

Using the Software AG IDL Extractor for Natural

This chapter describes how to use the Software AG IDL Extractor for Natural. It covers the following topics:

- Extracting IDL from Natural Subprogram Sources in NaturalONE
 - Extracting Software AG IDL File from a New Natural RPC Environment
 - Extracting Software AG IDL File from an Existing Natural RPC Environment
 - Extraction Result
 - Preferences
-

Extracting IDL from Natural Subprogram Sources in NaturalONE

In a NaturalONE project in Software AG Designer, IDL can be extracted directly from Natural subprogram sources (CALLNATs), using the following steps:

- Step 1: Start the IDL Extractor for Natural Wizard
- Step 2: Select the Natural Library from NaturalONE Project (Optional)
- Step 3: Select the Natural Subprograms from NaturalONE Project

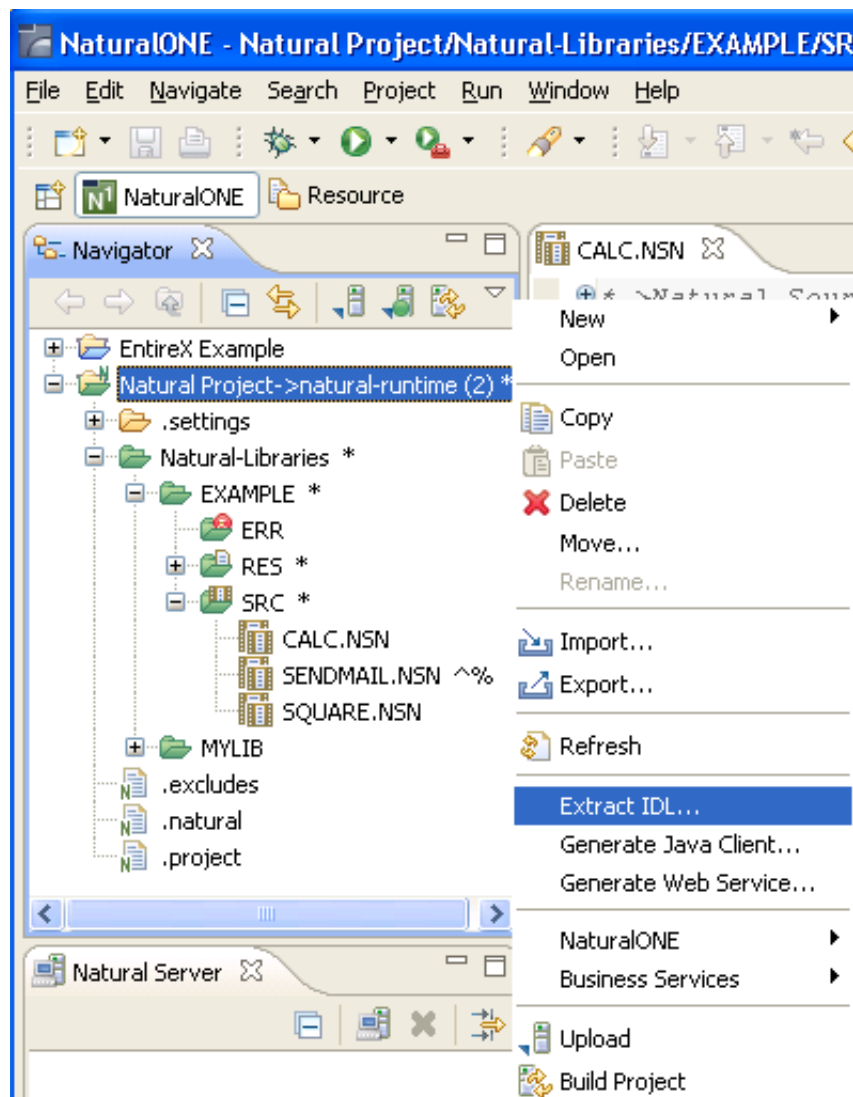
Step 1: Start the IDL Extractor for Natural Wizard

There are various ways of starting the IDL Extractor for Natural Wizard:

- Select a NaturalONE Project
- Select a Natural Library in a NaturalONE Project
- Select Natural Subprograms in a NaturalONE Project

Select a NaturalONE Project

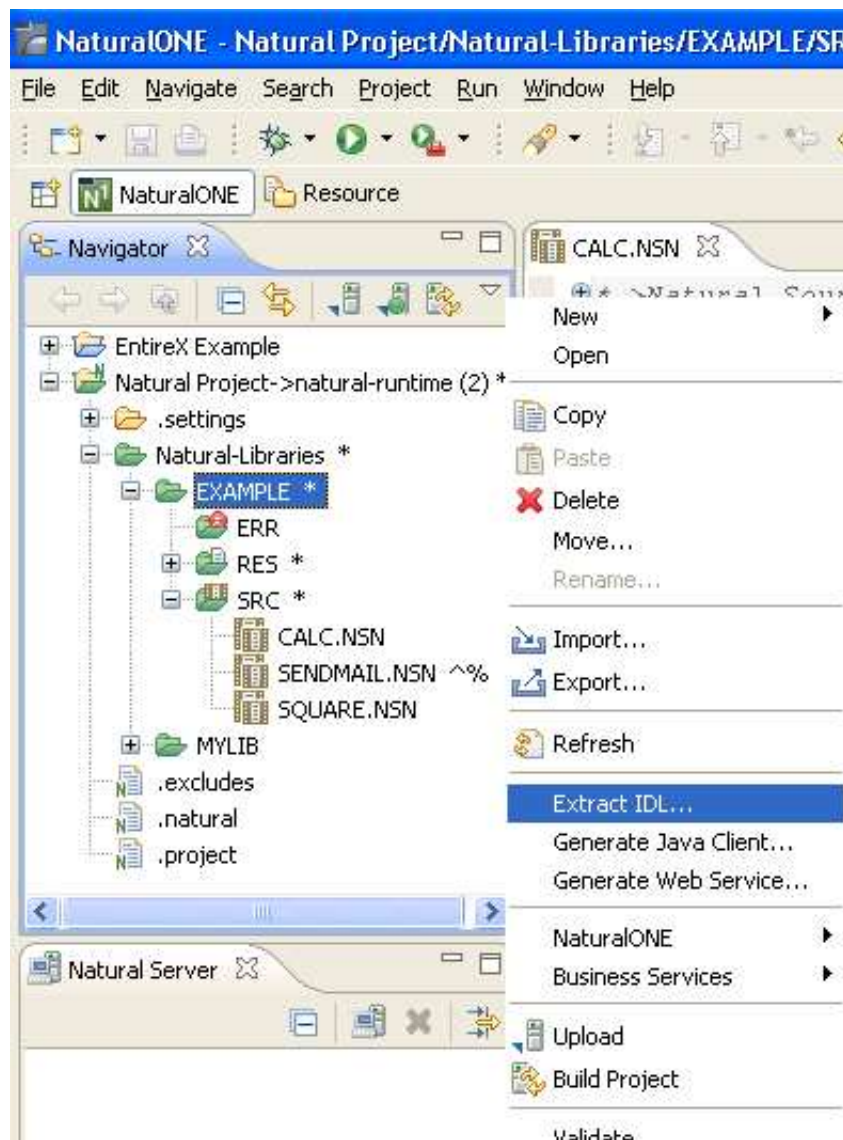
To extract the IDL, select the NaturalONE project in the Software AG Designer.



