Natural Business Rule Automation: Concepts and Facilities

Version 1.1

November 2016

ADABAS·NATURAL

This document applies to Natural Business Rule Automation Version 1.1 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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About this Guide

This guide describes the technical features and architecture of Natural Business Rule Automation.

The product Natural Business Rule Automation provides extensive functionality on businesses rules and process flow automation, allowing flexibility to attend business demands.

Online Information

Software AG Documentation Website

You can find documentation on the Software AG Documentation website at http://documentation.softwareag.com. The site requires Empower credentials. If you do not have Empower credentials, you must use the TECHcommunity website.

Software AG Empower Product Support Website

You can find product information on the Software AG Empower Product Support website at https://empower.softwareag.com.

To submit feature/enhancement requests, get information about product availability, and download products, go to Products.

To get information about fixes and to read early warnings, technical papers, and knowledge base articles, go to the Knowledge Center.

Software AG TECHcommunity

You can find documentation and other technical information on the Software AG TECHcommunity website at http://techcommunity.softwareag.com. You can:

- Access product documentation, if you have TECHcommunity credentials. If you do not, you will need to register and specify "Documentation" as an area of interest.
- Access articles, code samples, demos, and tutorials.
- Use the online discussion forums, moderated by Software AG professionals, to ask questions, discuss best practices, and learn how other customers are using Software AG technology.
- Link to external websites that discuss open standards and web technology.

1 Introduction

Natural Business Rule Automation is Software AG's solution for exploring and maximizing the great value of Natural applications by extending its usage to the business process management platform. This allows Adabas and Natural customers to develop, run, and monitor new automated processes involving heterogeneous technologies, systems, human interaction, rules, and contents. The benefits of this are:

- Quick development of new web process applications for internal and external users consuming services and automated rules.
- Automation, exposure, and rules management for consumption by systems and applications.
- Task management for users participating in automated processes.
- Automation of technical processes involving triggering of services and internal/ external back-end systems.

Natural Business Rule Automation can be used for automation of business rules and process flow that allows, with no coding needs, to define and build codes integrated into existing functions in Natural programs, and to implement the business logic that drives the process and may also trigger events and actions in specific scenarios. The solution can also externalize the business rules from Natural applications, allowing to make changes in flows of business by users during process execution – without reconstruction and deployment.

Natural Business Rule Automation also enables end-to-end control and visibility of processes modeled – with no coding needs – and orchestration as business dynamic to integrate users through web and mobile interfaces with Natural services, systems, functionality, programs and transactions.

These capabilities provide great flexibility and reduce development effort, which allows quickness in building solutions to meet business demands.

2 Key Characteristics

One of the greatest difficulties of a company is to meet the business demands in a given time frame.

Natural Business Rule Automation gives you a better ability to automate business rules and process flows in a more modern concept, allowing to meet the demands of business in time. It also provides great flexibility and control of processes end-to-end, and allows dynamic orchestration to integrate the users with services, functions or applications.

In this context, Natural Business Rule Automation offers unique features:

- Visual business rules construction based on tables or decision trees.
- Native and automatic integration with Natural programs and transaction interfaces.
- Componentization and rules exposure as services for consumption by automated processes, applications or other services.
- Visual construction for automated process flows, including:
  - User interfaces for web and mobile construction.
  - Drive Natural programs and functions.
  - Drive automated rules and services.
  - Debug tool for processes.
  - Simplified configuration of SLAs and Key Performance Indicators (KPIs).
  - Automated deployment for processes, rules and components into test, approval and production environments.
  - Control on all assets related to processes and automated rules (services, rule sets, decision tables, decision trees, interfaces, Natural programs, web forms, etc.).
  - Graphical change impact analysis on existing components.
- User interface portal containing task list, inbox, dashboards, detailed process instances, and performance analysis of each instance and process as a whole.
- Collaboration functionality between users on task execution.
- Avoidance of manual error and delegation of tasks between people.
- Rules governing the setting and change processes.
- Quick process change with no application change.
- Execution of orchestrated processes and end-to-end visibility.
- Insights into real-time business activities.
- Key Performance Indicators analysis.

- Problems and exceptions discovery.

Benefits

- **IT cost**

  Reduce development effort, allowing quick solution delivery to meet business demands.

- **Operational efficiency**

  Provide continuous improvements of business rules and process automation. Great flexibility by orchestrating users, systems and rules.

- **Process monitoring**

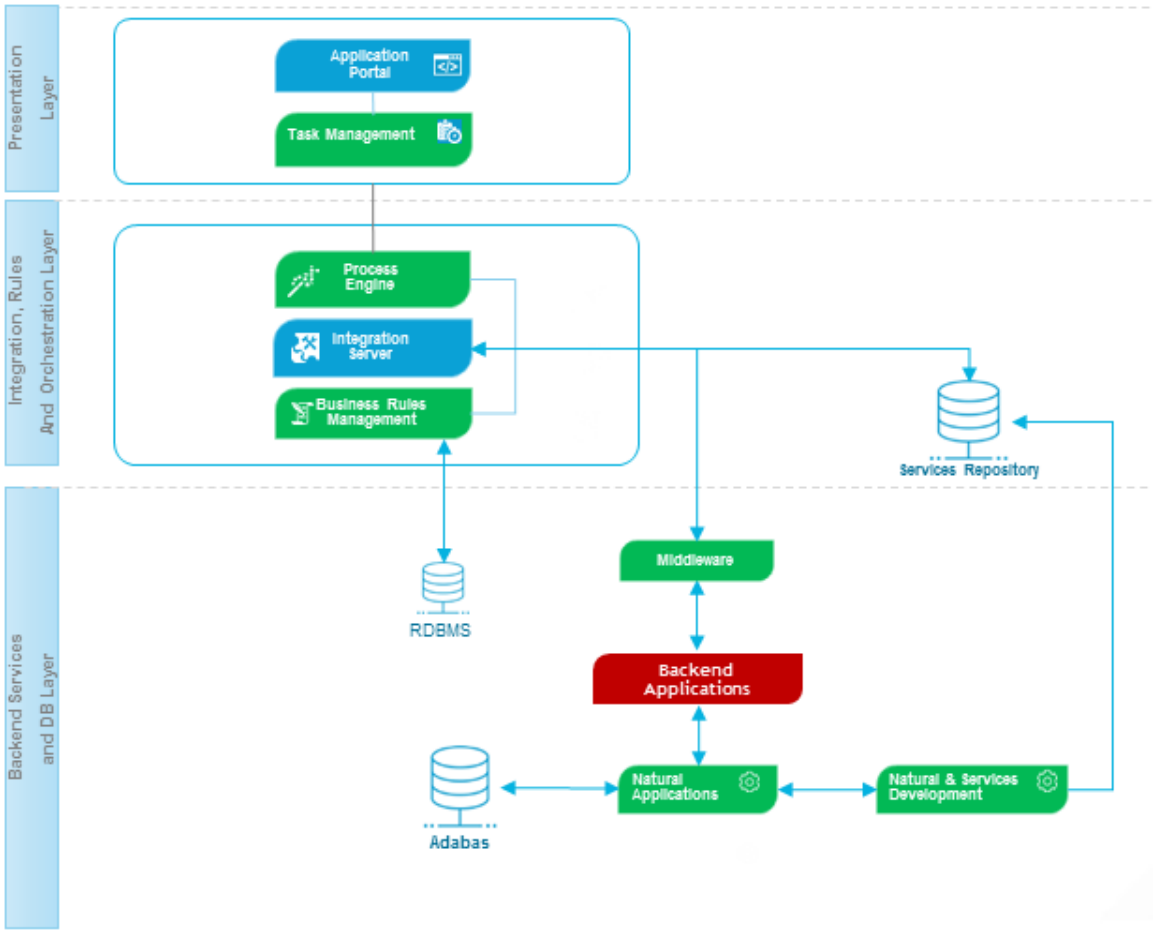
  Enable to monitor processes, KPIs, and SLA in real time, and also ability of fault identification and corrective actions.

3 Architecture and Capabilities

- Solution Layers 12
- Solution Capabilities 13

The following sections describe the capabilities and layers of the solution.

Solution Layers



The above figure describes the roles of the individual elements in the layers that involve the solution. The following is a summary of each layer:

- **Backend Services and Database Layer**

  The solution has comprehensive and integrated tools that allow you to expose Natural legacy applications business rules in a very easy and quick way using a graphical interface. This reduces error-prone manual tasks and also allows for code testing and debugging. The Natural applications can be hosted on mainframe or Linux, UNIX and Windows (LUW) platforms.

- **Integration, Rules and Orchestration Layer**

  This layer provides the ability to develop process flows using the available assets (web services) and to integrate heterogeneous technologies. It provides all the capabilities needed to quickly create or change dynamic business applications, enabling end-to end control and visibility of the modeled process and orchestration.

This layer also includes the following:

- **Web Service Repository Component**

  The solution provides a repository and allows management of assets (web services). This helps enterprises to securely expose Natural web services, and developers can thus easily create new web, mobile and cloud apps. As a result, you can reach new customers, support new devices, and obtain new sources of revenue.

- **Presentation Layer**

  Presentation functionality is available to the users by using portal technology. With the presentation layer, it is possible to manage the infrastructure components and also to monitor the process (instances, tasks, status, etc.).

Solution Capabilities

Natural Business Rule Automation delivers capabilities to expose Natural rules as services for reuse allowing the design, development and orchestration of new business process in the organization. The following is a summary of the capabilities provided by the solution:

- **Adapters**

  The adapter layer provides the ability to expose and reuse Natural business rules as a service. The Natural business rules are exposed by Natural RPC servers allowing IDL (Interface Description Language) extraction from the Natural objects.

- **Presentation**

  The presentation layer provides the capability of interfacing with the users through technologies such as portals.

- **Business Process Management**

  The Business Process Management (BPM) layer offers Task Management, Process Orchestration, Rules Management and Process Monitoring. It enables you to design, model, execute, monitor and optimize business processes. Thus, existing Natural functionality can be reused in the flow of new business processes, giving agility for developers to meet business needs quickly.

- **Integration**

  The integration layer enables service adapters to integrate the process allowing the use of heterogeneous technologies. Based on the IDL provided in the adapter layer, an EntireX adapter connection is created on the Integration Server, allowing you to deploy a service based on the adapter connection.

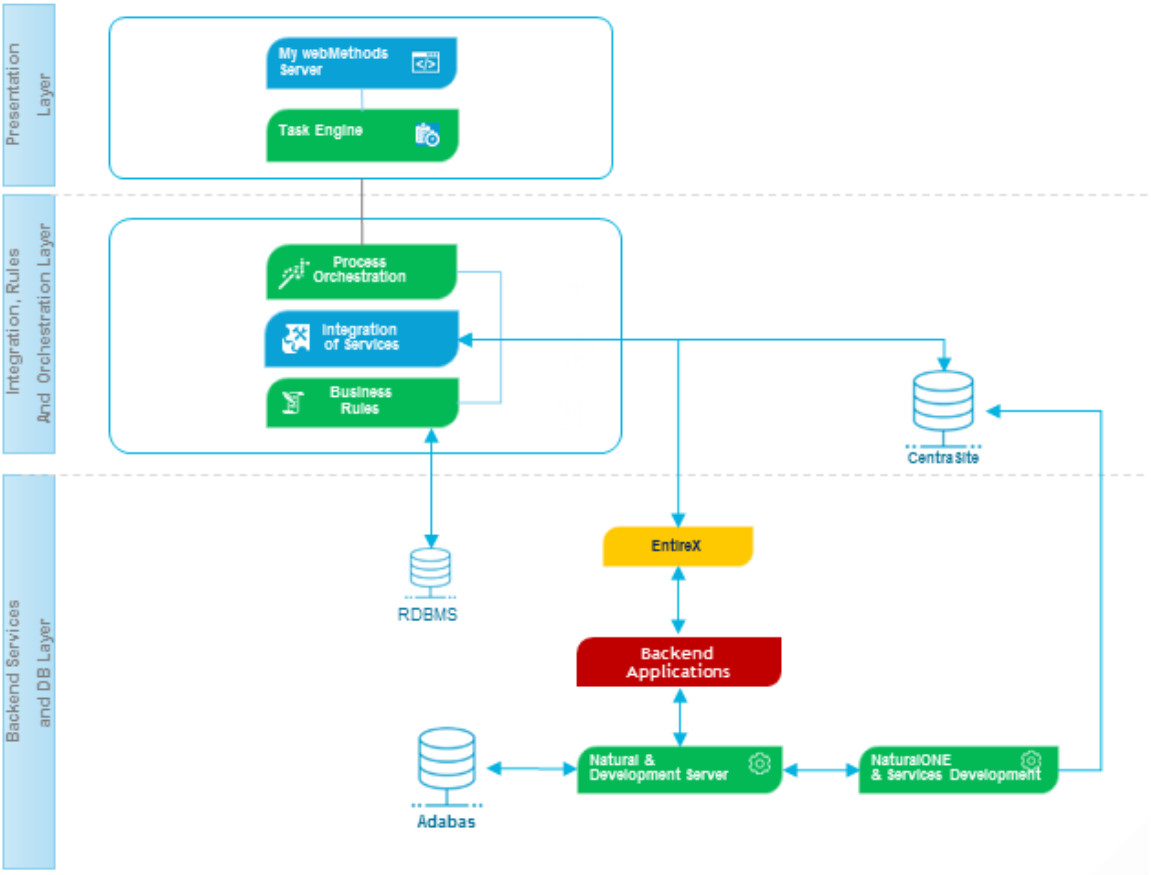
- **Web Service Repository**

  This layer provides repository and management facilities for the assets and services that are developed and deployed from your Natural applications. Based on web

services generated in the integration layer, the asset should be registered in and published to the repository (CentraSite) to be available for further consumption in new processes developed in the business management scope.

