

Using the Visual Studio Add-in

Using the Natural Business Services Visual Studio add-in, you can perform the following tasks:

- Configure Connections
 - Use the Business Service Explorer
 - Regenerate a Business Service from the Command Line
 - Use Code Snippets
 - Upgrade an Existing Web Service
-

Configure Connections

Before you can use the Natural Business Services Visual Studio add-in, you must define connections to a remote repository.

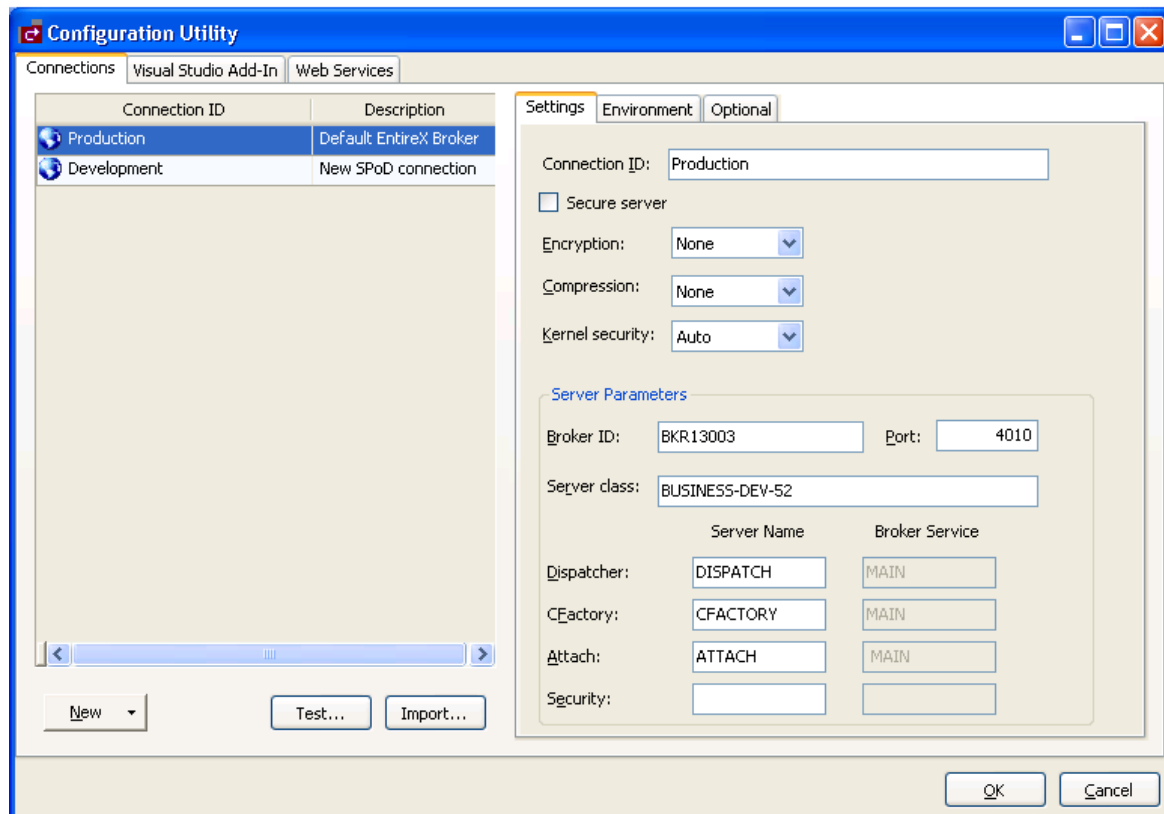
 **To configure a connection:**

- Select **Configuration** on the **NBS** menu.

Note:

You can also display the **Configuration Utility** panel from the Business Service Explorer by opening the context menu for a connection and selecting **Configuration** on the submenu.

The **Configuration Utility** panel is displayed. For example:



Use this panel to configure connections to the remote repository containing your business services. The following tabs are available:

Panel Tab	Description
Connections	Defines connections to remote repositories (via the EntireX Communicator or Natural for Windows protocols). For information, see Connections Tab.
Visual Studio Add-in	Defines configuration settings used by the Natural Business Services Visual Studio add-in. For information, see Visual Studio Add-in Tab.
Web Services	Defines configuration settings that are specific to Web services. For information, see Web Services Tab.

Connections Tab

Use the Connections tab to view, edit, delete, or add connections. These connections define communication paths and options to remove business service repositories running on a Natural server. The Connections tab lists the available connections on the left side and details about the current selected connection on the right (under Settings).

This section covers the following topics:

- Add a Broker Connection
- Add a SPoD Connection
- Copy an Existing Connection
- Modify an Existing Connection
- Import a Connection
- Test a Connection
- Delete an Existing Connection

Add a Broker Connection

A Broker connection uses the EntireX communication protocol to connect to Natural Business Services servers running in Natural. This type of connection is suitable for developing, testing, and running Natural Business Services applications.

Tip:

If you have an existing connection that is similar to the one you want to add, you can copy the connection and then modify it to suit your requirements. For information, see Copy an Existing Connection.