From the context menu, choose **Extract IDL...** and continue with *Step 2: Select the Natural Library from NaturalONE Project (Optional)*.

Select a Natural Library in a NaturalONE Project

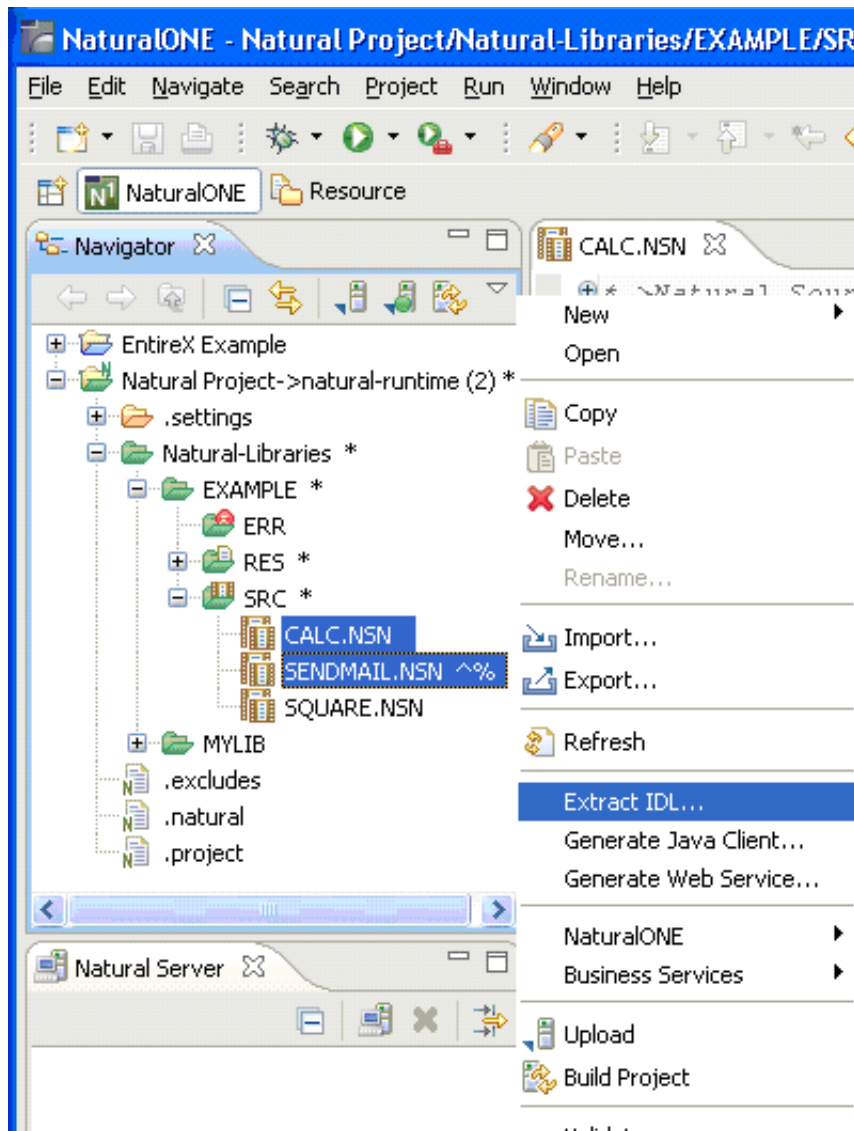
To extract the IDL, select the NaturalONE project in the Software AG Designer.



From the context menu, choose **Extract IDL...** and continue with *Step 3: Select the Natural Subprograms from NaturalONE Project*.

Select Natural Subprograms in a NaturalONE Project

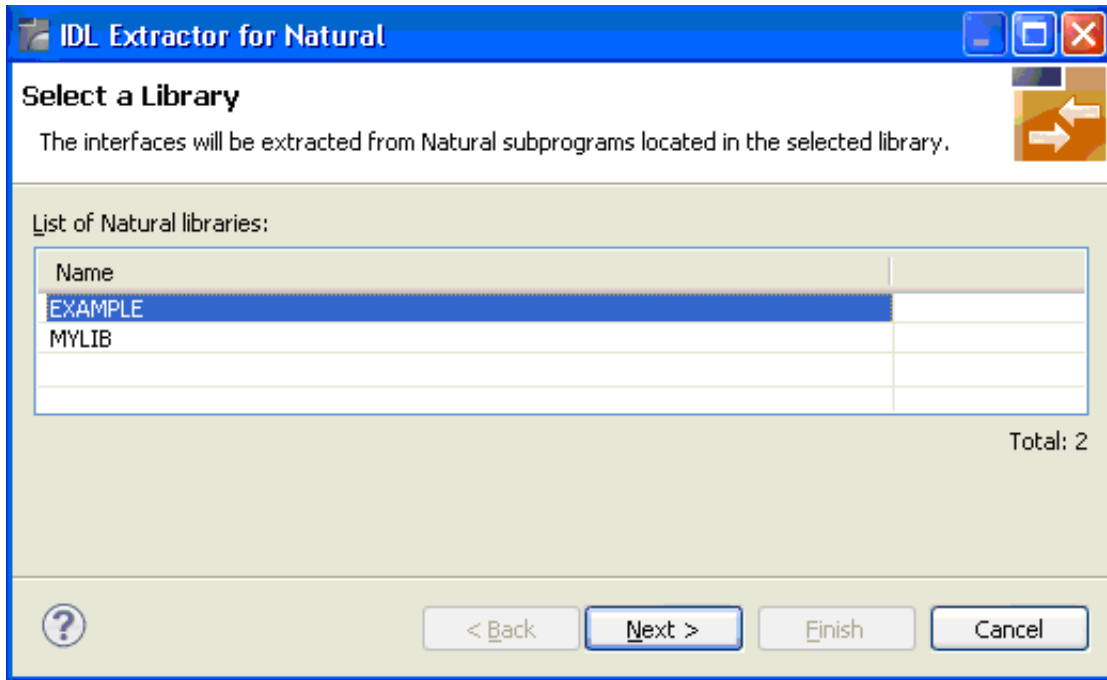
To extract the IDL, select one or multiple Natural subprogram sources (.NSN) in the Software AG Designer.



From the context menu, choose **Extract IDL...** and continue with *Step 3: Select the Natural Subprograms from NaturalONE Project*.