To support environments that require higher levels of availability and performance, Natural Business Rule Automation provides support for high availability cluster scenarios in some of its components (for example, in the integration layer and presentation layer).

4 Technical Components



For additional information about the technical components in the solution architecture, refer to the respective product documentation as per the table below:

Technical Capability	Implemented by Component
Application Portal	My webMethods Server
Task Management	Tasks Engine
Process Orchestration	Process Engine
Integration Server	webMethods Integration Server
Rules Management	Business Rules

Technical Capability	Implemented by Component
Middleware	webMethods EntireX [1]
Process Monitoring	Optimize for Process
Natural Server	Natural
Natural Development	NaturalONE (Software AG Designer and Natural Development Server)
Service Repository	CentraSite
Messaging Server	Universal Messaging
Adapters	Enterprise Java Beans and JDBC
Data Access Acceleration	Terracotta BigMemory Max

[1] webMethods EntireX is a prerequisite but it is not part of Natural Business Rule Automation.

5 Exposing Natural Rules as a Service

- Infrastructure 18
- Step-by-Step 18

One key element in Natural Business Rule Automation is the capability to expose Natural applications as services. It is possible to expose Natural business rules in different ways and thus to enable rules reusability to attend demands according to business requirements. The approach described below is based on the webMethods EntireX and Integration Server solutions from Software AG.

Infrastructure

The following infrastructure components are used to deploy a service from Natural code:

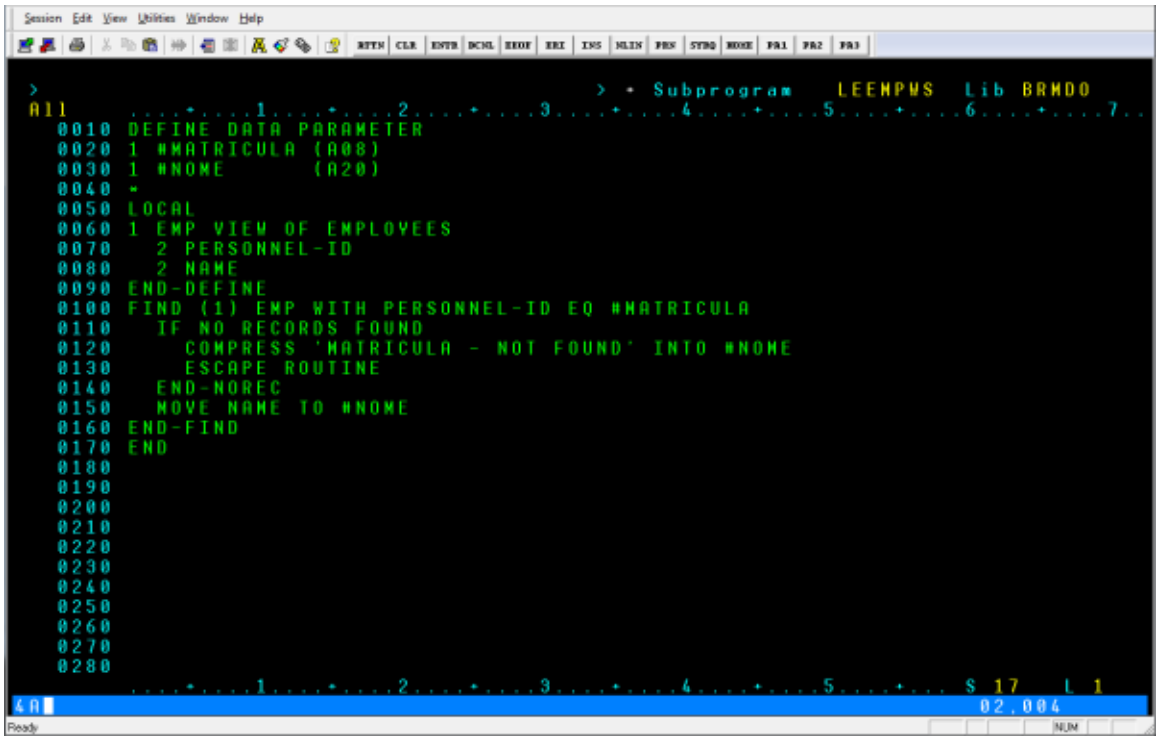
- Mainframe platform:
  - Natural
  - webMethods EntireX
  - Natural RPC Server
- Windows platform:
  - Software AG Designer – NaturalONE, EntireX Development and Service Development
  - Integration Server (with EntireX Adapter)
  - CentraSite (Service Repository)

Step-by-Step

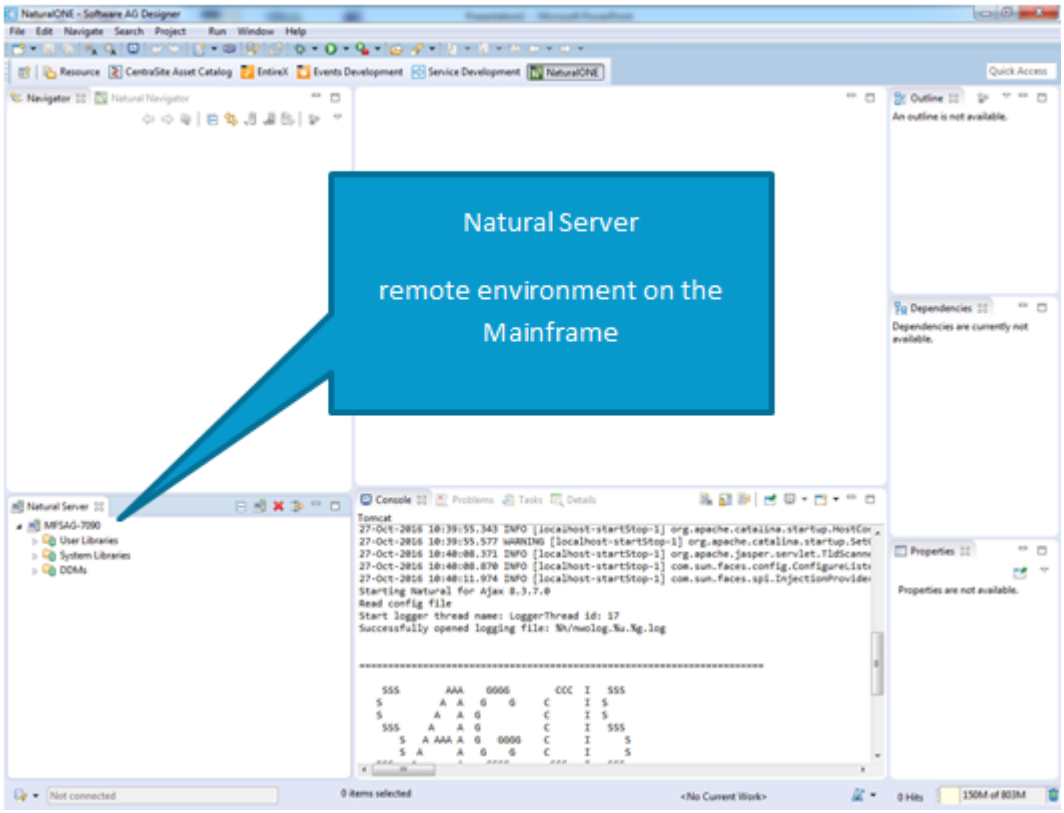
This section describes the procedure that is used to expose Natural business rules as a service and to enable the registration and governance of the deployed assets.

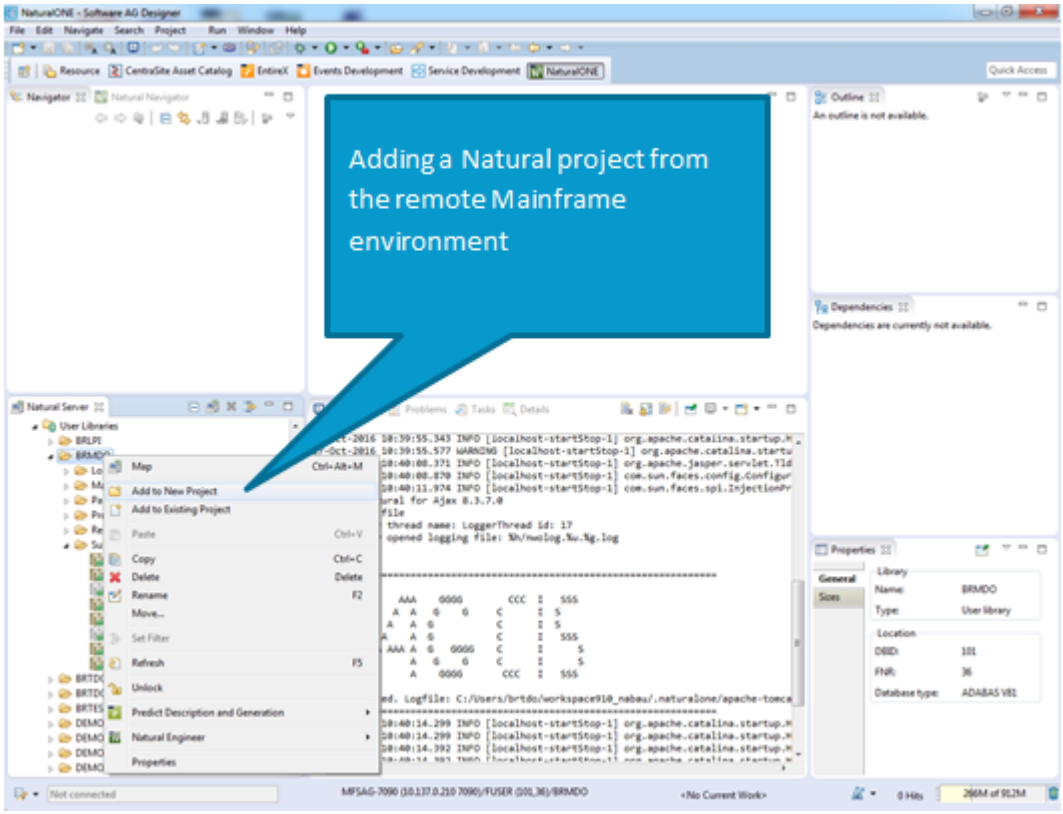
This procedure is based on Natural programs on a mainframe, but it also works for Natural on Linux, UNIX and Windows (LUW).

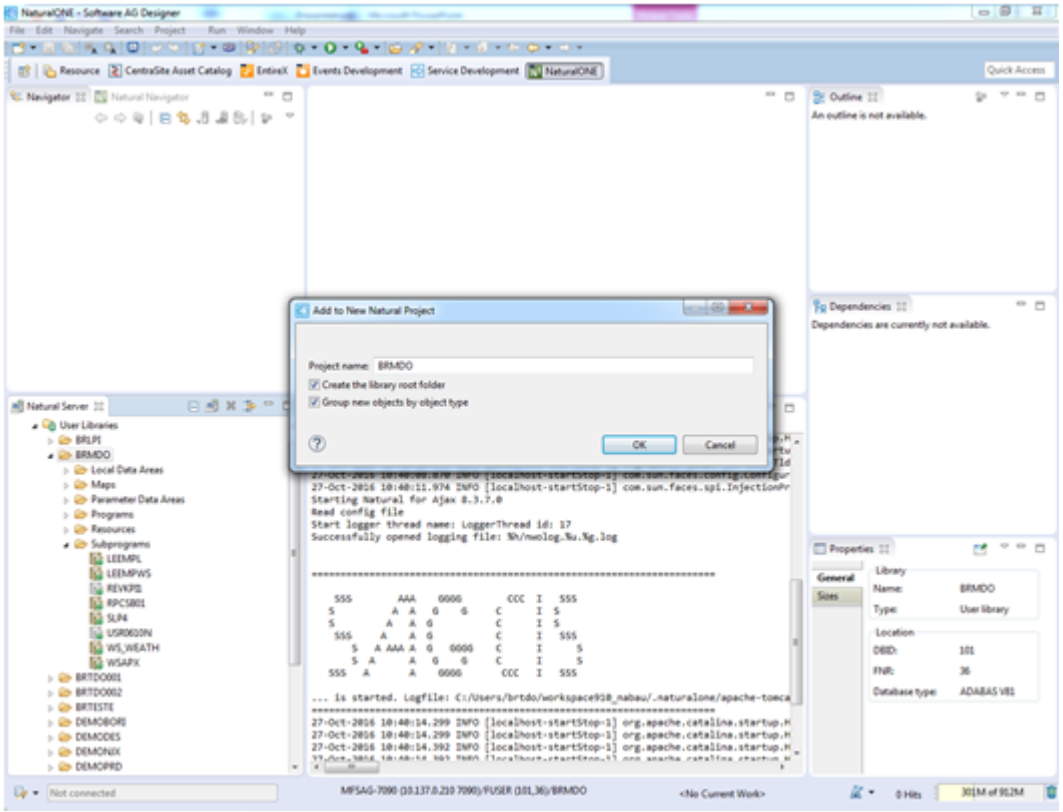
Sample Natural subprogram used to expose business rules as a service