 **To add a Broker connection:**

1. Select **New** on the **Configuration Utility** panel.

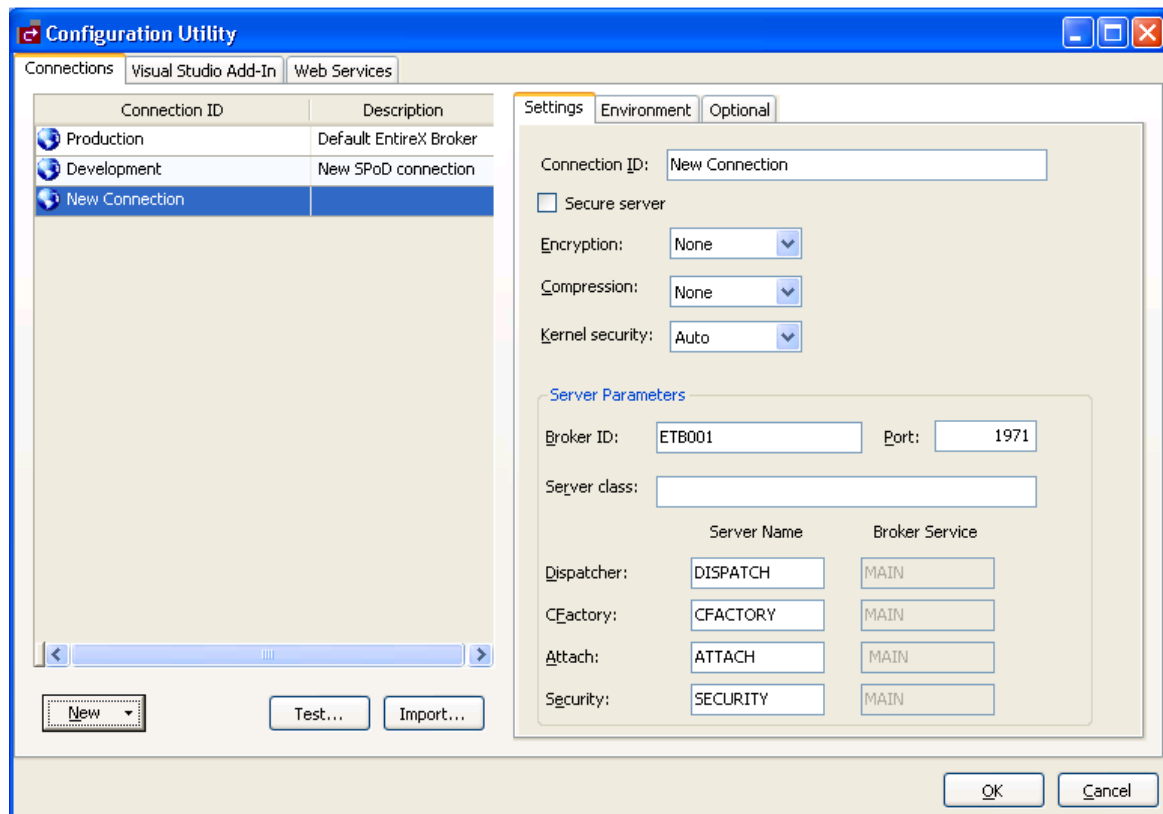
Note:

You can also open the context menu for an existing connection and select **New** on the submenu.

A menu is displayed.

2. Select **Broker connection**.

A blank Broker connection is loaded on the right side. For example:



3. Type the Broker ID.

Tip:

If you have a Natural Business Services server on the mainframe, you cannot use the IP address in your configuration files for the Broker ID. Use the actual broker name and define the IP address in your hosts file if necessary. If you use the IP address, you may receive the EntireX communicator error message '20/186 API Char "." or "," not allowed in ACI CB' when downloading metadata.

4. Type the TCP/IP port number the EntireX broker is running on.

Note:

If you intend to define the port in your Windows services file, leave this option blank.

Optionally, you can specify the following information:

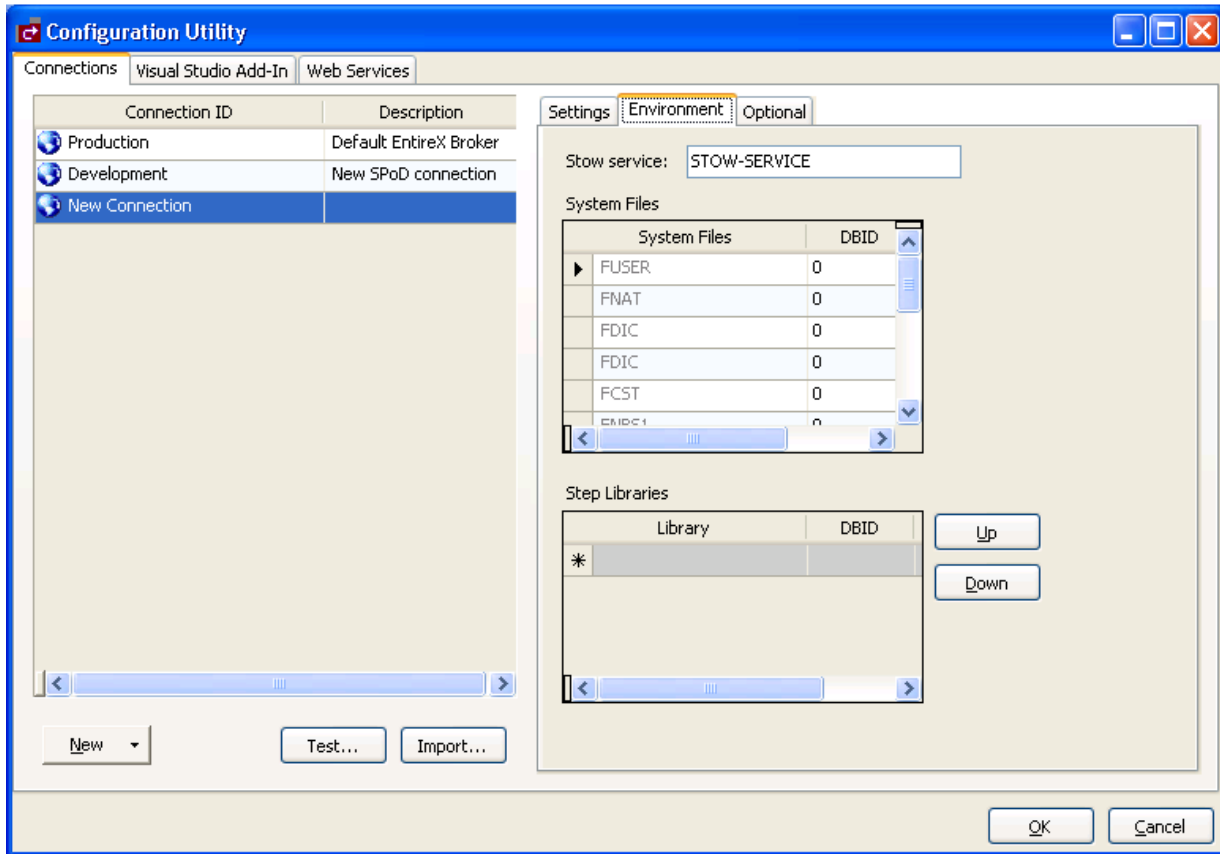
Setting	Description
Connection ID	Unique name of the server component that provides communications between the client and server. This name is listed in the Business Service Explorer and used in code when creating connections to business services. All communications are done by Connection ID.
Secure server	Select this option if the server is running Natural Security or Natural Business Services security and a password must be transported in the communication buffer. Note: If you select this option, also select Encryption .
Encryption	Select this option to encrypt messages transported to and from the server. This value is based on the EntireX ACI settings for encryption.
Compression	Select this option to compress messages at a specified level. This value is based on the EntireX ACI settings for compression. Note: The higher the level, the more CPU processing is required to compress and decompress the message. As this may end up saving a lot of network bandwidth, it is worth the CPU trade off in most instances.
Kernel security	Select this option to use Broker security for the EntireX server. If you are not sure which security is used, you can leave this setting on Auto. To achieve the best network performance, however, you should select Yes or No.
Server class	EntireX server class defined for your business services. If you do not know this value, ask your Natural Business Services administrator.
Dispatcher, CFactory, Attach, and Security	Timestamp server names of the four Natural Business Services runtime servers. Leave these values as the defaults; only your Natural Business Services administrator should change these values.