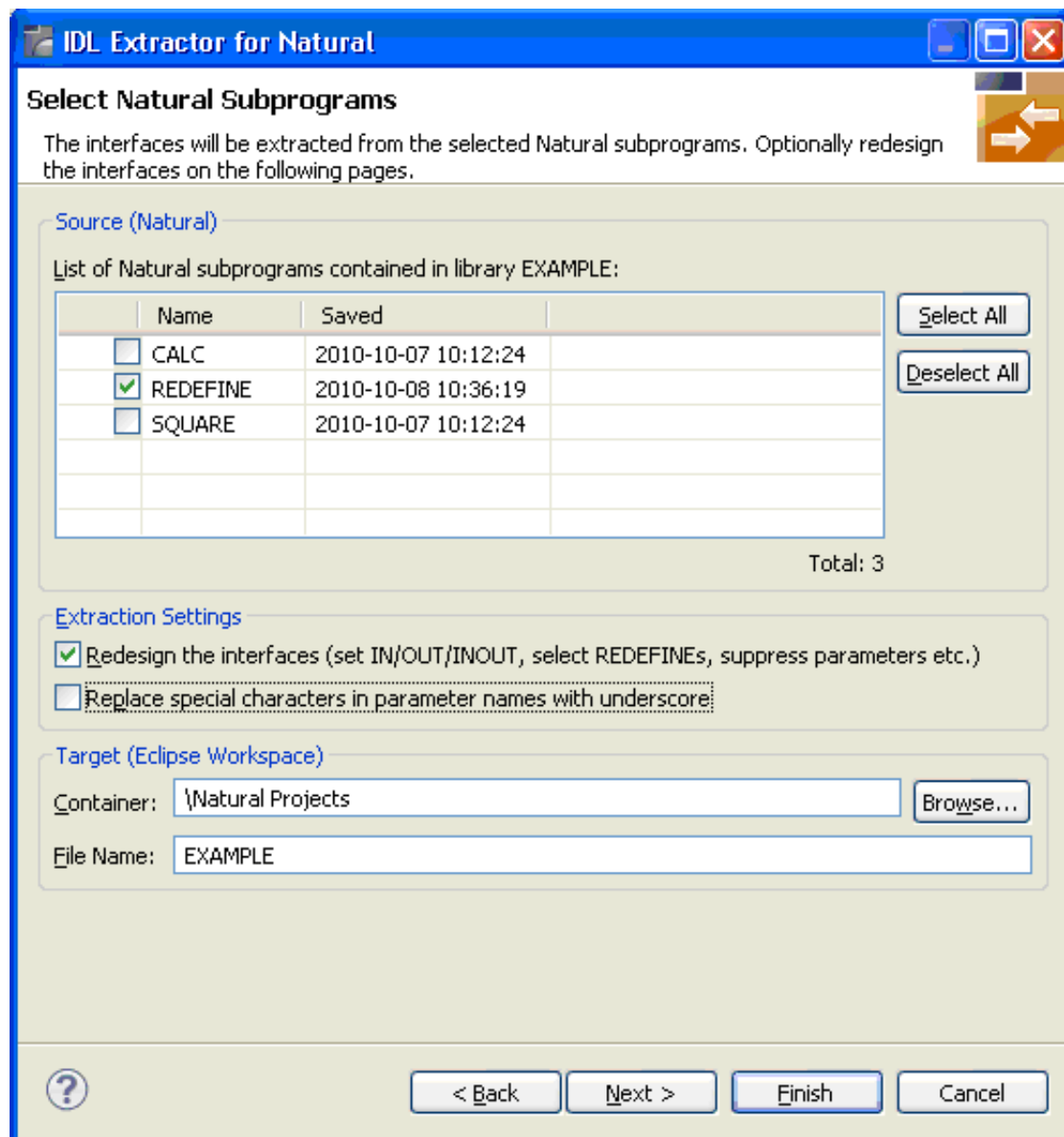
Alternatively, you can start the IDL Extractor for Natural from the context menu of the Natural source folder or any parent folder in the project, including the Natural library and the Project folder.

Step 2: Select the Natural Library from NaturalONE Project (Optional)



Select the Natural library from the list and choose **Next** to continue with *Step 3: Select the Natural Subprograms from NaturalONE Project*.

Step 3: Select the Natural Subprograms from NaturalONE Project



In the **Source** pane, select at least one program from the list of Natural subprograms (CALLNATs). You can also choose **Select All** or **Deselect All**.

In the **Extraction Setting** pane, check **Redesign the interfaces** if you want to design the extracted interfaces to the Natural subprograms. The **Next** button will be enabled. See *Redesigning the Extracted Interface*. If you do not check **Redesign the interfaces**, see *Natural to IDL Mapping* for default mappings.

By checking **Replace special characters in parameter names with underscore** under **Extraction Setting**, the special characters ("\$", "#", "&", "@", "/") allowed in Natural parameters can be replaced by underscores, see also *Extracting IDL Parameter Names*.

In the **Target** pane, select the container where the IDL file will be stored. Enter the file name of the new IDL file. If the IDL file exists, it will be overwritten. Preserving the *Software AG IDL File* and optional mapping file allows you to customize the IDL (alias names, in/out/inout modifiers) for subsequent optimized client generation steps. See *Server Mapping Files for Natural* in the EntireX Workbench documentation.

Choose **Next** to redesign the interfaces. See *Step 6: Redesign the Interface for Natural Subprograms (Optional)*. To enable the **Next** button, check **Redesign the interfaces**.

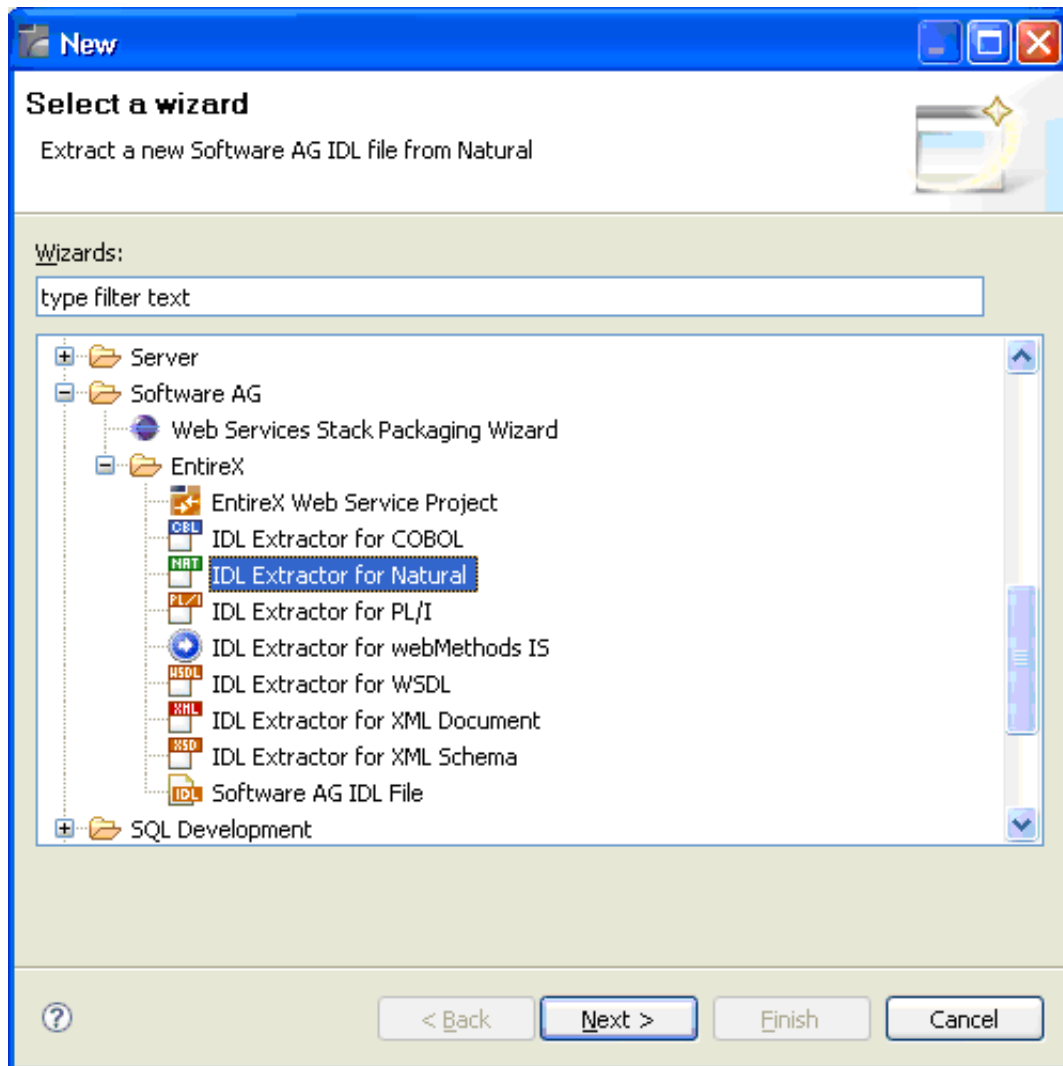
Choose **Finish** to start extraction with a default mapping. For more information see *Extraction Result*.