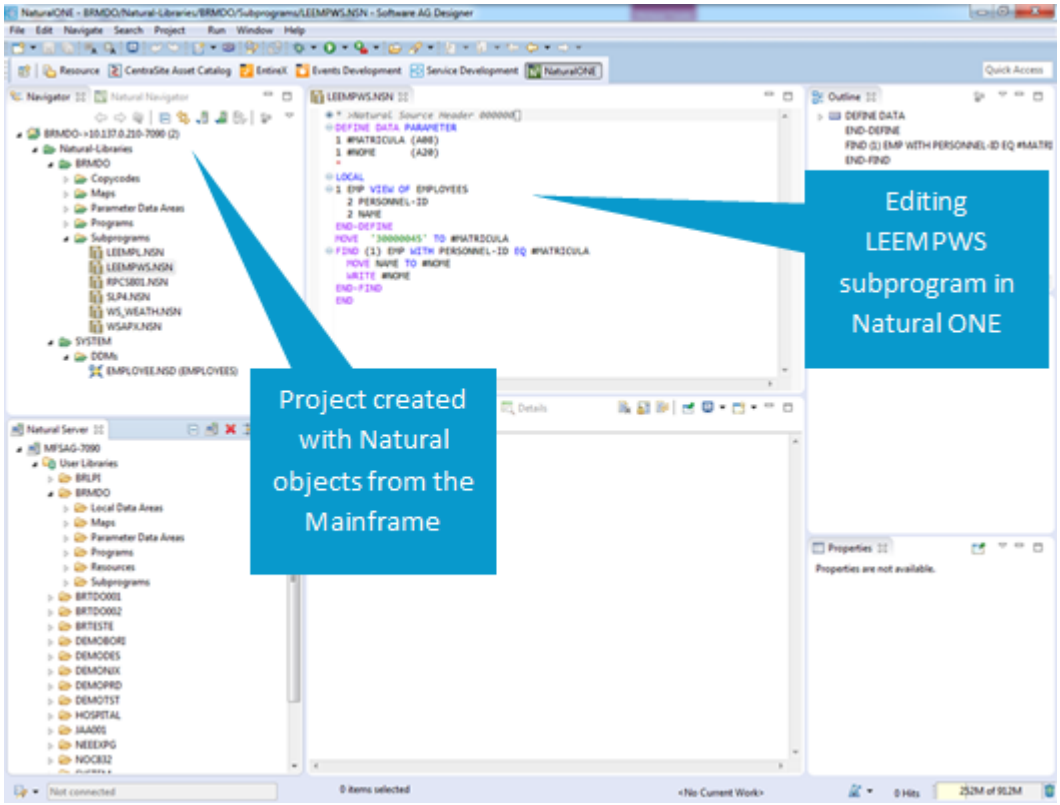


NaturalONE – Remote access to the Natural environment

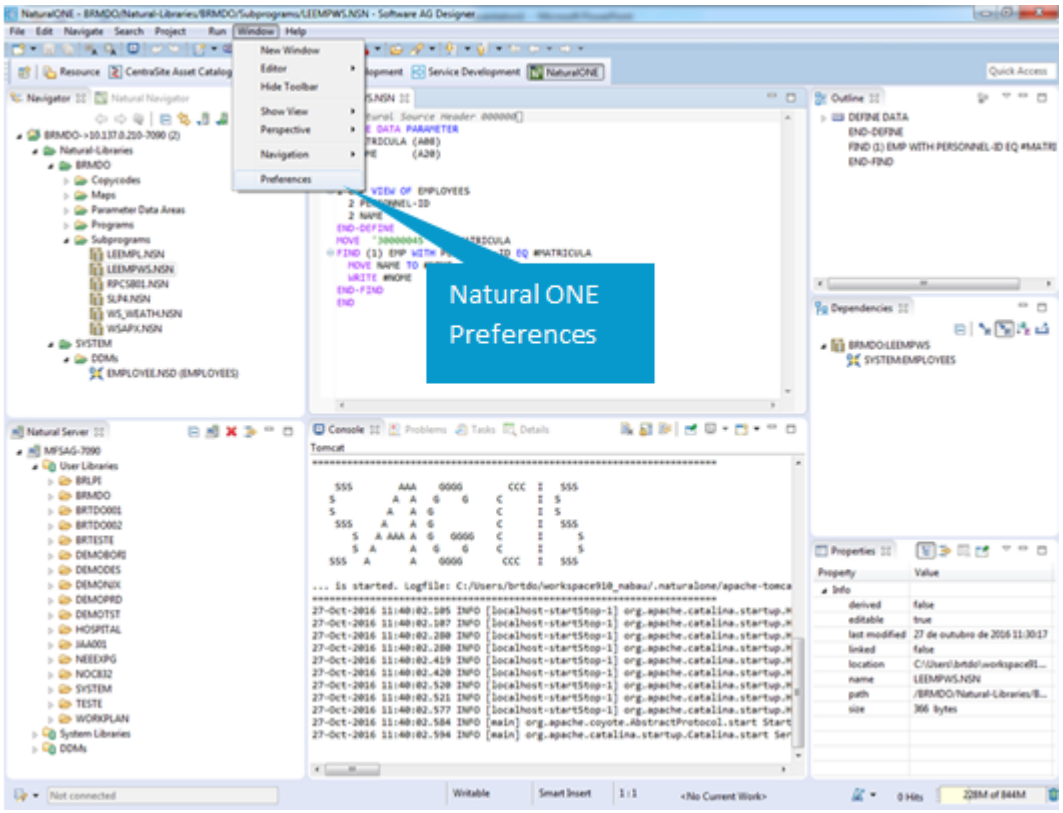


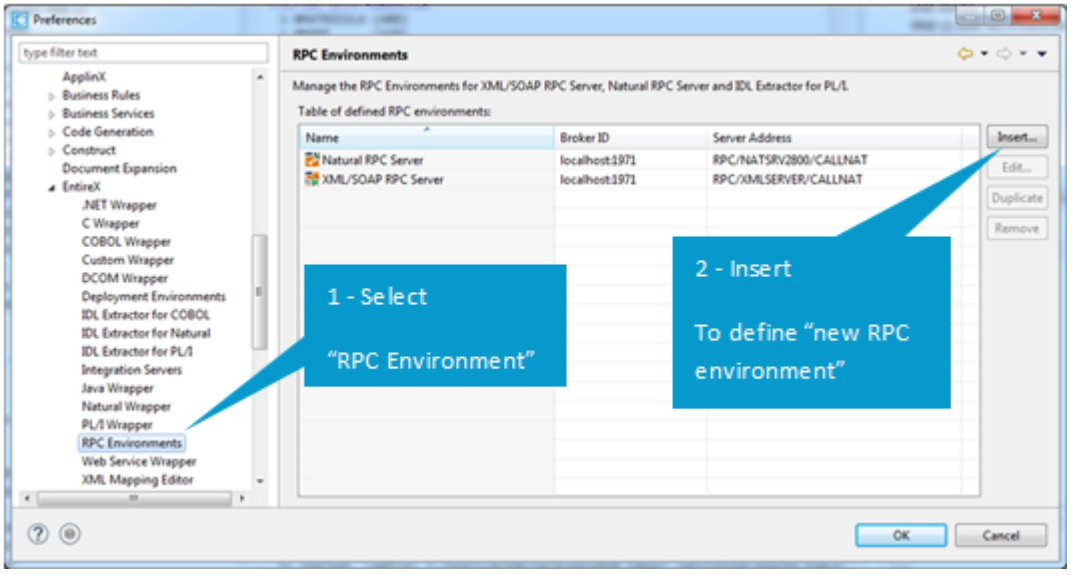

Adding a Natural project from the remote Mainframe environment
Add to New Project
Add to Existing Project

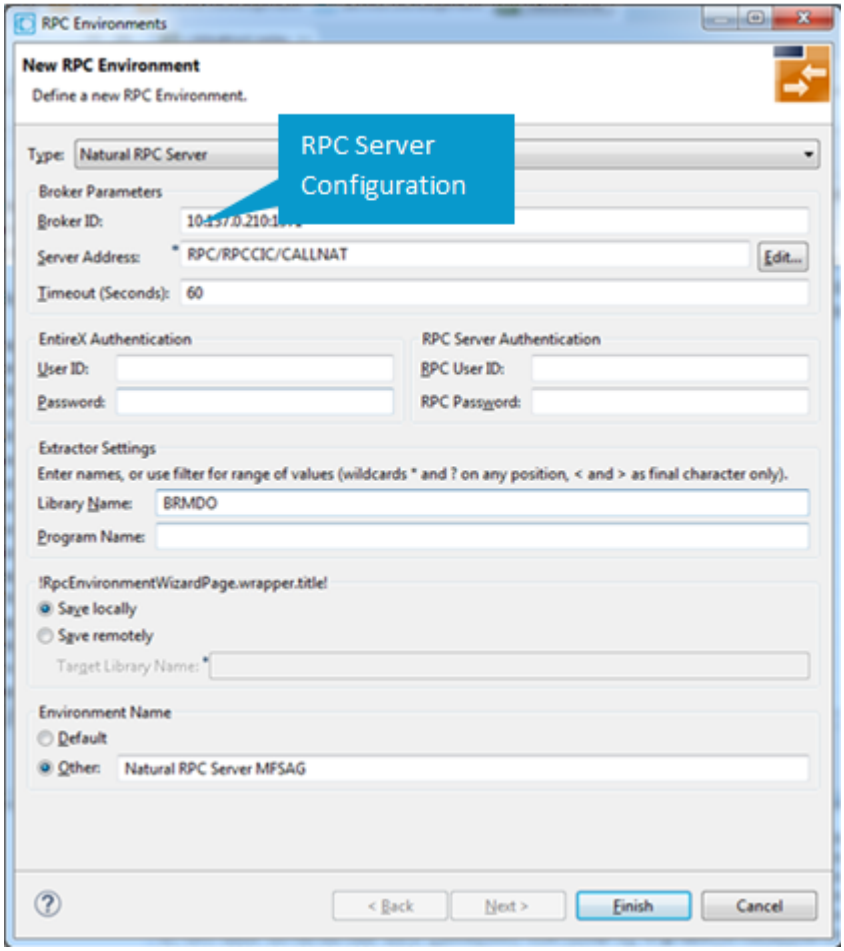

Add to New Natural Project
Project name: BRMDO
Create the library root folder
Group new objects by object type
OK
Cancel


Editing LEEMPWS subprogram in Natural ONE
Project created with Natural objects from the Mainframe