5. Select **OK** to save your new Broker connection.
6. Open the context menu for the Connections node in the Business Service Explorer.
7. Select **Refresh** on the submenu.

The connection is added to the list of available connections.

Environment Tab

This tab contains the System Files and Step Libraries tables for your new Broker connection. For example:



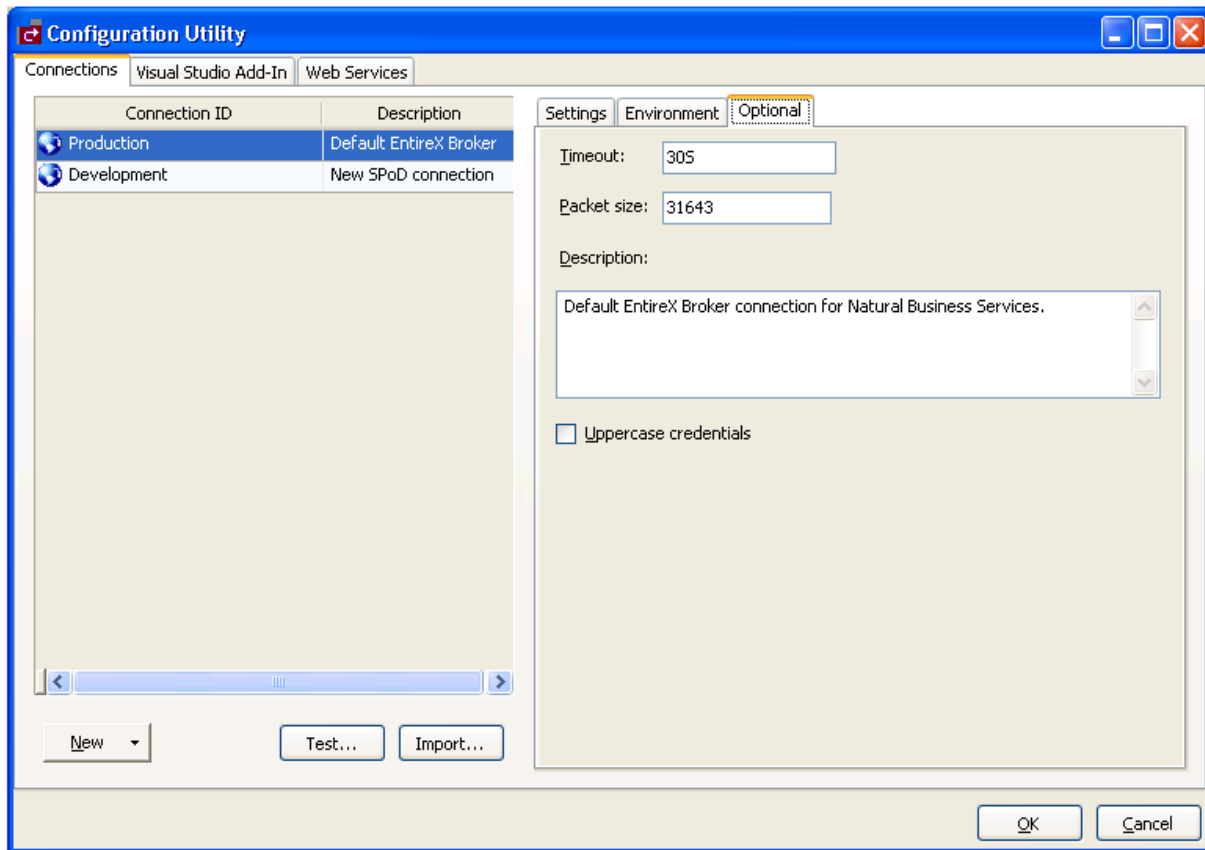
Use this tab to override the current defaults used in the Natural Business Services server environment.

Note:

Unless you have a compelling reason to override the defaults, we recommend that you do not change the defaults.

Optional Tab

This tab defines optional settings for your business service connections. For example:



Use this tab to define the following optional settings for your new connection:

Setting	Description
Timeout	Timeout value used by the Natural Business Services dispatcher when making remote service calls. The default is 30S (30 seconds).
Packet size	Default packet size for communication messages. If you have many business services using interfaces larger than the default (31643 bytes), increase this size. Note: If required, Natural Business Services will increase the size dynamically at runtime, but this will affect performance.
Description	Description of the connection. For example, you can type "This is a development connection."
Uppercase credentials	Select this option if the user ID and password must be sent in upper case. Note: This option is not recommended for Natural Business Services server environments running on Unix or Linux.