Extracting Software AG IDL File from a New Natural RPC Environment

This section covers the following topics:

- Step 1: Start the IDL Extractor for Natural Wizard
- Step 2: Create a New RPC Environment
- Step 3: Edit RPC Environment
- Step 4: Select Natural Library from RPC Environment (Optional)
- Step 5: Select Natural Subprograms from RPC Environment
- Step 6: Redesign the Interface for Natural Subprograms (Optional)

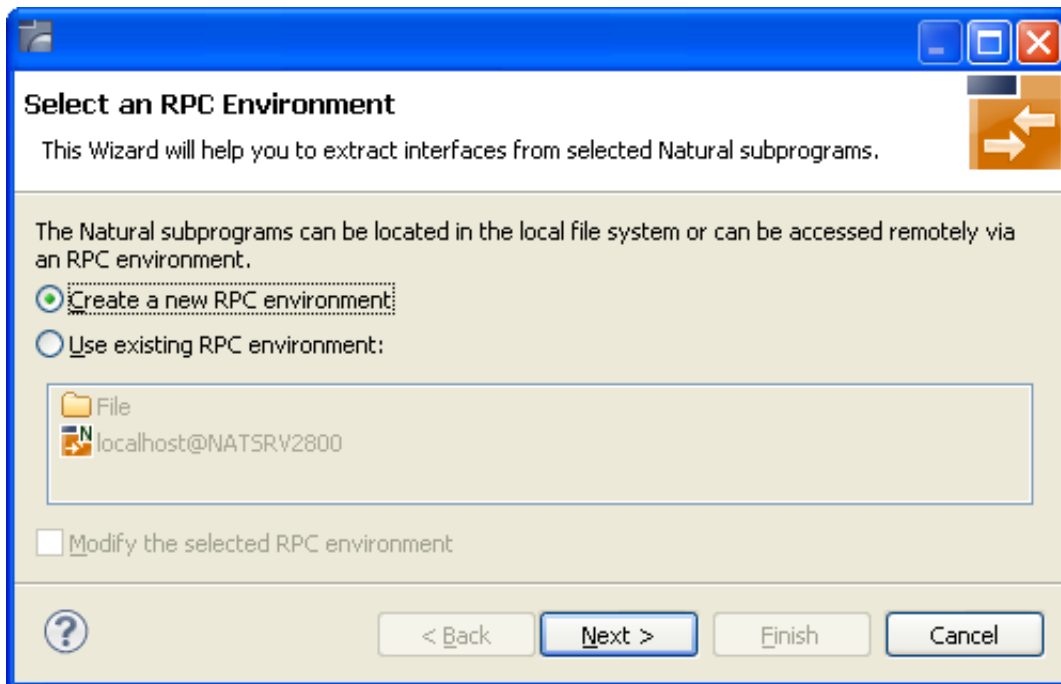
Step 1: Start the IDL Extractor for Natural Wizard



Press **Next** and continue with *Step 3: Edit RPC Environment*.

Step 2: Create a New RPC Environment

If no RPC environments are defined, you only have the option to **Create a New RPC Environment**. The RPC environments are managed in the *Preferences*.



Choose **Create a new RPC Environment** and press **Next** to create a new RPC environment. Continue with *Step 3: Edit RPC Environment*.

Note:

The folder **File** and the RPC environment **localhost@NATSRV2800** (default RPC server for NaturalONE) are available only if NaturalONE plugins are installed.

Step 3: Edit RPC Environment

IDL Extractor for Natural

Edit RPC Environment
Define a new RPC Environment.

Broker Parameters

Broker ID: * ibm2:3762

Server Address: * RPC/NPC42X6/CALLNAT Edit...

Timeout (Seconds): 60

EntireX Authentication

User ID:

Password:

RPC Server Authentication

RPC User ID:

RPC Password:

Extractor Settings

Enter names, or use filter for range of values (wildcards * and ? on any position, < and > as final character only).

Library Name: NRPC*

Program Name: CO>

Wrapper Settings

Save locally

Save remotely

Target Library Name: *

Environment Name

Default (ibm2:3762@RPC/NPC42X6/CALLNAT)

Other: ibm2:3762@RPC/NPC42X6/CALLNAT

? < Back Next > Finish Cancel

Define the new RPC environment on this page. Required fields are **Broker ID**, **Server Address** and the **Environment Name**. The timeout value must be in the range 1-9999 seconds (default: 60).

The **EntireX Authentication** fields apply to the broker.

The **RPC Server Authentication** fields apply to the RPC server. If the Natural RPC Server operates under Natural Security,

- your user ID and password must be defined in Natural Security. If the Natural Security user ID or password differs from the broker user ID and password, use **RPC Server Authentication** - otherwise use **EntireX Authentication** for both.
- access to the Natural system library SYSIDL is required

Note:

Users who do not have access rights to the Natural system library SYSIDL are not allowed to extract IDL from your Natural environment.

With **Extractor Settings**, specify the Natural library and program name from which you want to extract. You have the following options to select a range of Natural libraries and programs:

- wildcard asterisk "*" (any position) to list libraries or program names matching any sequence of characters.
- wildcard question mark "?" (any position) to list libraries or program names matching any single character.
- wildcard greater than ">" (final character only) to list libraries or program names after.
- wildcard lower than "<" (final character only) to list libraries or program names before.
- no wildcard to extract from the given library or program. If the library or program does not exist, an error message will be displayed.