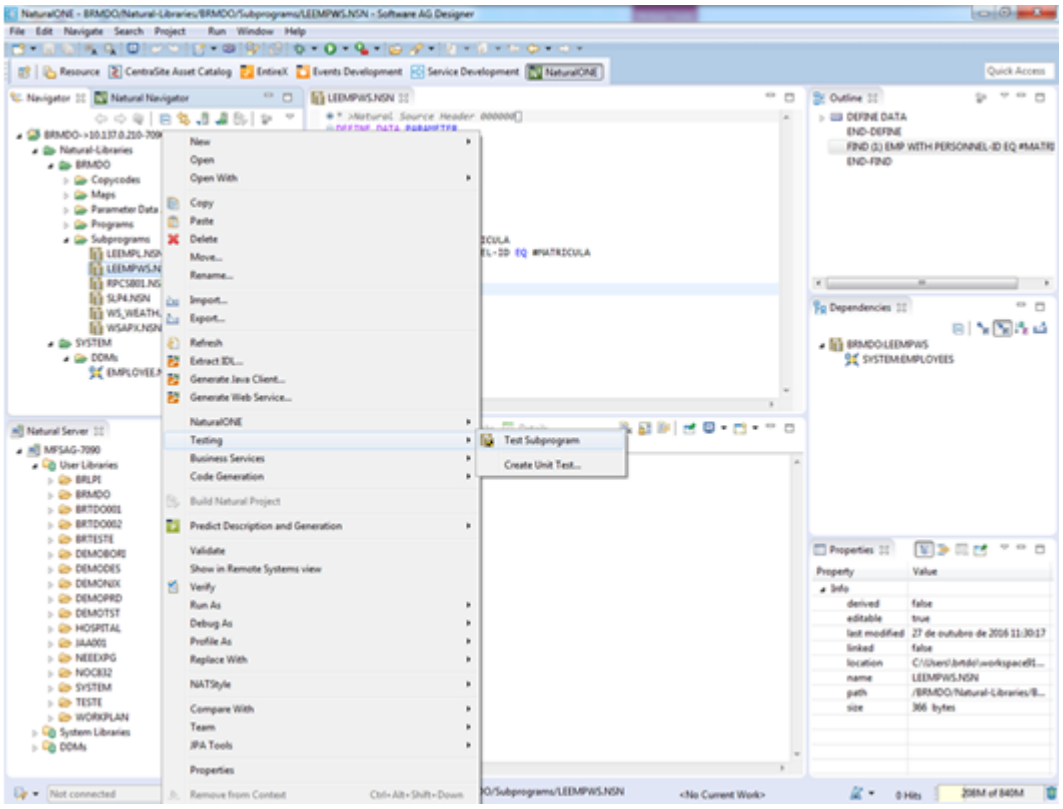
RPC customization

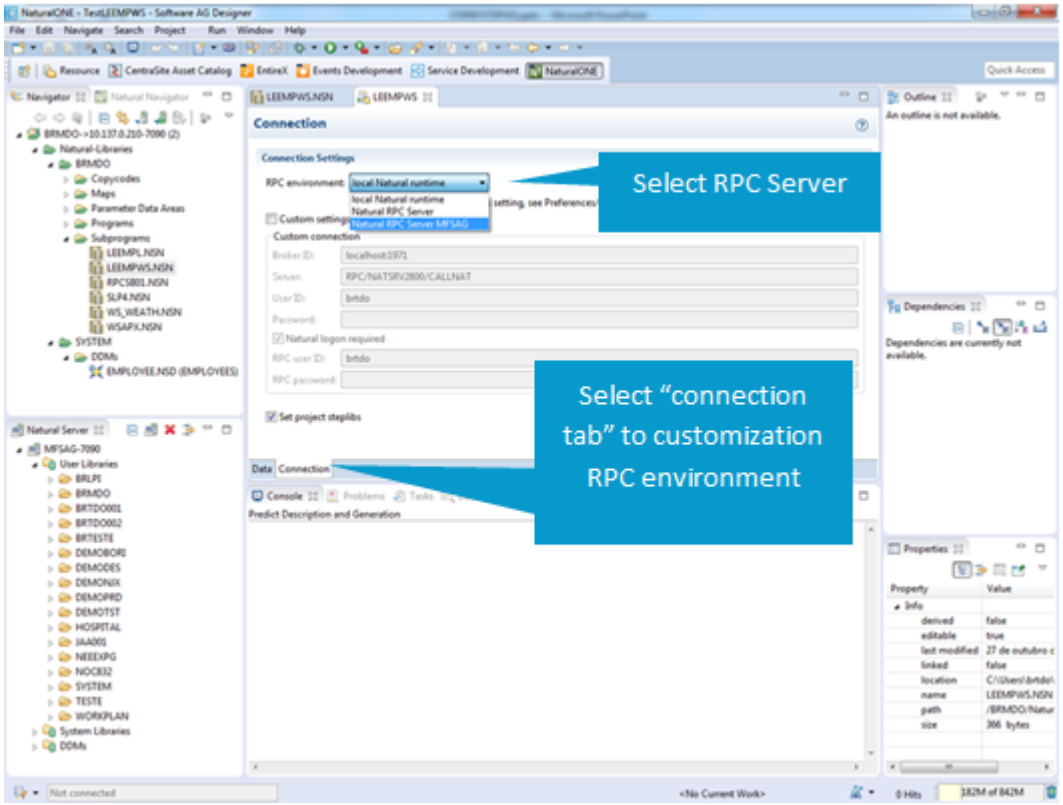


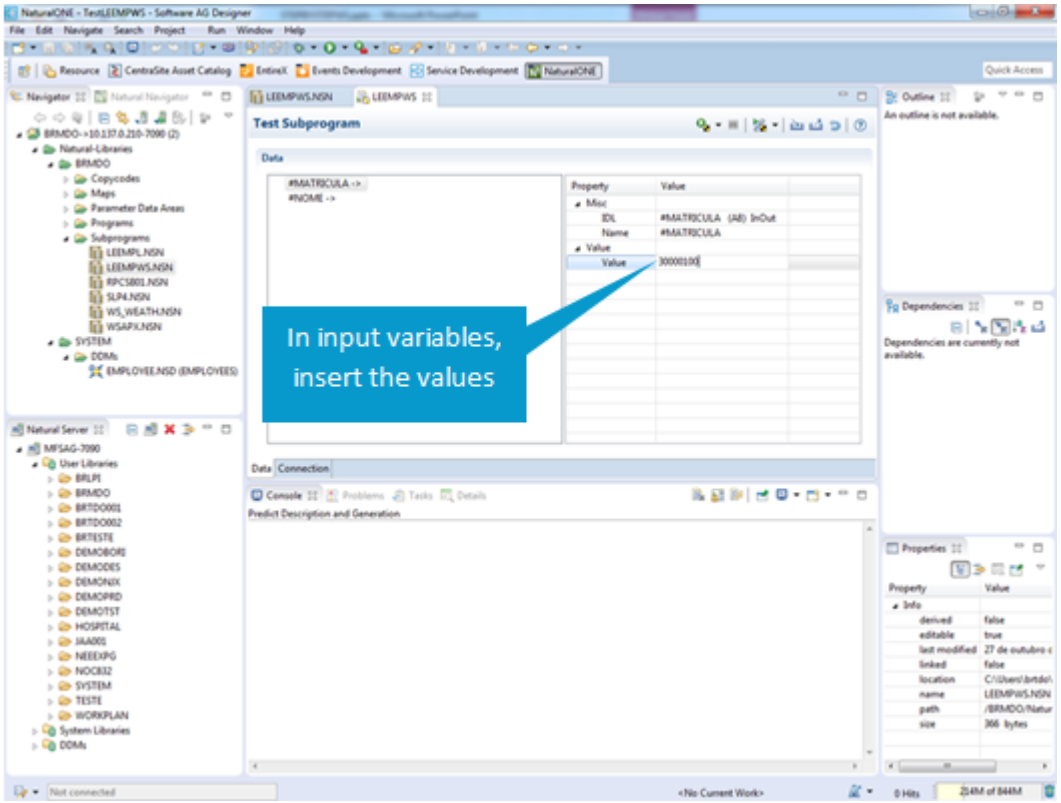


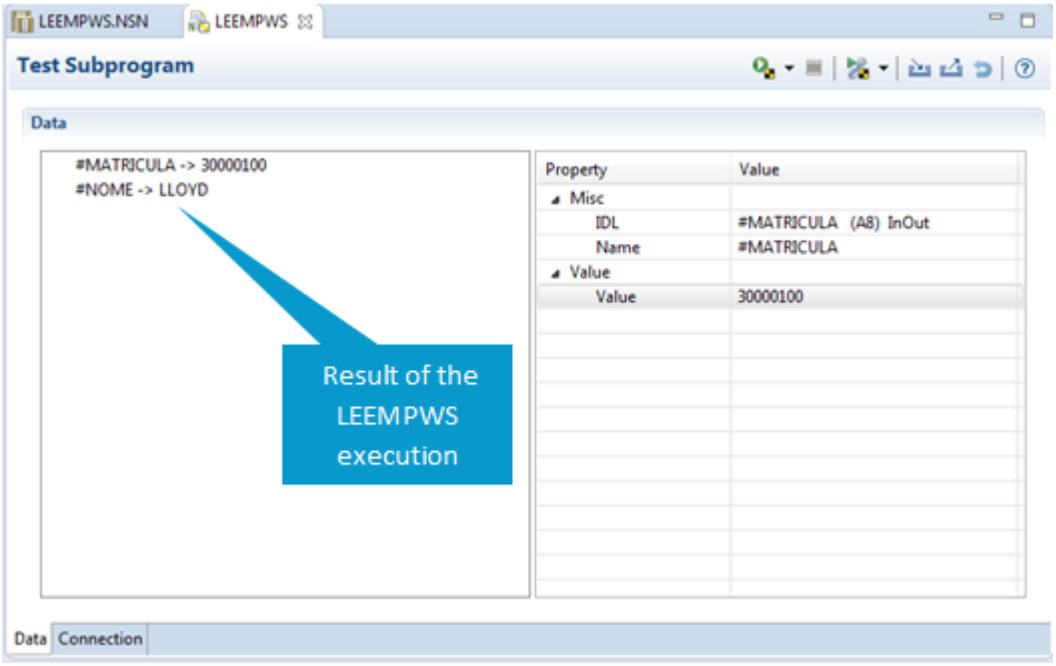

RPC Environments
New RPC Environment
Define a new RPC Environment.
RPC Server Configuration
Type: Natural RPC Server
Broker Parameters
Broker ID:
Server Address: RPC/RPCCIC/CALLNAT
Edit...
Timeout (Seconds): 60
EntireX Authentication
User ID:
Password:
RPC Server Authentication
RPC User ID:
RPC Password:
Extractor Settings
Enter names, or use filter for range of values (wildcards * and ? on any position, < and > as final character only).
Library Name: BRMDO
Program Name:
!RpcEnvironmentWizardPage.wrapper.title!
Save locally
Save remotely
Target Library Name:
Environment Name
Default
Other: Natural RPC Server MFSAG
< Back
Next >
Finish
Cancel