Add a SPoD Connection

A SPoD connection uses the Natural Single Point of Development (SPoD) protocol to communicate with the Natural Development Server (NDV) running in a Natural environment that contains Natural Business Services. This type of connection is only suitable for developing and testing Natural Business Services applications.

Note:

The Optional tab contains the same options as when adding a new Broker connection. For information, see Optional Tab.

Tip:

If you have an existing connection that is similar to the one you want to add, you can copy the connection and then modify it to suit your requirements. For information, see Copy an Existing Connection.

 **To add a SPoD connection:**

1. Select **New** on the **Configuration Utility** panel.

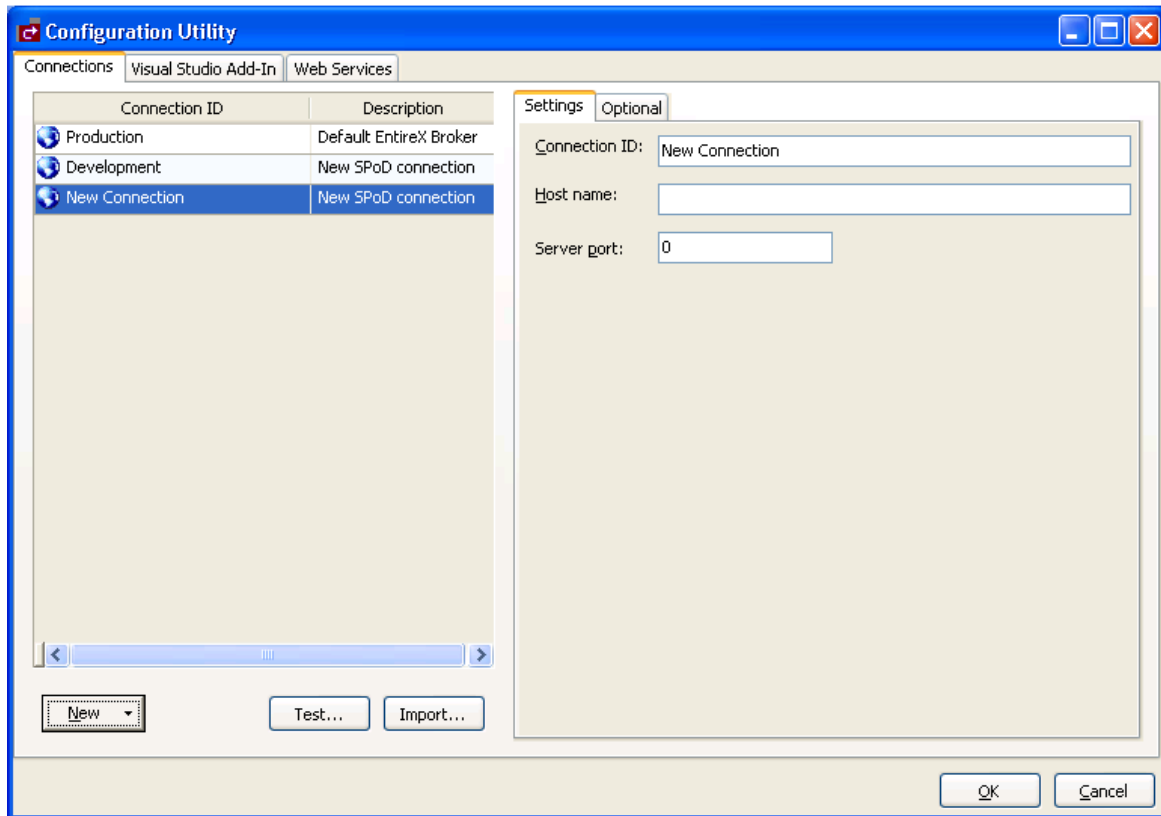
Note:

You can also open the context menu for an existing connection and select **New** on the submenu. For information, see Copy an Existing Connection.

A menu is displayed.

2. Select **SPoD connection**.

A blank SPoD connection is loaded on the right side. For example:



3. Enter the following information on the Settings tab:

Setting	Description
Connection ID	Unique name of the server component that provides communications between the client and server. This name is listed in the Business Service Explorer and used in code when creating connections to business services. All communications are done by Connection ID.
Host name	Name of the server running Natural Development Server (NDV). You may also enter a TCP/IP address.
Server port	TCP/IP port for the NDV server. This value is required. Note: You cannot use the Windows services file to look up this value.

4. Enter the following information on the Optional tab:

Setting	Description
Session parameters	Any session parameters required to connect to your environment. This can be a profile setting, such as PROFILE=NBS52.

5. Select **OK** to save your new SPoD connection.
6. Open the context menu for the Connections node in the Business Service Explorer.
7. Select **Refresh** on the submenu.

The connection is added to the list of available connections.

Copy an Existing Connection

To save time and effort, you can copy an existing connection and then modify it to suit your requirements.

To copy an existing connection:

1. Open the context menu for an existing connection on the **Configuration Utility** panel.
2. Select **Copy** on the submenu.

The settings for the Copy of *ConnectionName* connection are displayed. The new connection has the same settings as the existing connection.

3. Change the settings as required.

For example, change the connection name from Copy of *ConnectionName* to another name.

4. Select **OK** to save the new connection.
5. Open the context menu for the Connections node in the Business Service Explorer.
6. Select **Refresh** on the submenu.

The connection is added to the list of available connections.

Modify an Existing Connection

This option allows you to change the settings for an existing connection.

To modify an existing connection:

1. Open the context menu for an existing connection in the Business Service Explorer.
2. Select **Configuration** on the submenu.

The **Configuration Utility** panel is displayed.