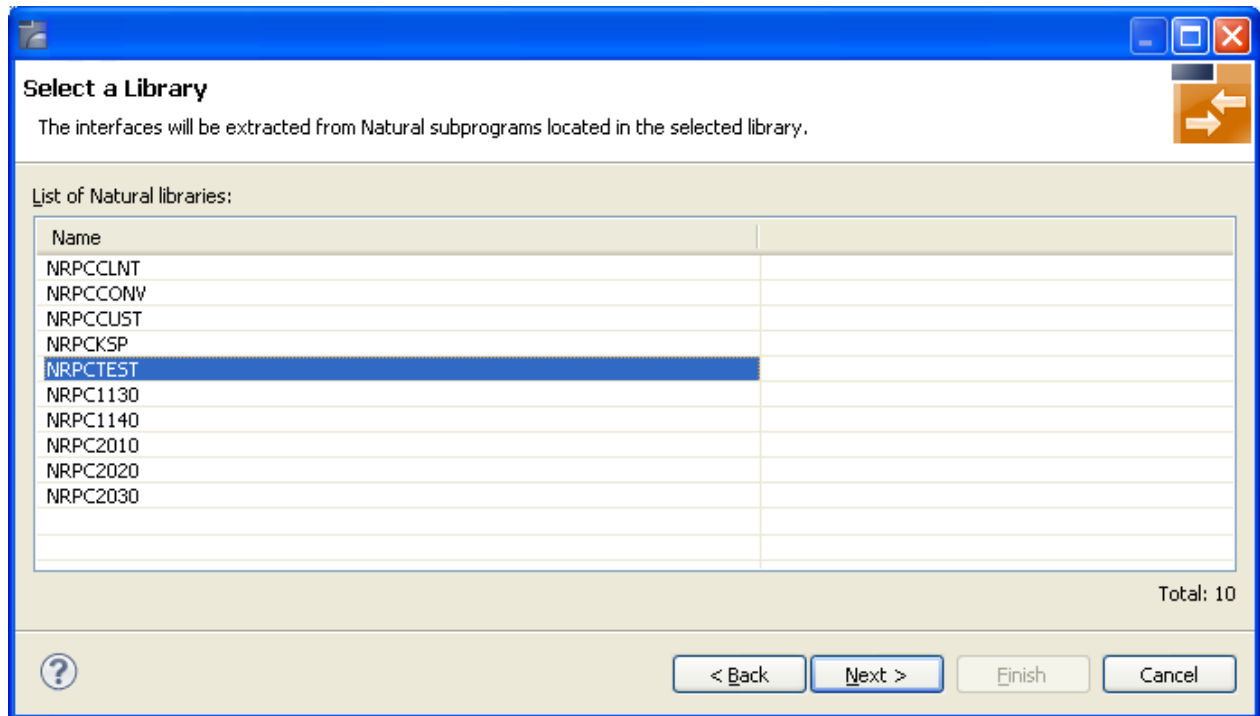
Any Natural RPC Server can be used. Only Natural libraries that reside in the FUSER system file of the Natural RPC Server can be accessed. Special configuration is required only for operating system IBM i; see *Natural RPC Server Configuration for the IDL Extractor for Natural*.

Press **Next** to continue.

- If **Library Name** (using any wildcards) matches one Natural library only, continue with *Step 5: Select Natural Subprograms from RPC Environment*.
- If **Library Name** matches more than one Natural library, continue with *Step 4: Select Natural Library from RPC Environment (Optional)*.

Step 4: Select Natural Library from RPC Environment (Optional)

All Natural libraries that reside in the FUSER system file of the Natural RPC Server and that match the specification in the **Extractor Settings** are listed here. See *Step 3: Edit RPC Environment*. This step is skipped if exactly one Natural library matches the specification. In this case continue with *Step 5: Select Natural Subprograms from RPC Environment*.

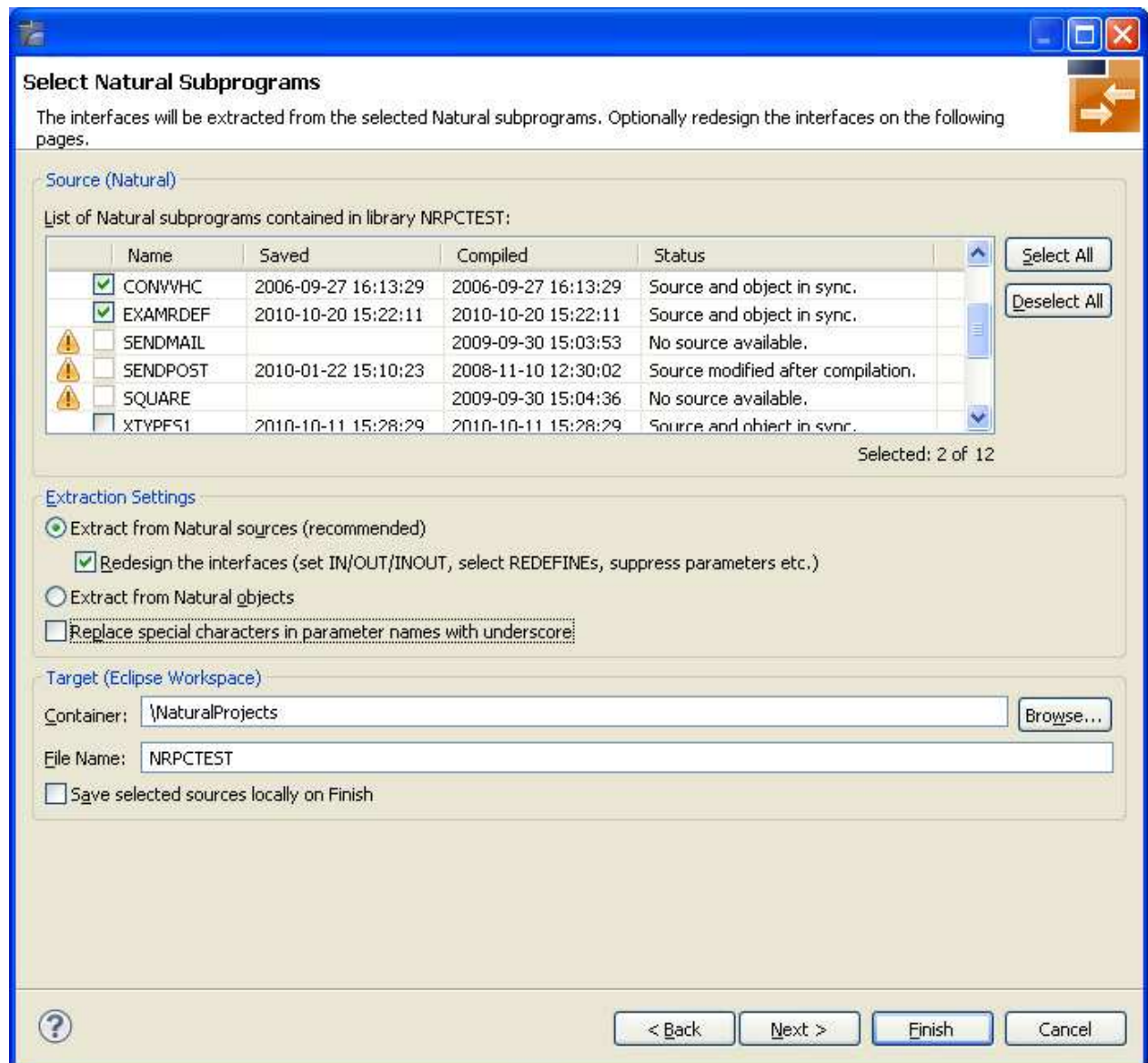


Only Natural libraries from the Natural User System file (*FUSER*) are displayed. If the Natural RPC server operates under Natural Security, Natural libraries are displayed only if you are allowed to access the library. This means that if a library is people-protected and you do not have access rights, it is not displayed. See also **RPC Server Authentication** under *Step 3: Edit RPC Environment*.