Testing the subprogram using the RPC server environment

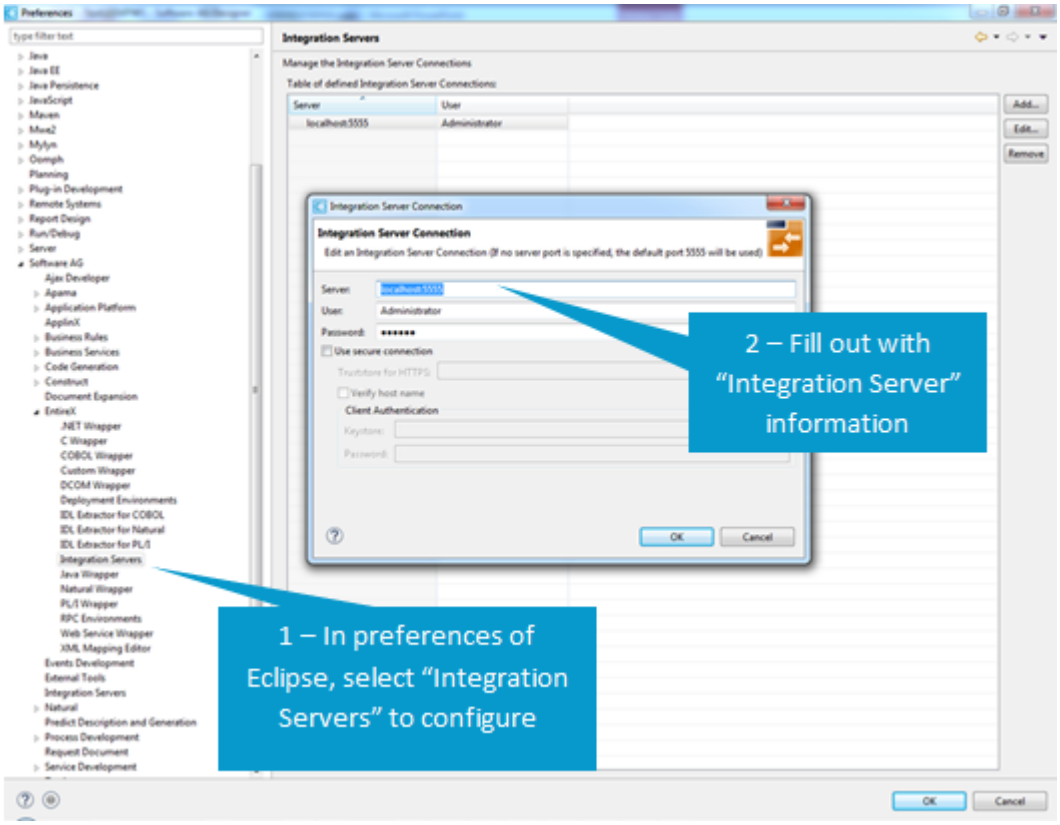


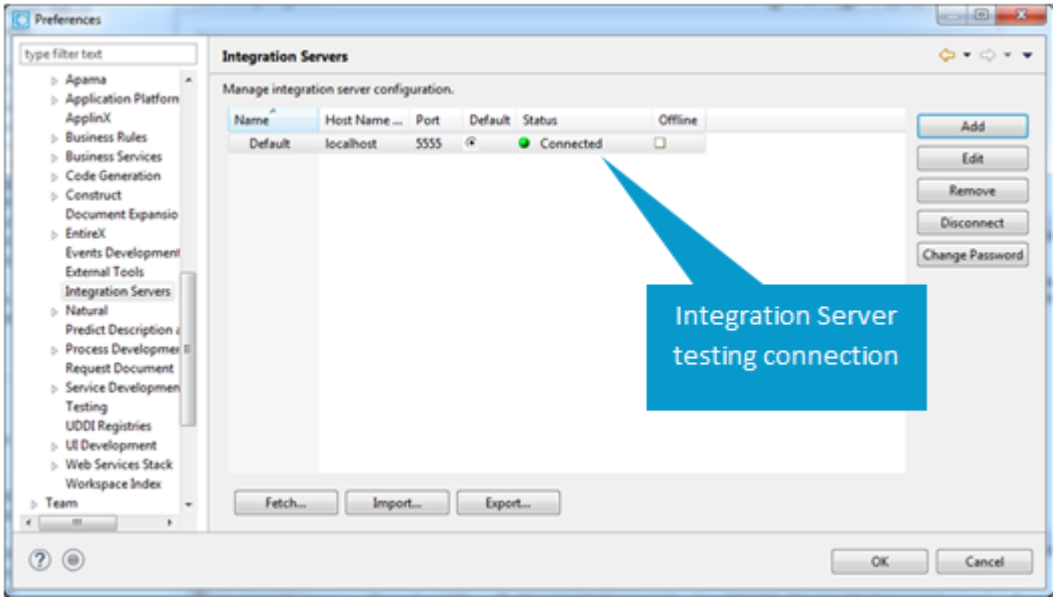

Select RPC Server
Select "connection tab" to customization RPC environment


In input variables, insert the values

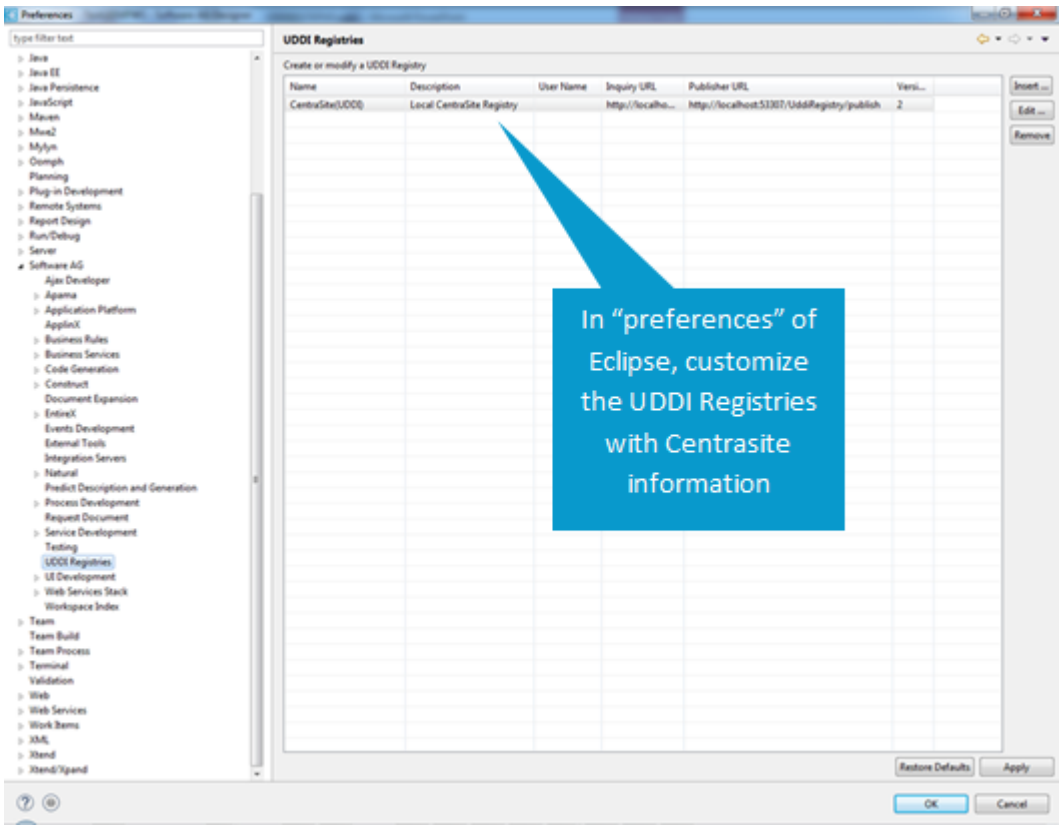


Integration Server customization

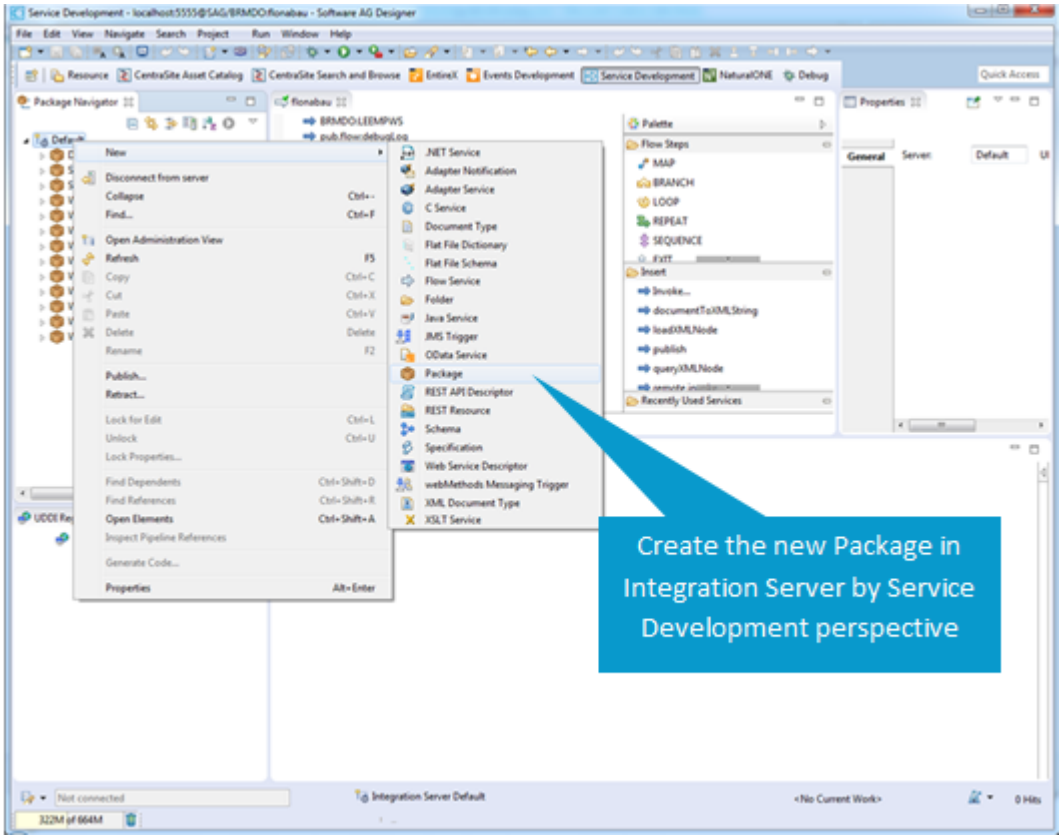


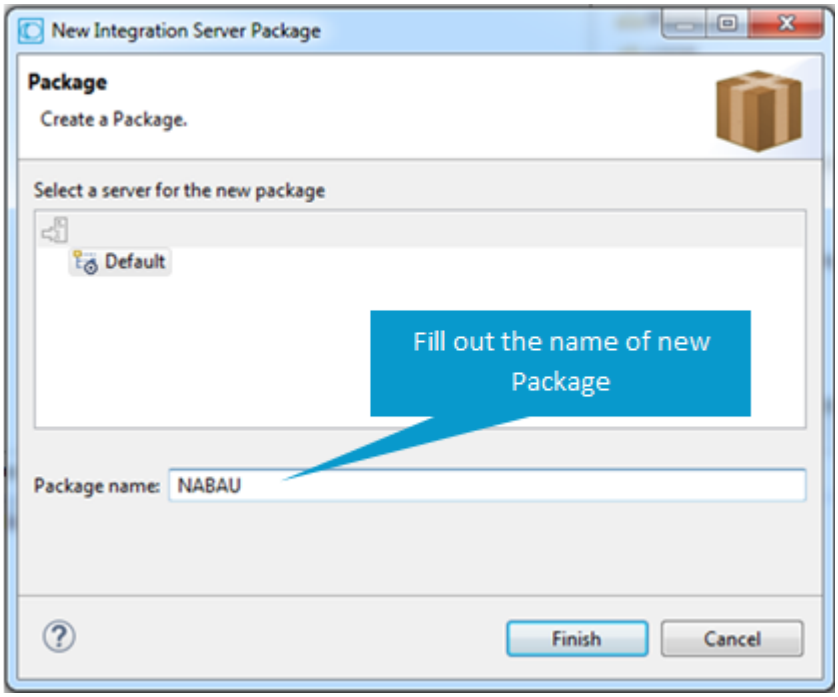


CentraSite repository customization