3. Modify the configuration settings as desired.

For information on the configuration settings, see:

- Add a Broker Connection
- Add a SPoD Connection

4. Select **OK** to save the new settings.

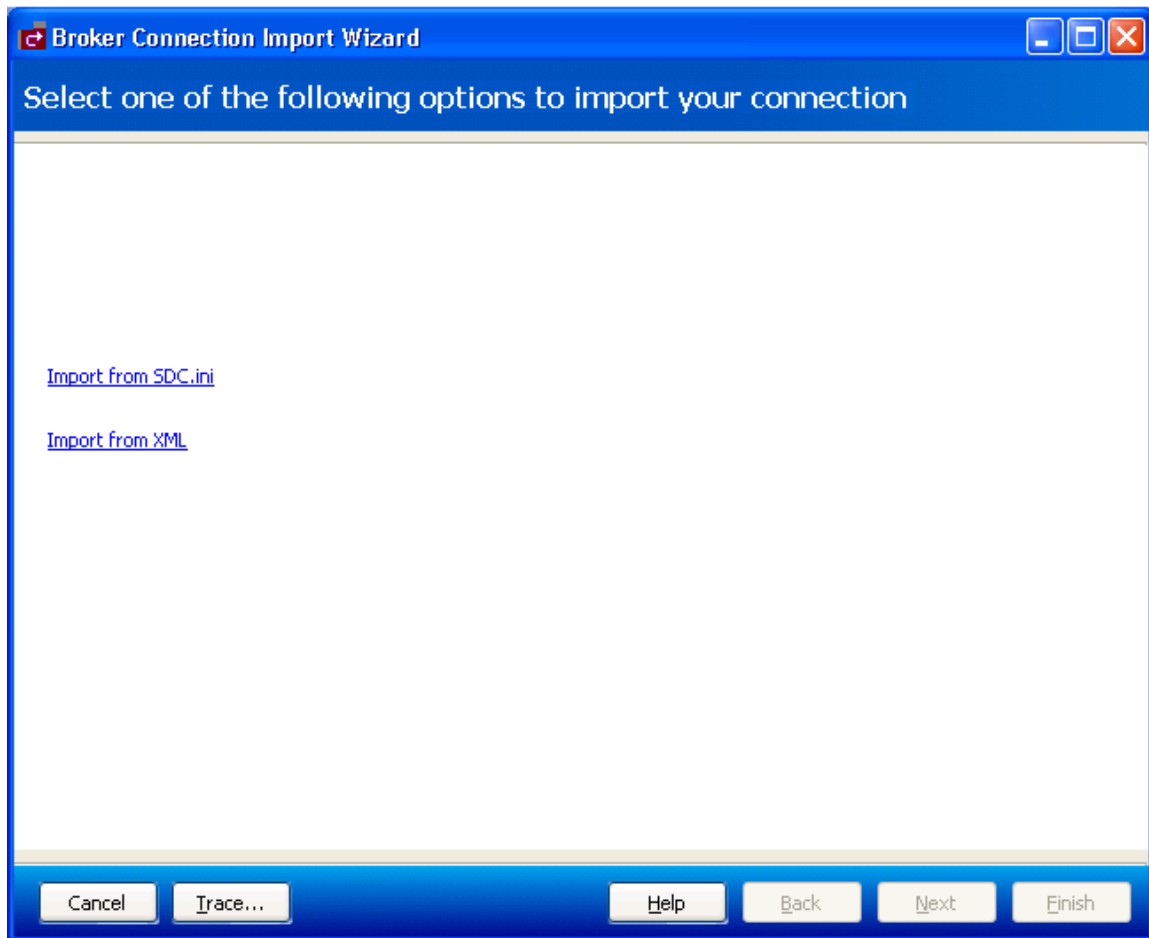
Import a Connection

This option allows you to import connection IDs from different sources: SDC.ini or XML.

▶ To import a connection from SDC.ini or XML:

1. Select **Import** on the **Configuration Utility** panel.

The Broker Connection Import wizard is displayed. For example:



2. Select one of the following options:

Option	Description
Import from SDC.ini	Select this option to import a Broker connection from SDC.ini. Enter the name of the connection file in File name.
Import from XML	Select this option to import either a Broker or SPoD connection from XML. Enter the name of the connection file in File name.

3. Select **Finish** to import the connection.

Test a Connection

To test a connection:

1. Select the connection you want to test on the **Configuration Utility** panel.
2. Select **Test**.

The **Connection Test** window is displayed.

Note:

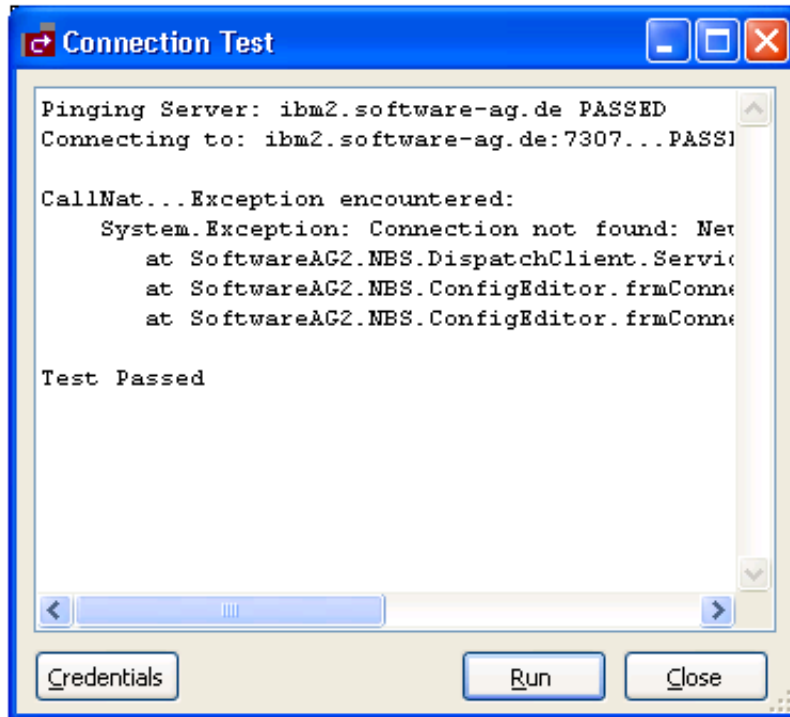
If the connection is secured, select **Credentials** to enter the user ID and password for the connection.