Select the Natural library from the list and choose **Next** to continue with *Step 5: Select Natural Subprograms from RPC Environment*.

Step 5: Select Natural Subprograms from RPC Environment

All Natural subprograms that match the specification in the Extractor Settings are listed here. See *Step 3: Edit RPC Environment*.



In the **Source** pane select at least one program from the list of Natural subprograms (CALLNATs). You can also choose **Select All** or **Deselect All**.

In the **Extraction Settings** pane, specify whether the IDL is to be extracted from Natural subprogram sources or compiled objects. The following restrictions apply:

- **Extract from Natural sources (recommended)**
Extracting from a source is only possible if the compiled object and source are in sync. For example, in the screen above, source extraction is not possible for
 - SENDMAIL, because there is no source, only an object
 - SENDPOST, because the source is modified after last compilation
- **Extract from Natural objects**
Extracting from an object is always possible.

Check **Redesign the interfaces** if you want to design the extracted interfaces to the Natural subprograms. The **Next** button will be enabled. See *Redesigning the Extracted Interface*. If you do not check **Redesign the interfaces**, refer to *Natural to IDL Mapping* for default mappings.

Check **Replace special characters in parameter names with underscore** to substitute the special characters '\$', '#', '&', '@', '/' by underscores. See also *Extracting IDL Parameter Names in Natural to IDL Mapping*.

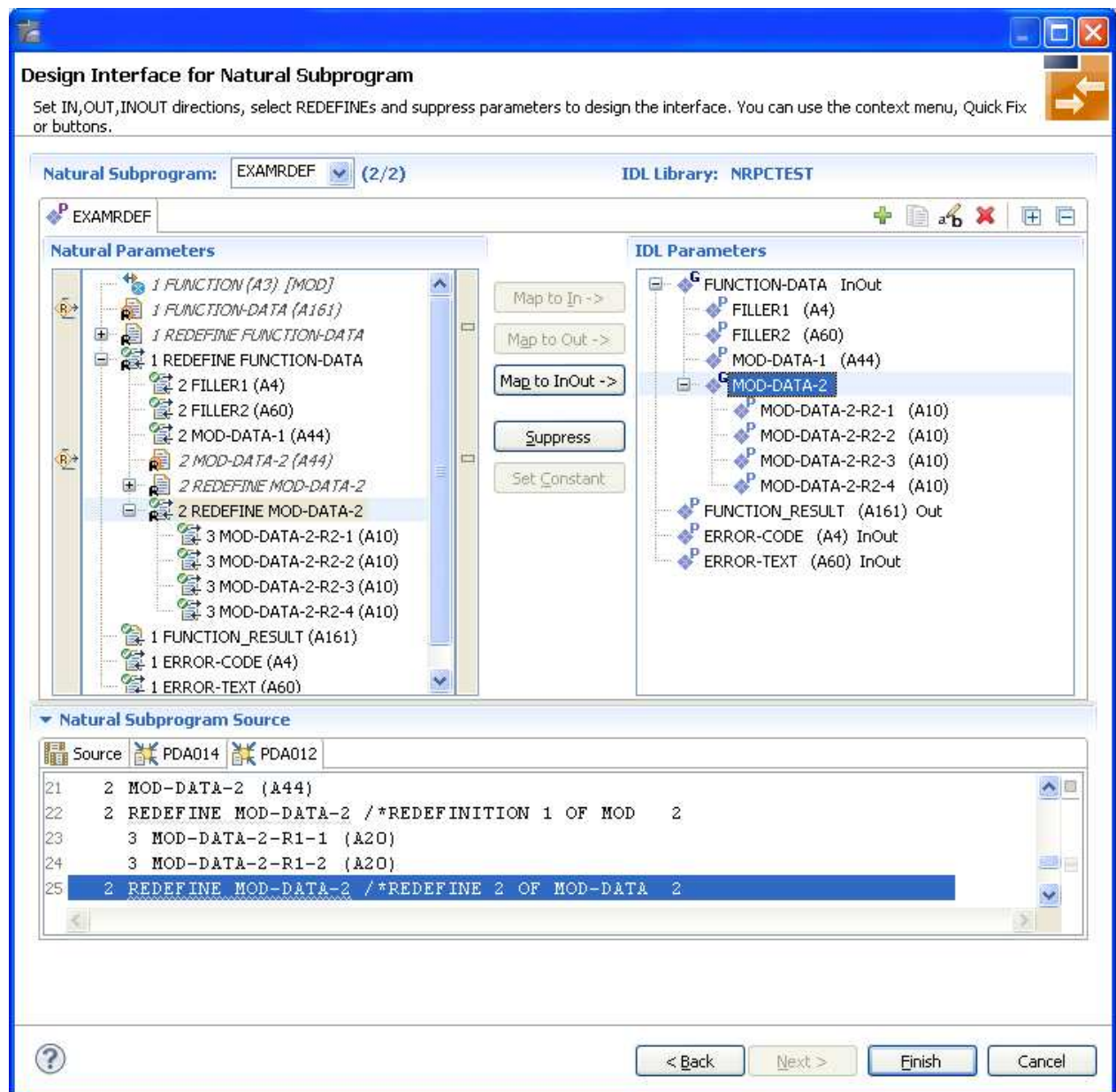
Choose **Next** to continue. If multiple Natural subprograms have been selected in the Natural subprogram selection step, redesign the next interface. You can see the current and total number of the subprogram you are extracting from in the title (n/m).

Choose **Finish** to extract the interface. For further subprograms that have been selected, a default mapping is created, see *Extraction Result*.

Step 6: Redesign the Interface for Natural Subprograms (Optional)

In this step, you can redesign the interface. This includes:

- *Extracting Multiple Interfaces*
- *Extracting Natural REDEFINES*
- *Extracting IDL Directions (IN,OUT,INOUT)*
- *Setting Natural Parameters to Constants*
- *Suppressing Natural Parameters*
- *Renaming a Program*



Use this page for the following tasks:

- Define the direction of parameters in the extracted interface. Choose **Map to In**, **Map to Out** or **Map to InOut** for each parameter on level 1.
- Define which parameters redefined in the Natural PDA are part of the extracted interface. Choose **Map to In**, **Map to Out** or **Map to InOut** for the REDEFINE base parameter or any REDEFINE path.
- Hide or suppress unneeded parameters in the extracted interface. Choose **Suppress**.
- Set parameters to constants and hide or suppress them in the extracted interface. Choose **Set Constant**.

This page consists of the following main parts:

- **Top line**







The top line contains the current Natural subprogram and the IDL library name. The combo box can be used as quick navigation if more than one Natural subprogram is selected.

- **Middle**

The middle part contains a tab item for each interface (IDL program) extracted from the Natural subprogram.

Note:

It is possible to extract more than one interface (IDL program) from a Natural subprogram. To create, rename and remove interfaces, use the toolbar on the right side of tab folder.