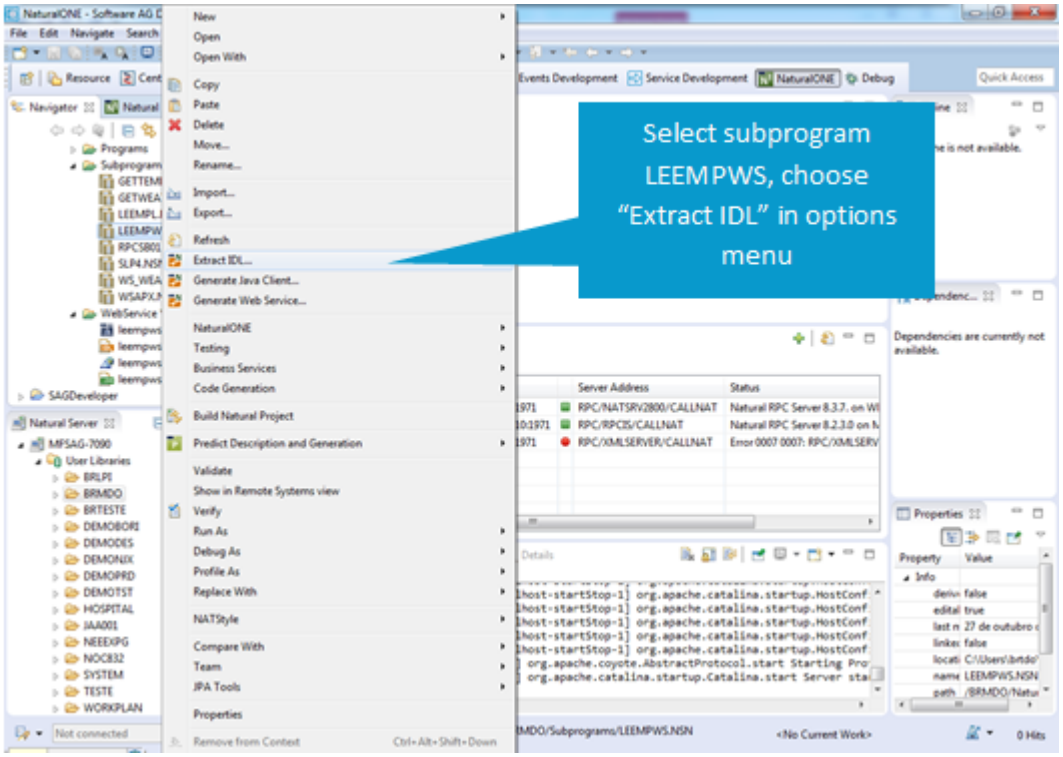


Integration Server – Defining the package

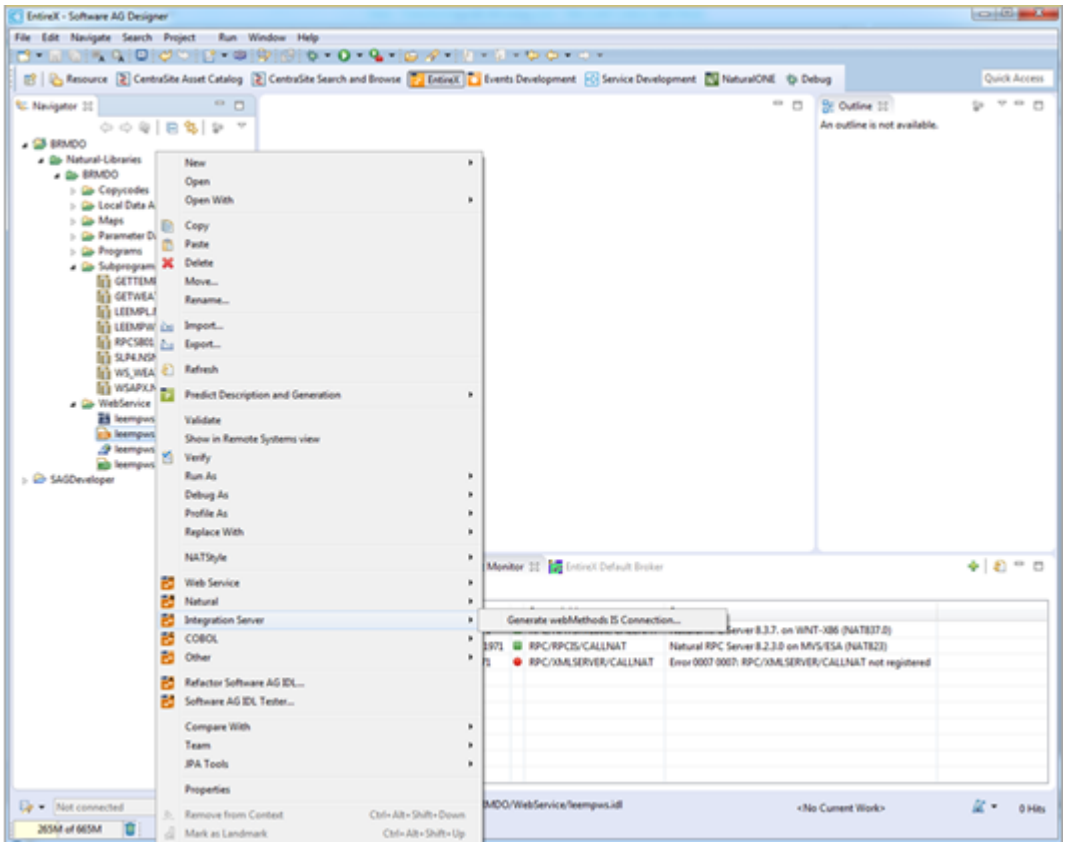


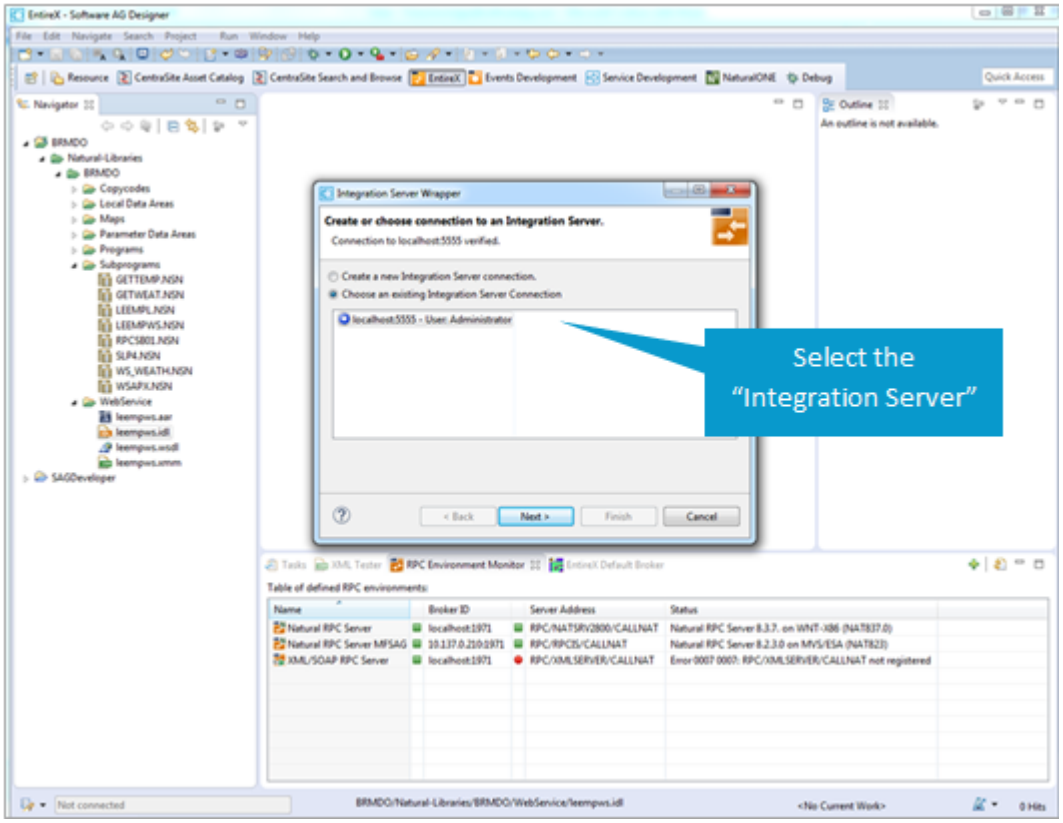


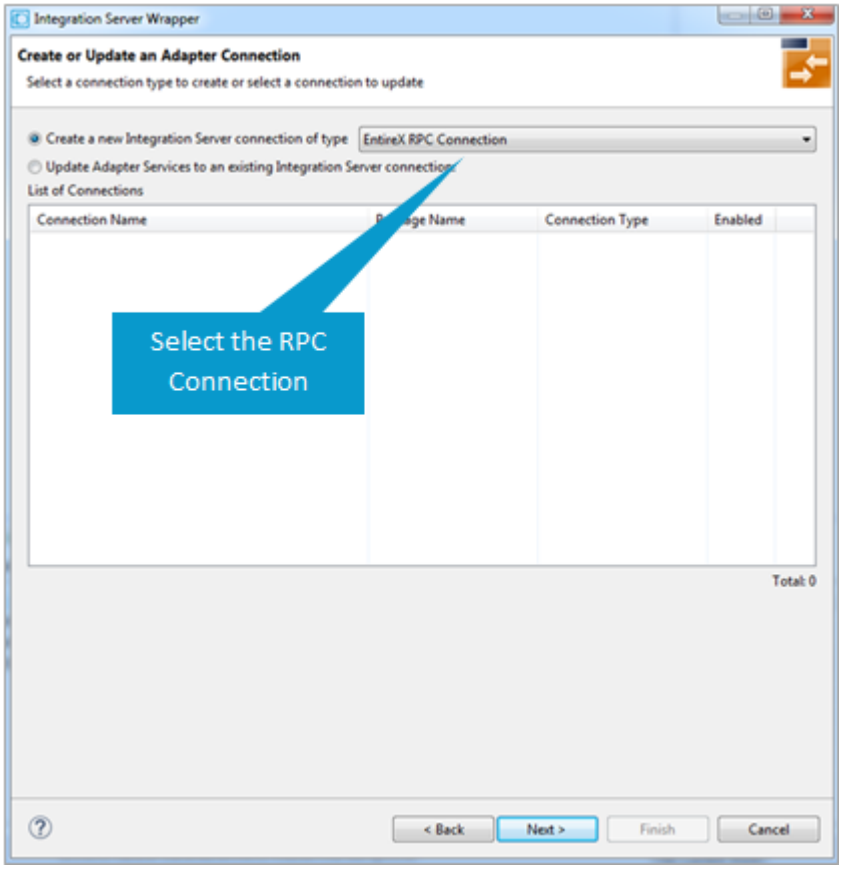
Extracting the IDL from Natural

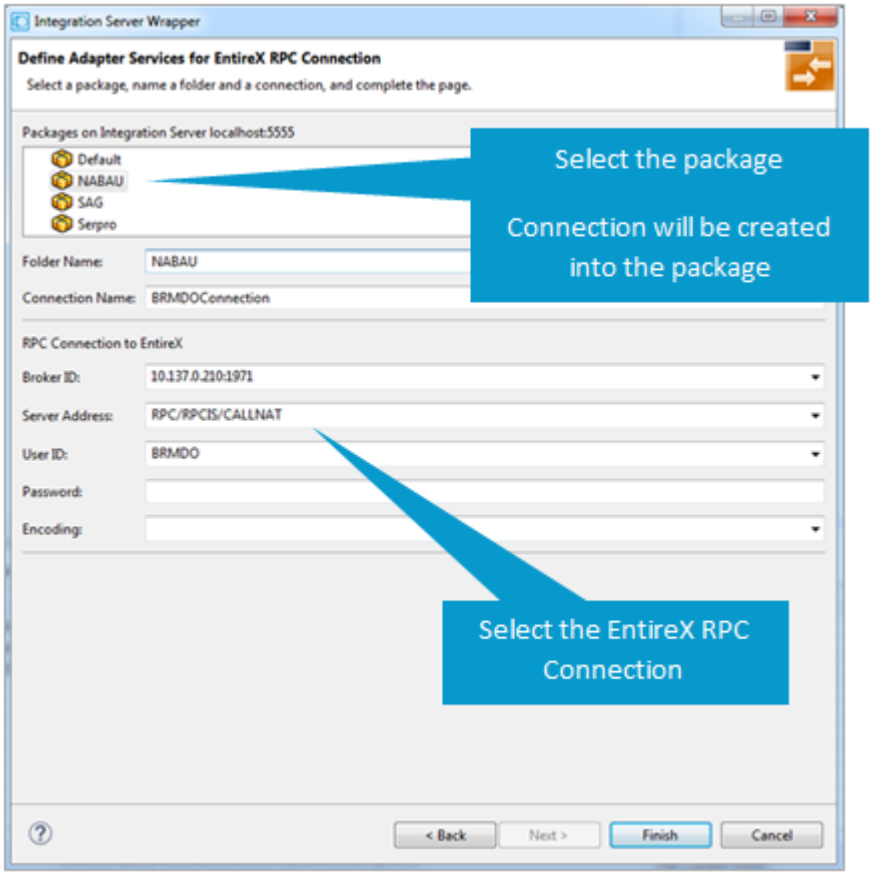


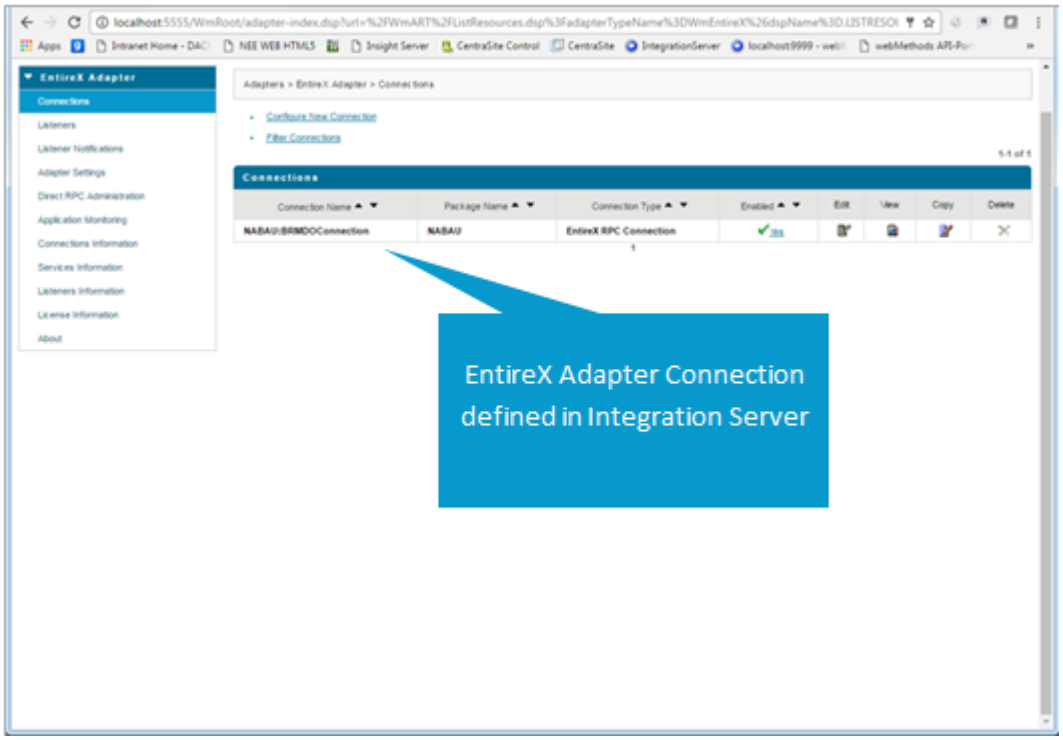
EntireX perspective – Generating the Integration Server connection



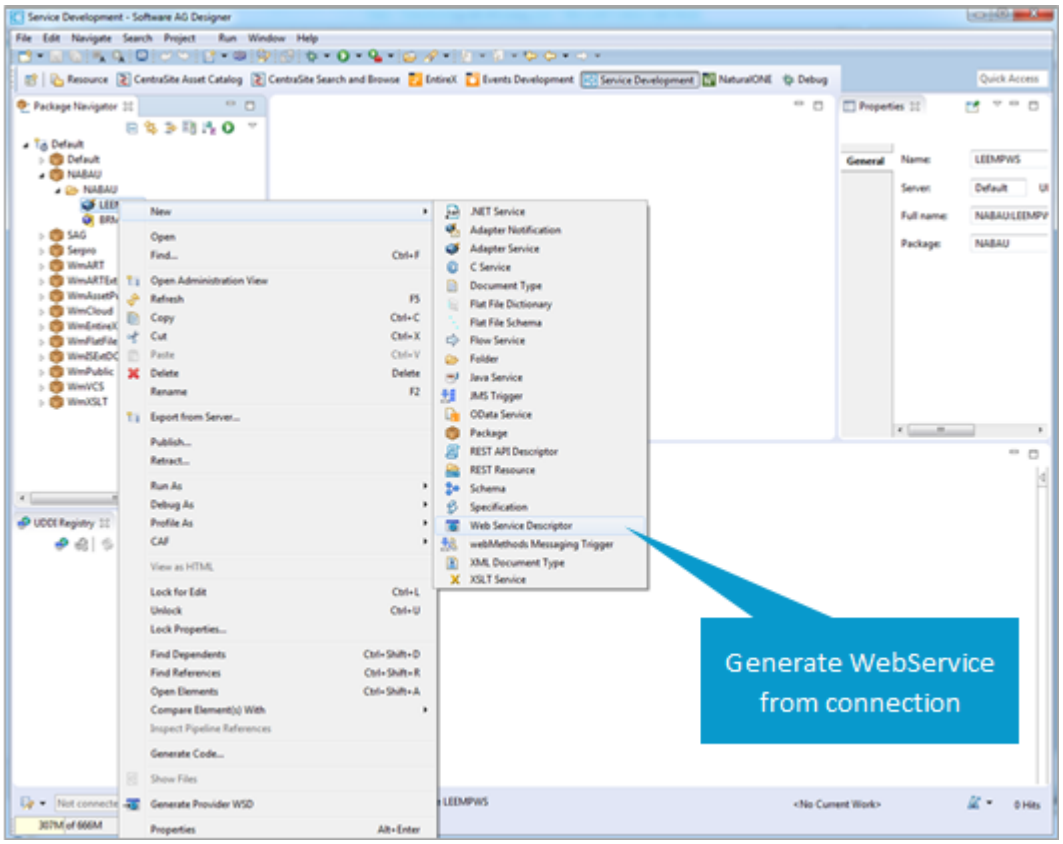

Select the
"Integration Server"

