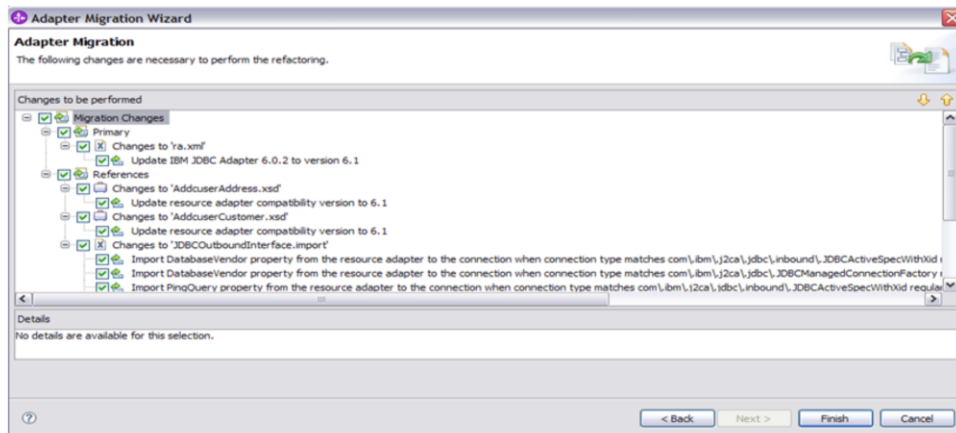
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Before proceeding with the updates to the connector project, the adapter migration wizard searches for the available update packages. Once an adapter update package is found, its target name and version are compared to the name and version of the adapter in the selected connector project.

Next, the migration wizard displays the connector and dependent project selection page exemplified in the slide. The connector project options include all the connector projects referenced in the module. If the wizard is invoked from the connector project itself, only that connector project is available. The description below the connector project selection shows the status of the connector project. The dependent project should have the current module version listed next to it. By default, the dependent artifact projects are migrated with the connector project; however, you have the option to uncheck and thereby exclude the dependent projects from migration.

Migration wizard flow

- Optional preview page
- See all tasks that are to be performed
- Not recommend to deselect any tasks



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Adapter migration infrastructure

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The last panel of the wizard is an optional preview, where you can see what tasks are to be performed. You can click Finish on the wizard, without going to this panel.

This panel lists two tasks groups. First are the tasks processed on connector project, including RAR update, libraries and class path update. Second are the tasks run on dependent module project. Tasks that perform any migration changes may NOT be compatible with earlier versions, that is, clients of the application modules may break.

Upon wizard completion triggered by the Finish button, for each selected application module a set of migration tasks specified in the Adapter update package is performed. Selected modules' artifacts and application resources are migrated according to those tasks.

When rerun, the previously migrated connector project and dependent modules are marked and described as already migrated. The migrated modules cannot be selected again, and no tasks are assigned to a previously migrated module. If artifacts are inconsistent in version handling within a single module, this module is marked as such, is not selectable for migration, and does not have any associated tasks. Version inconsistencies are recorded in the workspace log, since this might be a symptom of project corruption.

Section

Migration tasks



The next section provides the migration tasks

Migration tasks

- Migration metadata constraints are:
 - ▶ Value of adapter/name attribute in metadata file should match the name of the adapter to be updated.
 - ▶ Value of adapter/version attribute in metadata file should match the target version of the adapter.
 - ▶ Value of one of the update/version attributes in metadata file should match to the version of the adapter to be updated.
- Dependent libraries update
 - ▶ No support configuration updates.
 - ▶ The configuration changes should be performed using the EMD wizard configuration page.



Migration metadata constraints are shown here.

The adapter's name attribute in the metadata file should match the name of the adapter to be updated, that is, to the connector's display-name attribute from the ra.xml file.

The adapter's version attribute in metadata file should match the target version of the adapter; it should match to connector's resourceadapter-version attribute from ra.xml file in the target RAR file.

One of the "update-version" attributes in metadata file should match the version of the adapter to be updated, that is, to the connector's resourceadapter-version in the ra.xml file.

Standard migration tasks

- Supported migration changes
 - ▶ Changes to the application component artifacts
 - Data types (SDO XML Schemas)
 - Interface files (WSDL)
 - Inbound services description (SCA model export with EIS bindings)
 - Outbound services description (SCA model import with EIS bindings)
 - ▶ Changes to the external resources

The migration tasks perform changes to the workspace resource and to external resources. These changes include changes to the application component artifacts and changes to the external resources. For application component artifact changes, a set of migration tasks is provided to run on each adapter SCA module. These tasks include updating export files, interfaces, business objects structure and application specific information for both inbound and outbound.