Icon	Function	Description
	Create	Creates a new interface (IDL program) based on the original parameters of the Natural subprogram.
	Duplicate	Creates a new interface (IDL program) based on the current interface (active tab). All modifications of the current interface are copied.
	Rename	Change the name of the current interface (active tab). The name must be unique.
	Remove	Removes the current interface (active tab). At least one interface must exist.
	Expand All	Expands the Natural and IDL tree.
	Collapse All	Collapse the Natural and IDL tree.

- **Middle left**

Input pane. The parameters of the Natural subprogram to extract from. For each Natural subprogram parameter you can choose one of the operations **Map to In**, **Map to Out**, **Map to InOut**, **Suppress** and **Set Constant**. Additionally for REDEFINES, a quick fix is available (icons on the left side of the pane) to choose which parameters redefined in the Natural PDA are part of the extracted interface.

Notes:

1. The mapping operations **Map to In**, **Map to Out**, **Map to InOut**, **Suppress** and **Set Constant** are also available in the context menu of the Natural parameter tree.
2. Natural parameters that are suppressed or set to constant in the interface are rendered in italic type. For example, in the screen above, *FUNCTION (A3)* is set to constant; *FILLER1 (A4)* and *FILLER2 (A60)* are suppressed; *FUNCTION-DATA (A161)* and its first REDEFINE path are implicitly suppressed because the second REDEFINE path with prefix *MOD-DATA-2-R2* is selected.
3. The value for Natural parameters set to constant are displayed behind the parameter in the Natural parameter tree (e.g. in the screen above, *FUNCTION (A3) [MOD]*).
4. Natural parameters mapped in the interface are displayed with a green tick (☑).

- **Middle right**
Output pane. The extracted interface (IDL).
- **Bottom**
Reference. The Natural subprogram source and its PDA sources, each displayed in a separate tab.

Tips:

- The panes can be resized.
- To enlarge parameter lists, use the vertical bars on the side.
- You can close the bottom pane if it is not needed by clicking on the triangle next to **Natural Subprogram Source**. In this way, you have more space for viewing the upper panes.

Use the quick navigation or choose **Next** to continue. If multiple Natural subprograms have been selected in the Natural subprogram selection step, redesign the next interface. The amount of subprograms extracted so far is indicated by the fraction next to the title (current/total).

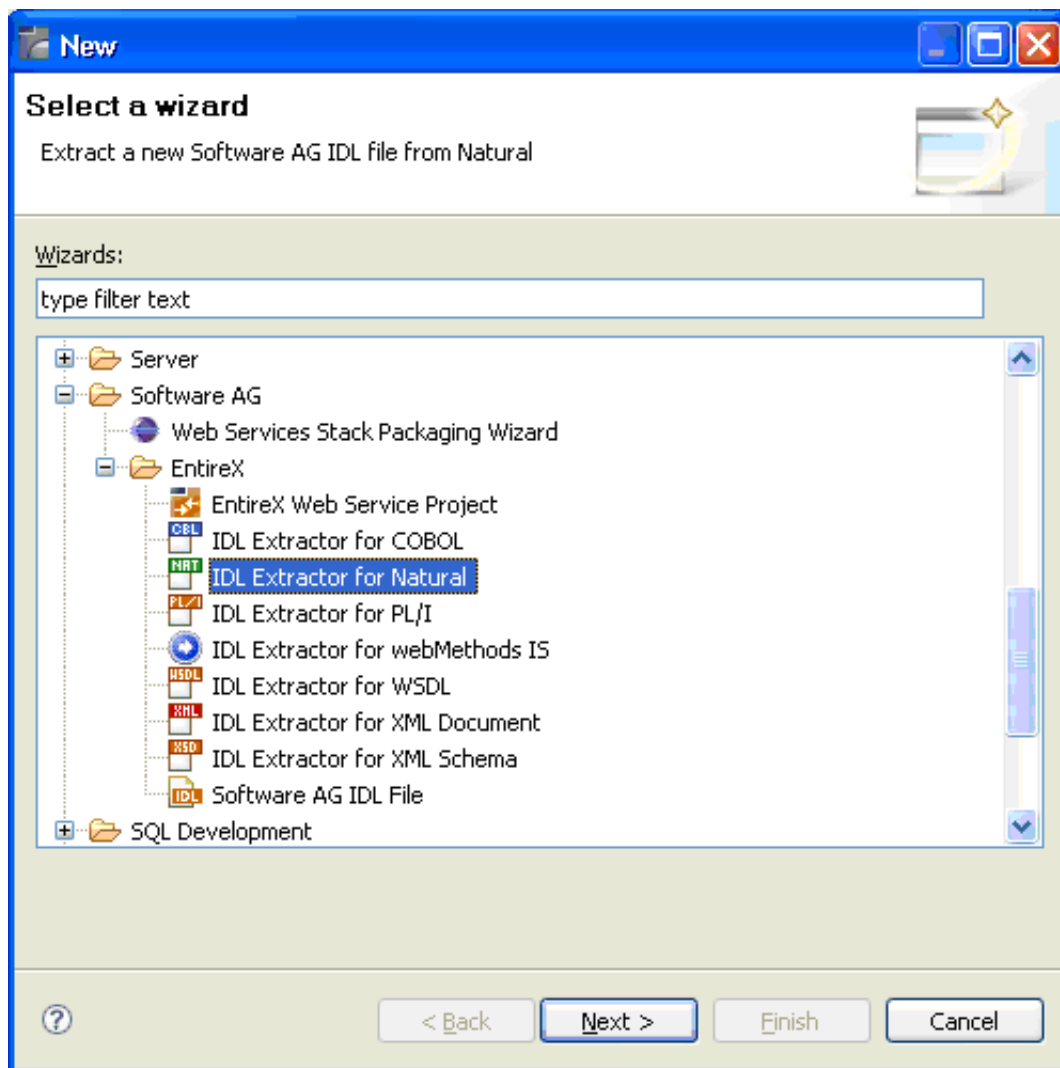
Choose **Next** to continue. If multiple Natural subprograms have been selected in the Natural subprogram selection step, redesign the next interface. You can see the current and total number of the subprogram you are extracting from in the title (n/m).

Choose **Finish** to extract the interface. For further subprograms that have been selected, a default mapping is created, see *Extraction Result*.

Extracting Software AG IDL File from an Existing Natural RPC Environment

- Step 1: Start the IDL Extractor for Natural Wizard
- Step 2: Select an RPC Environment