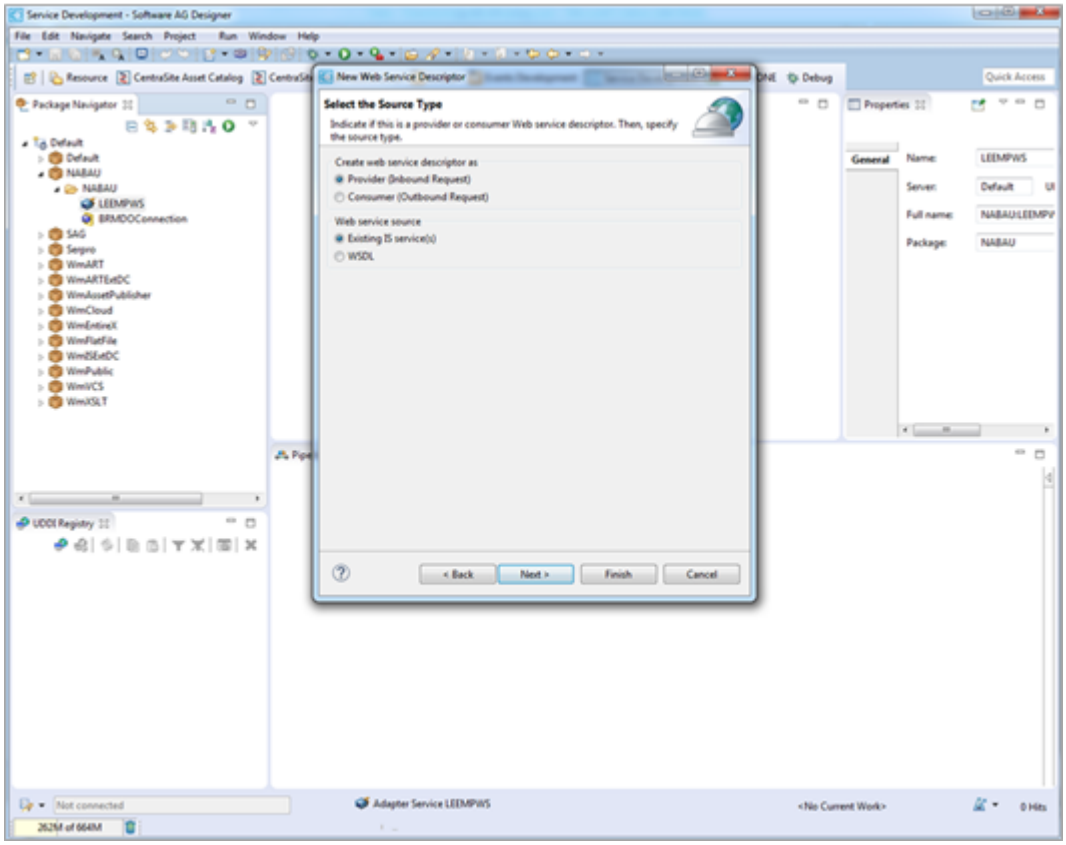

Integration Server Wrapper
Create or Update an Adapter Connection
Select a connection type to create or select a connection to update
Create a new Integration Server connection of type
EntireX RPC Connection
Update Adapter Services to an existing Integration Server connection
List of Connections
Connection Name
Connection Type
Enabled
Select the RPC Connection
Total: 0
< Back
Next >
Finish
Cancel

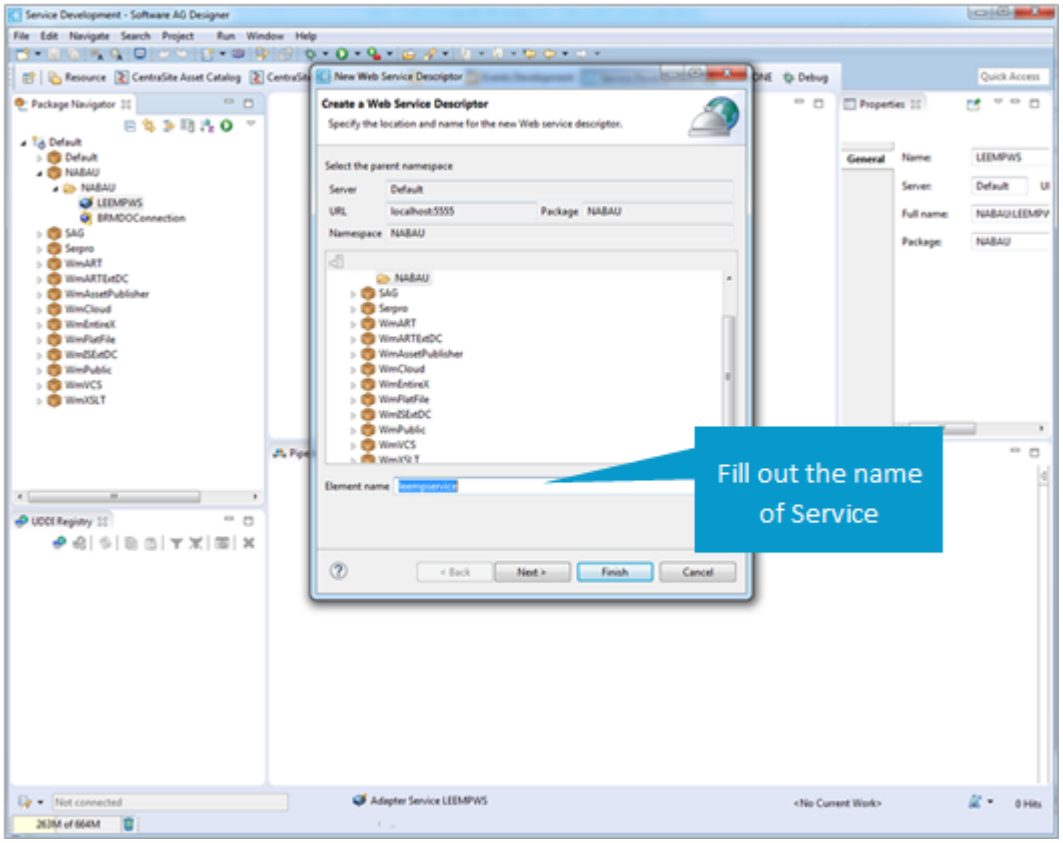

Integration Server Wrapper
Define Adapter Services for EntireX RPC Connection
Select a package, name a folder and a connection, and complete the page.
Packages on Integration Server localhost:5555
Default
NABAU
SAG
Serpro
Select the package
Connection will be created into the package
Folder Name: NABAU
Connection Name: BRMDOConnection
RPC Connection to EntireX
Broker ID: 10.137.0.210:1971
Server Address: RPC/RPCIS/CALLNAT
User ID: BRMDO
Password:
Encoding:
Select the EntireX RPC Connection
< Back
Next >
Finish
Cancel

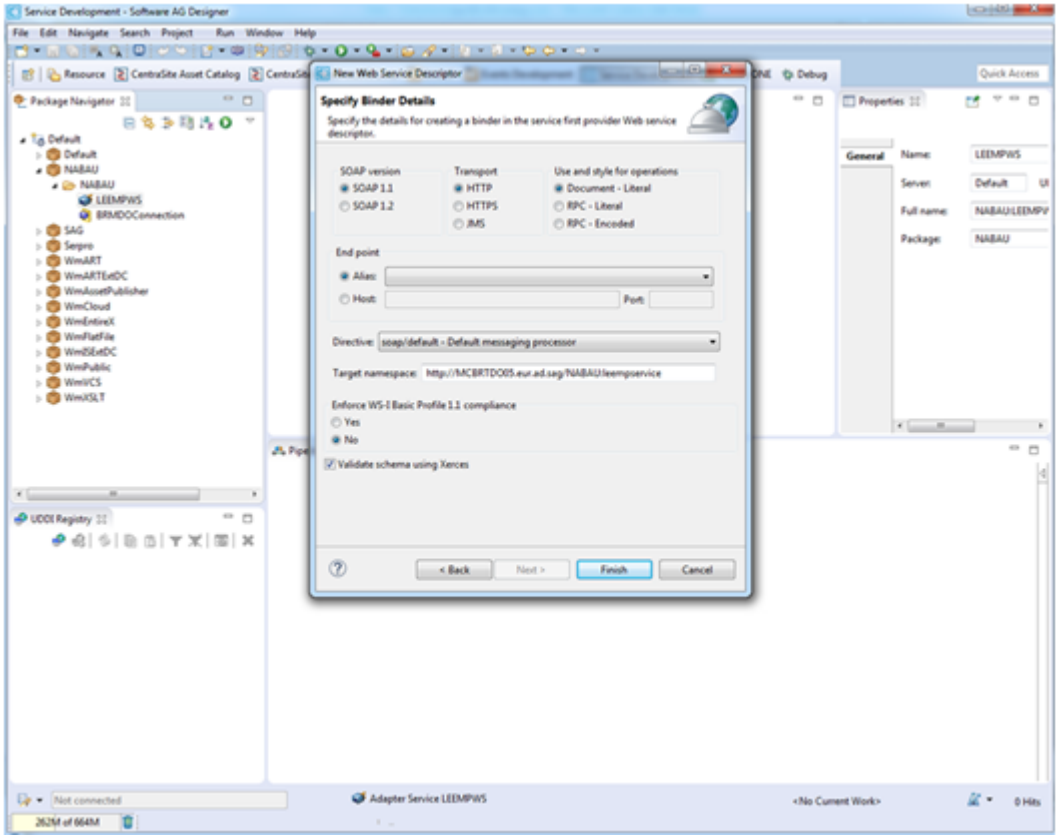

EntireX Adapter
Connections
Listeners
Listener Notifications
Adapter Settings
Direct RPC Administration
Application Monitoring
Connections Information
Services Information
Listeners Information
License Information
About
Adapters > EntireX Adapter > Connections
Configure New Connection
Filter Connections
Connections
Connection Name
Package Name
Connection Type
Enabled
Edit
View
Copy
Delete
NABAU:BRMDOConnection
NABAU
EntireX RPC Connection
EntireX Adapter Connection defined in Integration Server

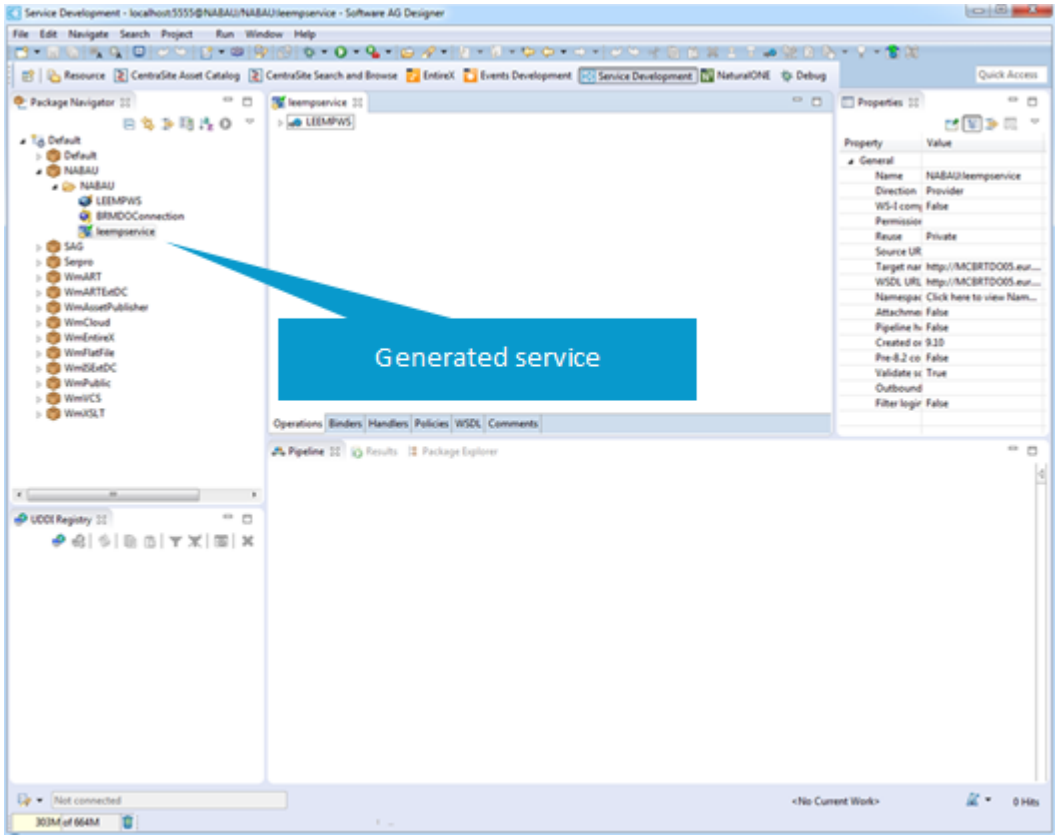
Integration Server –– Generating the web service