An adapter may also use resources that are not part of the application component, such as databases. Depending on the way external resources are set up and configured, there are possible options to migrate them to support the latest version of the adapter. The adapter can migrate resources on the startup at runtime, or resources can be migrated once manually before running the migration wizard. Finally, the migration wizard task can be implemented based on the resource configuration parameters and run from the migration wizard. External scripts and resource drivers can be used in the implementation.

Section

Migration validation



This section covers migration validation.

Migration validation

- Performs project version validation on the connector projects and adapter service modules.
- Used to notify you with information on version compatibility and mismatching.
- Allows you to correct the issue



The migration tool performs project version validation on the connector projects and adapter service modules based on set criteria in determining artifact compatibility. The migration tool notifies you about version compatibility and mismatching, and allows you to correct the discrepancy.

Migration validation criteria

- Adapter migration validation criteria and API
 - ▶ Connector project is compared to the latest RAR file adapter version
 - ▶ Adapter service file is compared to the corresponding connector project
 - ▶ Business objects schema file is compared to corresponding connector project
- Visual markers for projects requiring migration
 - ▶ Connector project validation markers:
 - **Warning** - generated for the connector project when there is later version of the adapter available under the known installed location
 - ▶ Adapter artifacts validation markers:
 - **Warning** - generated for the module that has artifacts for which version does not match the adapter version or version is unknown
 - **Error** - generated for the module that has mixed version of business objects related to the same service

Determining artifact compatibility is based on a set of validation criteria.

For each connector project, the adapter name and version are compared to the latest RAR file adapter version. If they do not match, the validation fails and a warning marker is generated for the connector project. For each adapter service file (import/export), the adapter name and adapter version is captured and compared to the adapter version found in the corresponding connector project. If they do not match, the validation fails, and a warning marker is generated for the file. Furthermore, the corresponding BO schema files are discovered from the WSDL file which corresponds to the service. Similarly, for each BO schema file, the adapter name and adapter version is captured and compared to the adapter version found in the corresponding connector project. If they do not match, the test fails, and a warning marker is generated for the file. Additionally, if the schema adapter version does not match the service adapter version, an error marker is generated.

After the migration wizard runs, the connector project content is replaced with the content of the latest adapter RAR. Adapter artifacts may or may not be migrated after a connector project update, depending on your selection of the project's required migration. When adapter artifacts are selected for migration, they get updated with the new adapter version after the migration tasks are performed. If migration fails, no update of the versions is performed. The migration tool can be restarted again on the same module until all the artifacts are migrated to the new adapter version.

Visual markers are produced by the adapter migration validators on the task list for the connector project and application module that has adapter artifacts. Validation markers are also shown on the project views and artifact editors. Connector project validation markers include warnings generated for the connector project when there is later version of the adapter available under the known installed location. Adapter artifacts validation markers include warnings generated for the module that has artifacts for which the version does not match the adapter version or the version is unknown. Markers are also created for errors that were generated for the module that has mixed versions of the artifacts related to the same service.

Migration validation criteria

- Resource adapter version in the adapter artifacts
- Validation markers
- Other messages
- Migration validator configuration
- Integration with WebSphere Integration Developer
- Performance considerations and optimizations

Continuing on with migration validation, a version number in the adapter artifact means that the artifact is generated by or migrated to this version of the adapter. This also means that this artifact is compatible with this version of the adapter. Adapter artifacts versions are produced by the EMD tools for the newly generated artifacts, and by the migration wizard for the existing artifacts. Each adapter service and data type file requires adapter versions because there are possible scenarios where mixed versions of the adapter artifacts are present.

Adapter migration validation contributes a validation command for WebSphere Integration Developer application modules. The “Validator-sourceID” attribute is set to the IBM WebSphere Adapter migration infrastructure component ID, which is CWYAM.

Finally, the validator uses XML file streaming APIs for finding adapter versions in the artifacts. As soon as the version, which is typically at the top of the file, is verified on the specified path, the validator returns the result. This does not have any significant impact on the project validation time and resource usage is minimal.

Section

Summary

And, in summary,

Summary

- Introduced new WebSphere Adapter migration infrastructure in V6.1
- Described the steps in the migration wizard
- Learned different migration tasks
- Looked at different set criteria for migration validation



You have been introduced to the new WebSphere Adapter migration infrastructure in V6.1. You saw the steps involving in the migration wizard and the different migration tasks that run from the wizard. At the end, you saw the migration validator and learned different criteria for migration validation.

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