3. Select **Run**.

Natural Business Services performs the following test process:

1. Pings the specified Broker ID or Host name.
2. Connects to the Broker ID or Host name and port using TCP/IP.
3. Pings the Natural Business Services attach server.
4. If the attach server is running, attempts to ping a Natural Business Services dispatcher.
5. If no dispatchers are running, asks the attach server to initiate a new dispatcher.
6. Sends the system profile command to a running dispatcher.
7. Performs a test service call, which invokes the Calculator business service in the Demo domain.

The following example shows the results of testing a connection:



Delete an Existing Connection

This option allows you to remove a connection from the list of available connections.

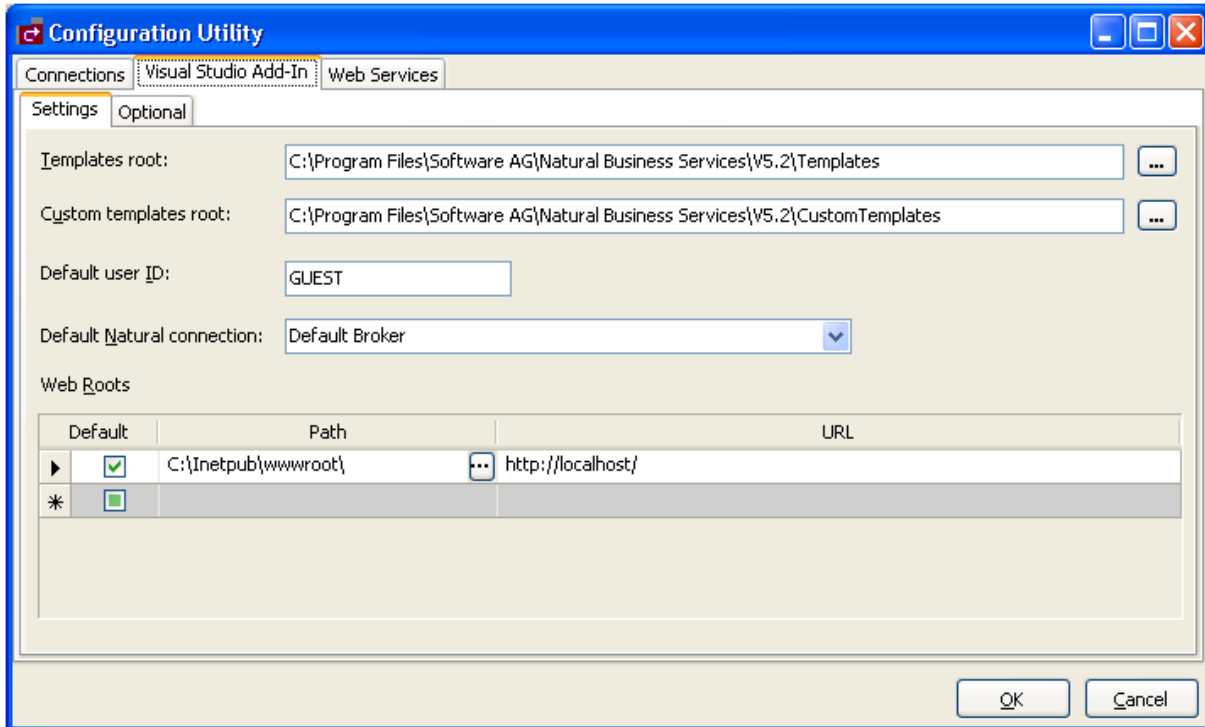
▶ To delete an existing connection:

1. Open the context menu for an existing connection on the **Configuration Utility** panel.
2. Select **Delete** on the submenu.
A confirmation window is displayed.
3. Select **Yes**.
4. Open the context menu for the Connections node in the Business Service Explorer.
5. Select **Refresh** on the submenu.

The connection is removed from the list of available connections.

Visual Studio Add-in Tab

The following example shows the Natural Business Services Visual Studio Add-in tab on the **Configuration Utility** panel:

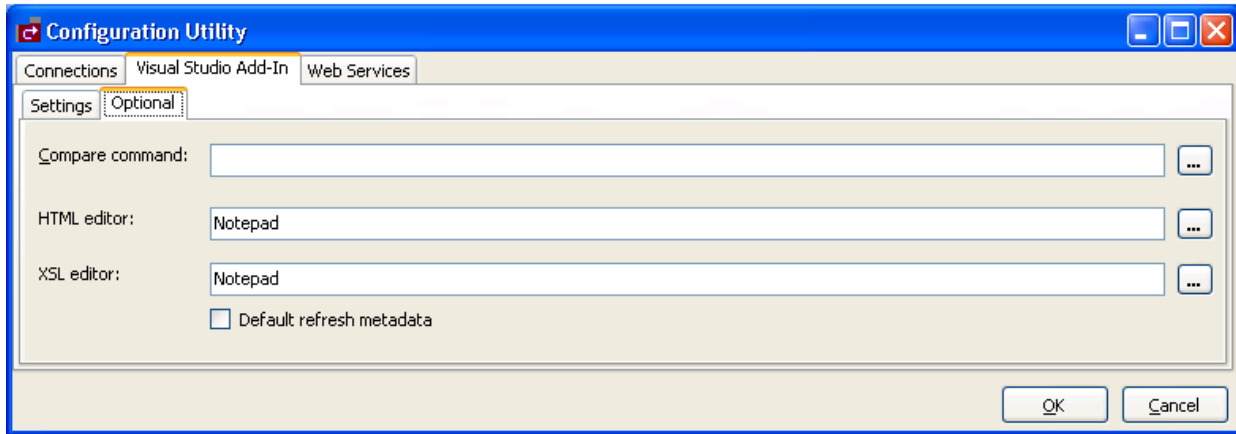


Use this tab to define the Visual Studio add-in settings used for all connections. These settings include:

Setting	Description
Templates root	Path on your system to the code templates required by the Natural Business Services wizards for code generation.
Custom templates root	Path to the directory containing customizations or modifications to the supplied templates. Templates stored in this location must follow the same folder structure and naming standards as the Templates Root path. Any templates located in this folder are loaded first.
Default user ID	Default user ID used when connecting to Natural Business Services repositories.
Default Natural connection	Default connection ID used by the Visual Studio add-in.
Web Roots	Paths used by the add-in (for information, see Modify Web.config Files).