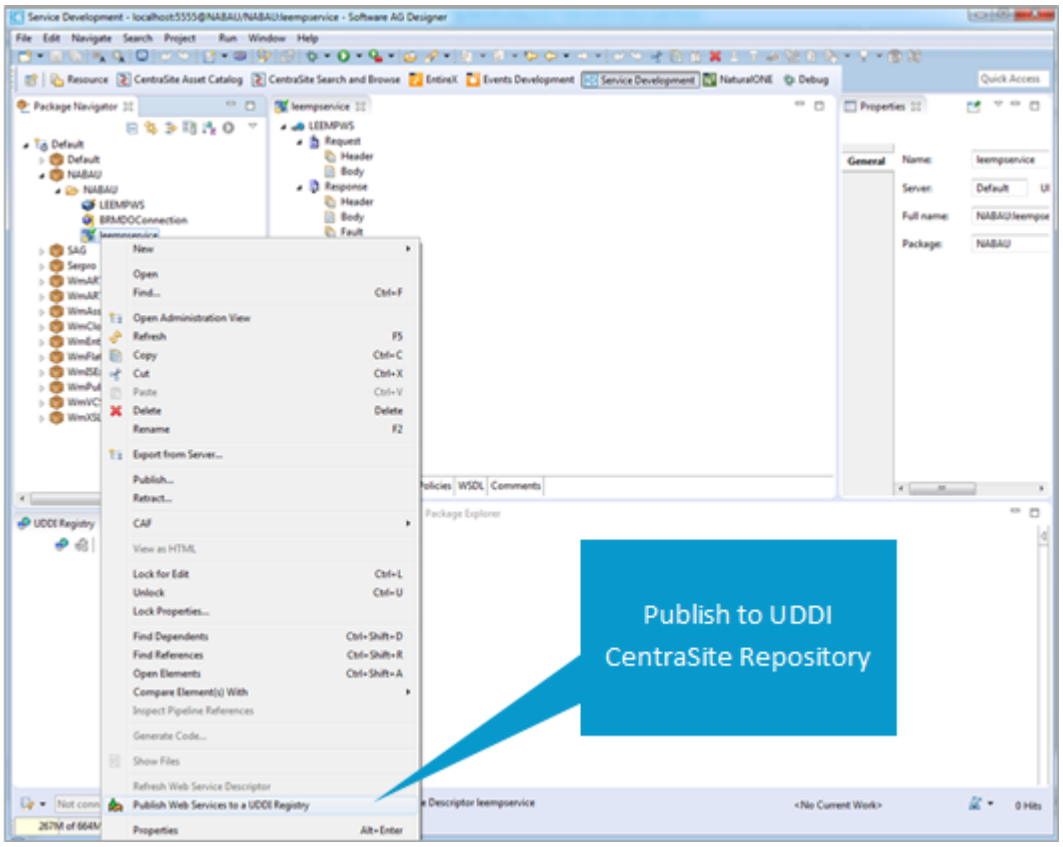

Service Development - Software AG Designer
File Edit Navigate Search Project Run Window Help
Package Navigator
Default
NABAU
LEEMPWS
BRMDOConnection
SAG
Segpro
WmART
WmARTExtDC
WmAssetPublisher
WmCloud
WmEntireX
WmFlatFile
WmISExtDC
WmPublic
WmVCS
WmXSLT
UDDI Registry
New Web Service Descriptor
Select the Source Type
Indicate if this is a provider or consumer Web service descriptor. Then, specify the source type.
Create web service descriptor as
Provider (Inbound Request)
Consumer (Outbound Request)
Web service source
Existing IS service(s)
WSDL
< Back
Next >
Finish
Cancel
Properties
General
Name: LEEMPWS
Server: Default
Full name: NABAU:LEEMPW
Package: NABAU
Not connected
Adapter Service LEEMPWS
<No Current Work>
0 Hits

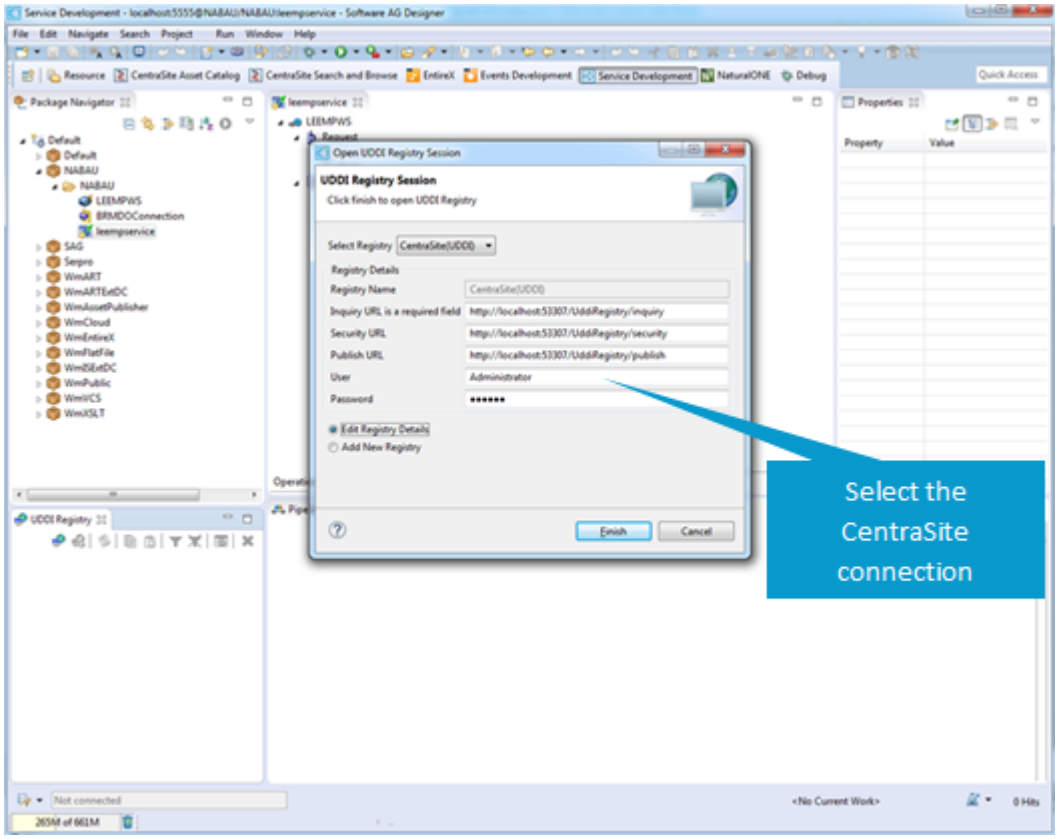

Service Development - Software AG Designer
Create a Web Service Descriptor
Specify the location and name for the new Web service descriptor.
Fill out the name of Service

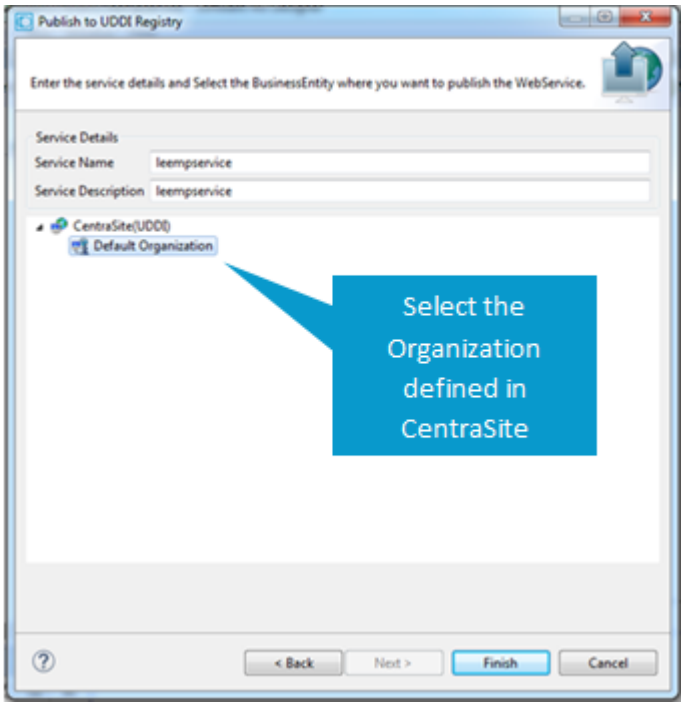

Service Development - Software AG Designer
New Web Service Descriptor
Specify Binder Details
Specify the details for creating a binder in the service first provider Web service descriptor.
SOAP version
SOAP 1.1
SOAP 1.2
Transport
HTTP
HTTPS
JMS
Use and style for operations
Document - Literal
RPC - Literal
RPC - Encoded
End point
Alias:
Host:
Port:
Directive:
soap/default - Default messaging processor
Target namespace:
Enforce WS-I Basic Profile 1.1 compliance
Yes
No
Validate schema using Xerces
< Back
Next >
Finish
Cancel
Properties
General
Name:
LEEMPWS
Server:
Default
Full name:
NABAU:LEEMPW
Package:
NABAU
Package Navigator
UDDI Registry
Adapter Service LEEMPWS
<No Current Work>
0 Hits

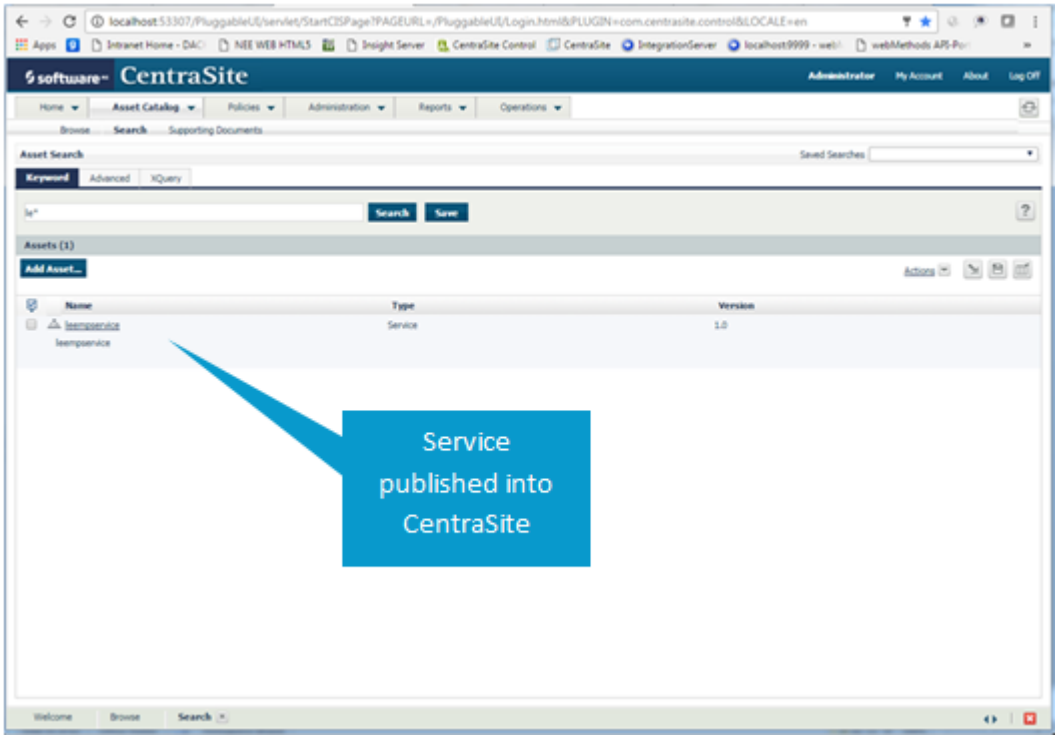

Generated service

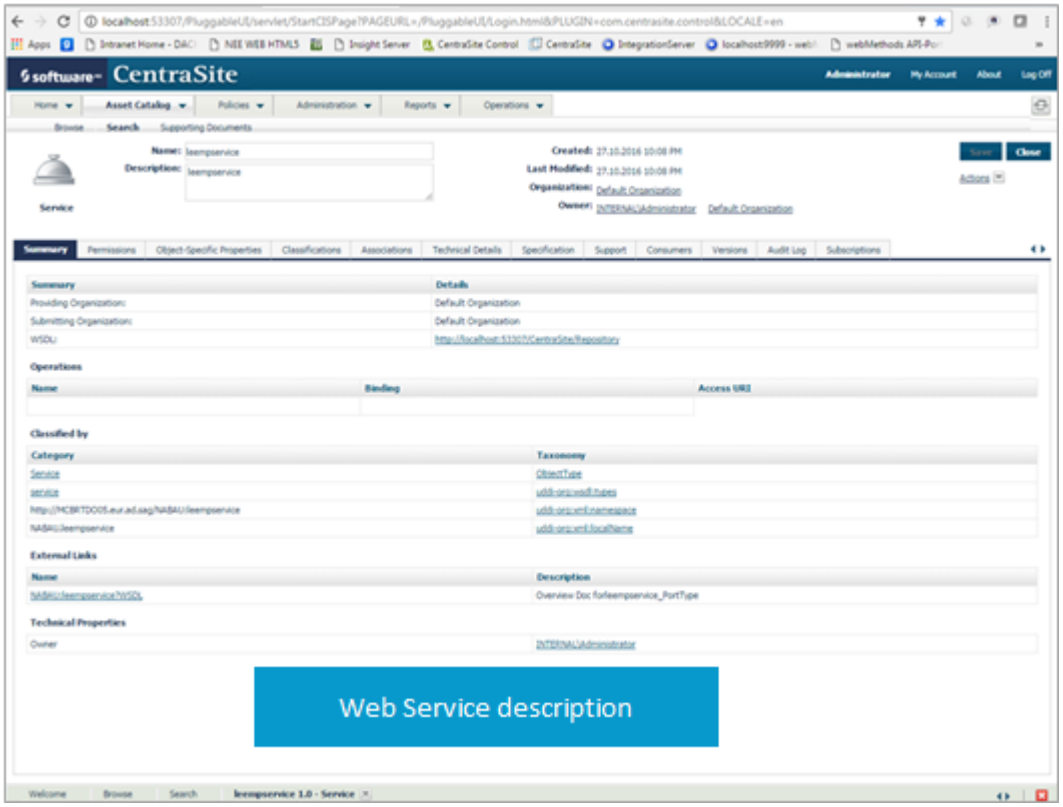
Integration Server – Publishing the web service




Open UDDI Registry Session
UDDI Registry Session
Click finish to open UDDI Registry
Select Registry
CentraSite(UDDI)
Registry Details
Registry Name
Inquiry URL is a required field
Security URL
Publish URL
User
Administrator
Password
Edit Registry Details
Add New Registry
Finish
Cancel
Select the CentraSite connection


Publish to UDDI Registry
Enter the service details and Select the BusinessEntity where you want to publish the WebService.
Service Details
Service Name
leempservice
Service Description
leempservice
CentraSite(UDDI)
Default Organization
Select the Organization defined in CentraSite
< Back
Next >
Finish
Cancel


CentraSite
Service published into CentraSite


CentraSite
Web Service description