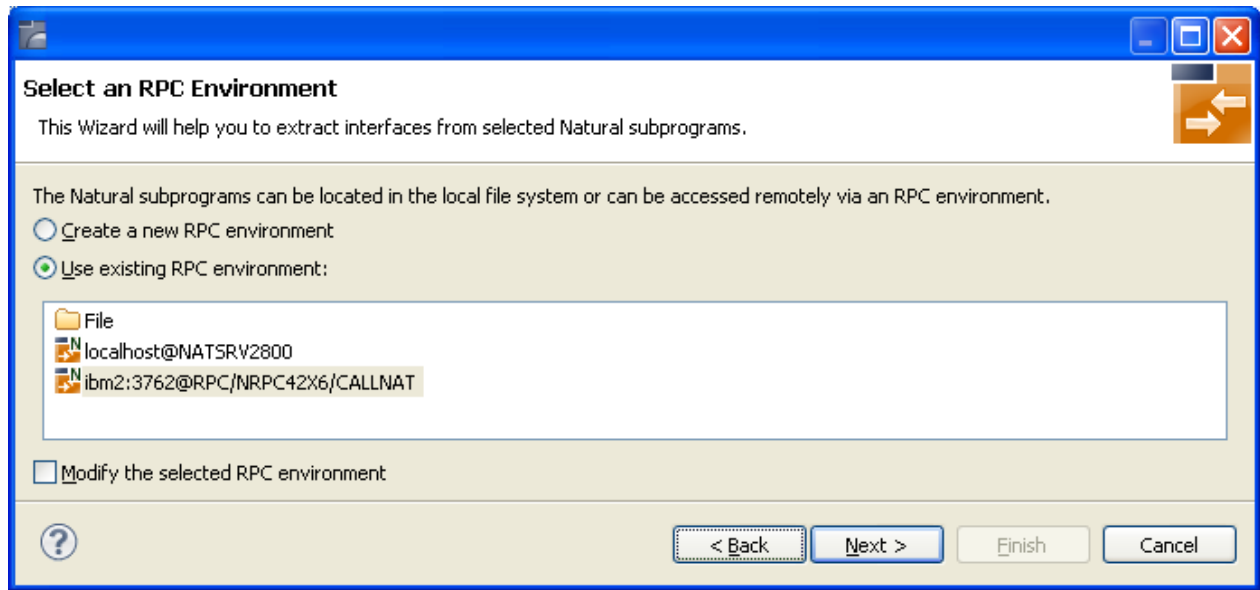
Step 1: Start the IDL Extractor for Natural Wizard



Choose Next and continue with *Step 6: Redesign the Interface for Natural Subprograms (Optional)*.

Step 2: Select an RPC Environment

If RPC environments are defined, you can select an existing one. RPC environments are managed in the *Preferences*.



Select **Use existing RPC environment** and select the appropriate RPC environment from the list below.

If **Modify the selected RPC environment** is checked, the selected RPC environment can be modified before extraction starts.

Press **Next** to continue.

- If **Modify the selected RPC environment** is *checked*, continue with *Step 3: Edit RPC Environment* above.
- If **Modify the selected RPC environment** is *not checked* and the Natural library name matches *one* Natural library only (using any wildcard defined in *Step 3: Edit RPC Environment*), continue with *Step 5: Select Natural Subprograms from RPC Environment* above.
- If **Modify the selected RPC environment** is *not checked* and the Natural library name matches *more than one* Natural library, continue with *Step 4: Select Natural Library from RPC Environment (Optional)* above.

Note:

The folder **File** and the RPC environment **localhost@NATSRV2800** (default RPC server for NaturalONE) are available only if NaturalONE plug-ins are installed.

Extraction Result

When the wizard has finished successfully, you can see two additional files in your Eclipse project:

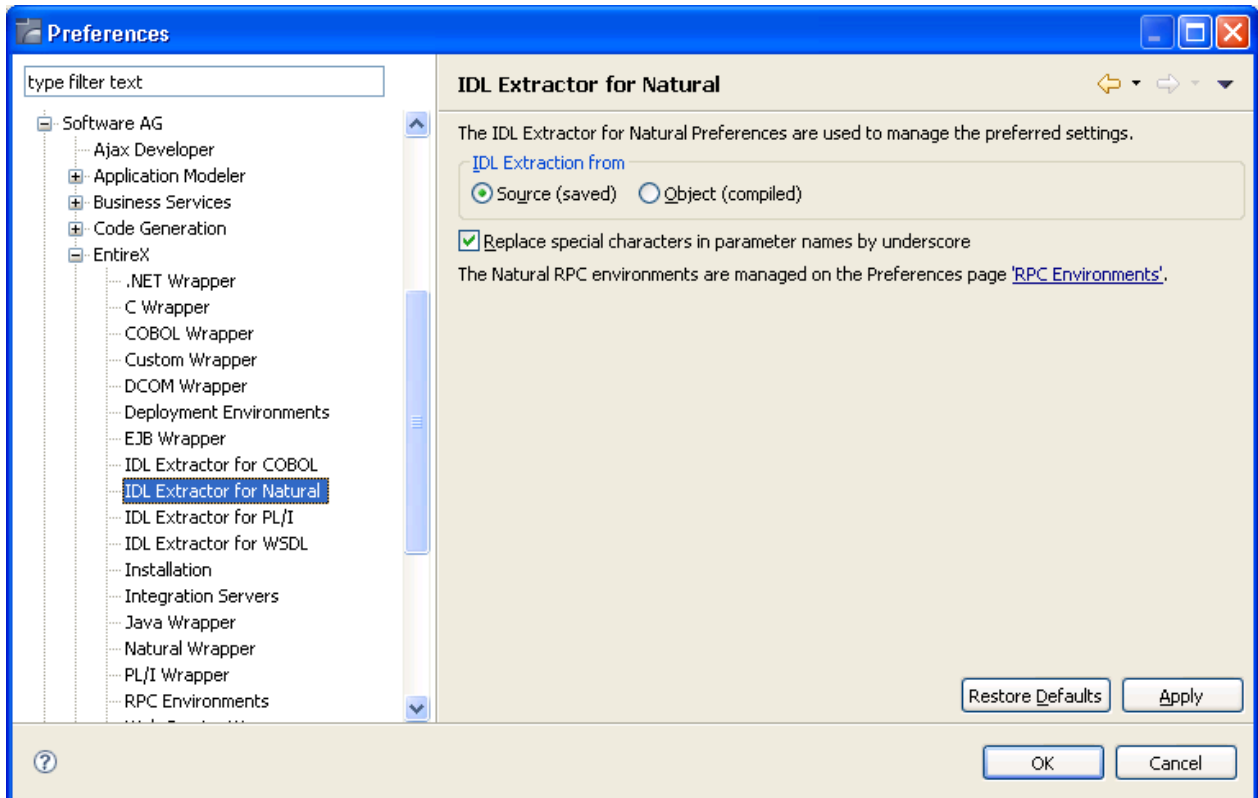
- **.idl file**
The IDL file that describes the RPC interface of the Natural server component that implements the service's business logic. The IDL file is opened with the IDL Editor. See *Software AG IDL File* in the IDL Editor documentation.
- **.cvm file (optional)**
This server mapping file completes the IDL file with a mapping from the programming-language-neutral parameter definition in the IDL file to the parameters and data types

expected by the Natural subprograms (CALLNATs). Always keep the server mapping in the same folder as its related IDL file. See *Server Mapping Files for Natural* in the EntireX Workbench documentation.

For more information on how Natural programs are extracted, refer to *Natural to IDL Mapping*.

Preferences

Use the preference page for IDL Extractor for Natural to manage the default values for the IDL Extractor for Natural wizard.



The option **IDL Extraction from Source** or **from Object** determines from which code type the IDL file is to be extracted.

With the check box **Replace special characters in parameter names with underscore**, the special characters ("\$", "#", "&", "@", "/") allowed in Natural parameters can be replaced by underscores. See also *Rules for Coding Group and Parameter Names*.

For more information on object and source extraction and character replacing, see *Step 5: Select Natural Subprograms from RPC Environment*.

RPC environments are managed with the *RPC Environment Manager*.