Optional Tab

The following example shows the Optional tab on the Visual Studio Add-in tab:

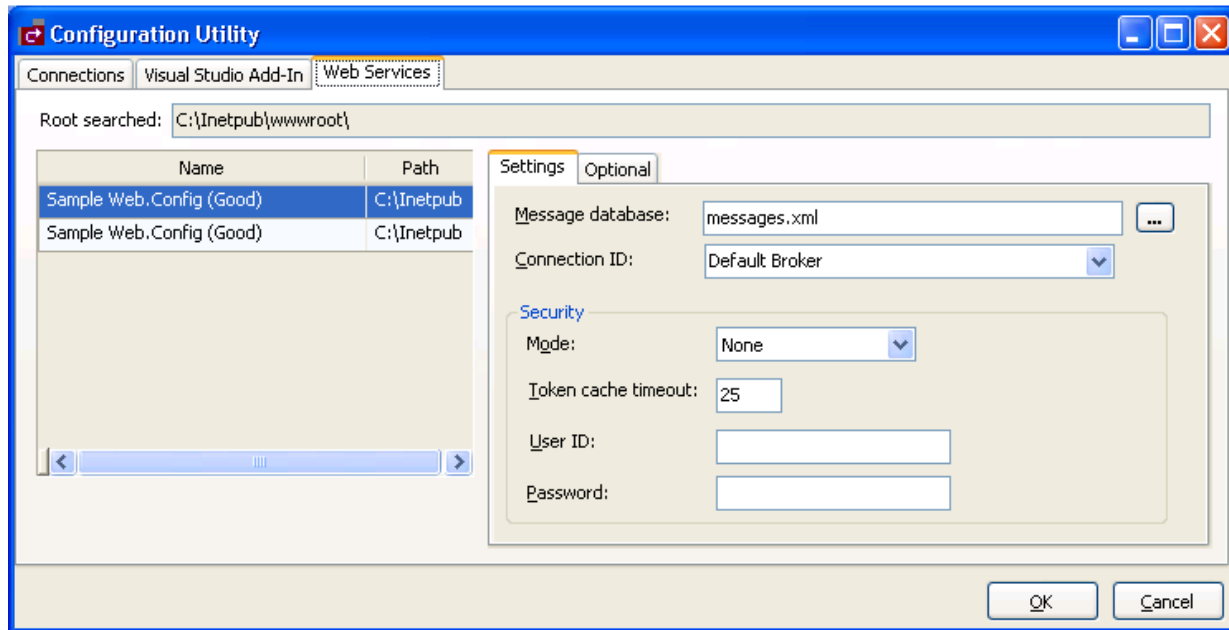


Use this tab to define optional settings used for all connections. These settings include:

Setting	Description
Compare command	Path to a comparison utility used by the code generator wizards. When you select Show differences in the generate results, this comparison utility is invoked. Use %1 and %2 to pass in the names of the files you want to compare.
HTML editor	Name of the default HTML editor used by the Visual Studio add-in.
XSL editor	Name of the default XSL editor used by the Visual Studio add-in.
Default refresh metadata	If this field is marked, the Natural Business Services wizards download new copies of service metadata when regenerating classes or Web services.

Web Services Tab

The following example shows the Web Services tab on the **Configuration Utility** panel:



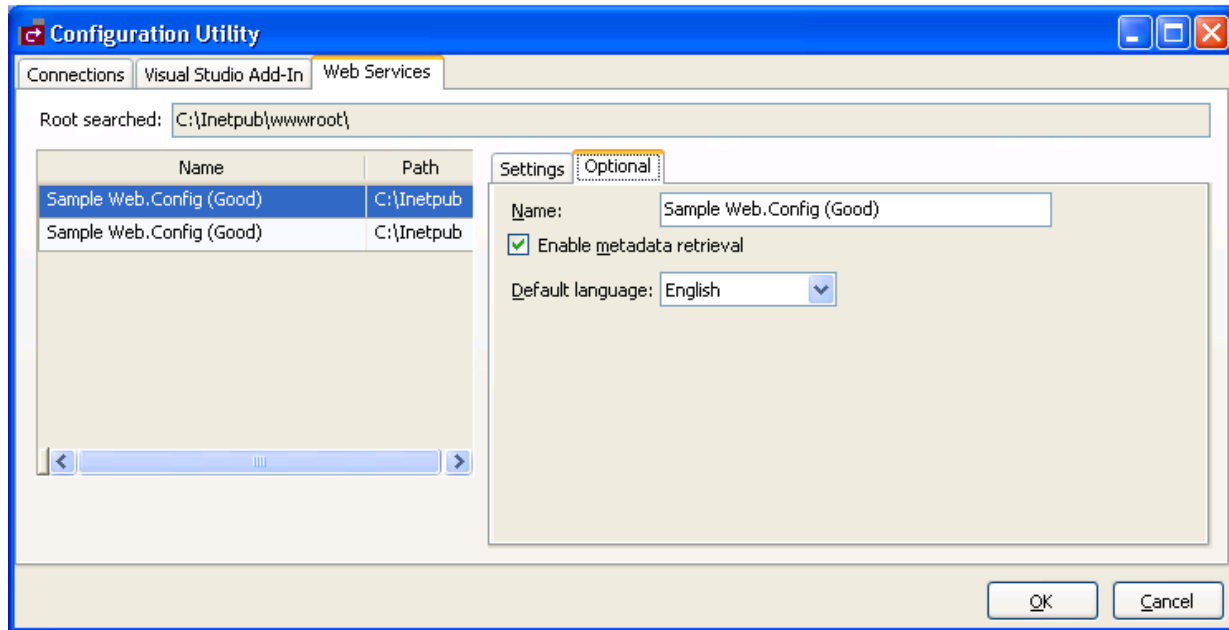
Use this tab to configure the *Web.config* file for Natural Business Services web roots defined in IIS (Internet Information Server). These settings are:

Setting	Description
Message database	Indicates where messages are located. You can either supply the file location for your own messages (for example, mymessages.xml) or you can modify messages in the supplied <i>messages.xml</i> file (message numbers 5700–5799). For more information, see <i>Message database</i> .
Connection ID	Unique name of the server component that provides communications between the client and server. This name is listed in the Business Service Explorer and used in code when creating connections to business services. All communications are done by Connection ID.
Mode	Natural Business Services security mode for Web services.
Token cache timeout	Timeout limit for the security token cache. The default is 25 minutes.
User ID	Default user ID sent with SOAP messages.
Password	Default password sent with SOAP messages.

These settings are used for all connections; they are not specific to one type of connection. For more information, see *Modify Web.config Files*.

Optional Tab

The following example shows the Optional tab on the Web Services tab:



Use this tab to define optional settings for Web services. These settings are:

Setting	Description
Name	Default name of the Web.config file for Web services.
Enable metadata retrieval	Select this option to allow Web services to retrieve metadata.
Default language	Default language for Web services.

Use the Business Service Explorer

The Business Service Explorer lists all defined business service connections in a tree view.

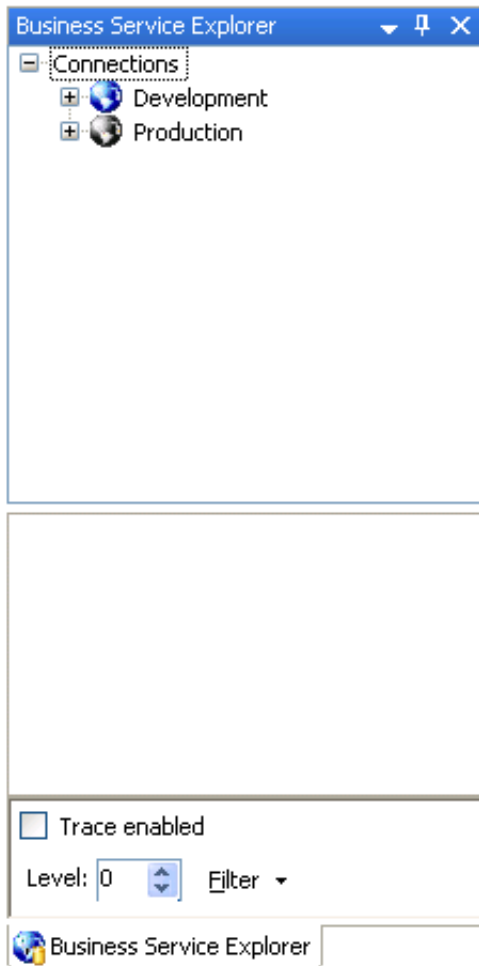
Note:

To create new business services, see Natural Business Services Natural Plug-in and Natural Business Services Administration.

► To access the Business Service Explorer:

1. Select **Business Service Explorer** on the **NBS** menu.

The Business Service Explorer is displayed. For example:



2. Move the explorer window to the location of your choosing.

Note:

By default, the window is dockable. You can use the context menu for the Business Service Explorer title bar to redefine this window as Floating or Tabbed Document.

Use the Business Service Explorer to:

- Access the Business Services
- Find a Business Service
- Set Trace Options
- Show Environment Information for a Connection

Access the Business Services

▶ To access the business services:

1. Select the connection node containing the business services.

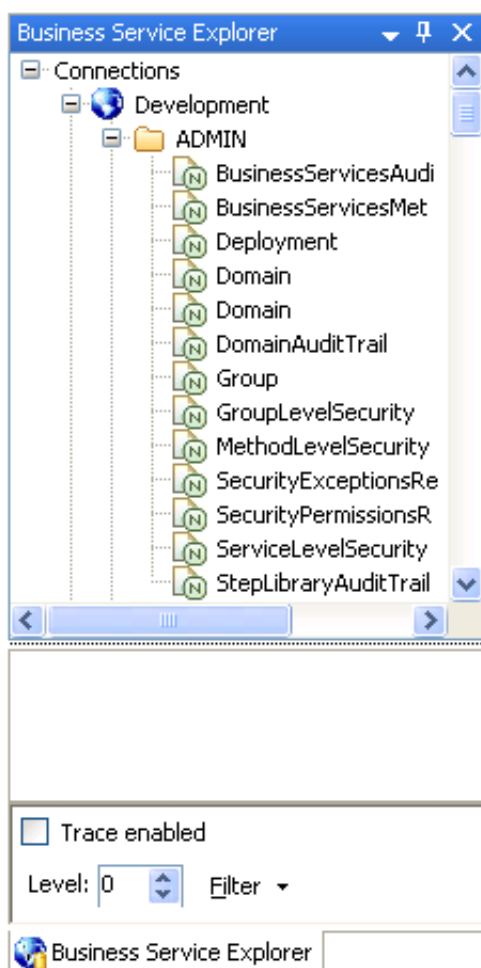
The **Logon** window is displayed.

2. Enter your user ID and password.
3. Select **OK** in the **Logon** window.

The Natural Business Services server retrieves the list of domains for the specified connection.

4. Select a domain node.

The server retrieves the list of business services in the selected domain. For example:

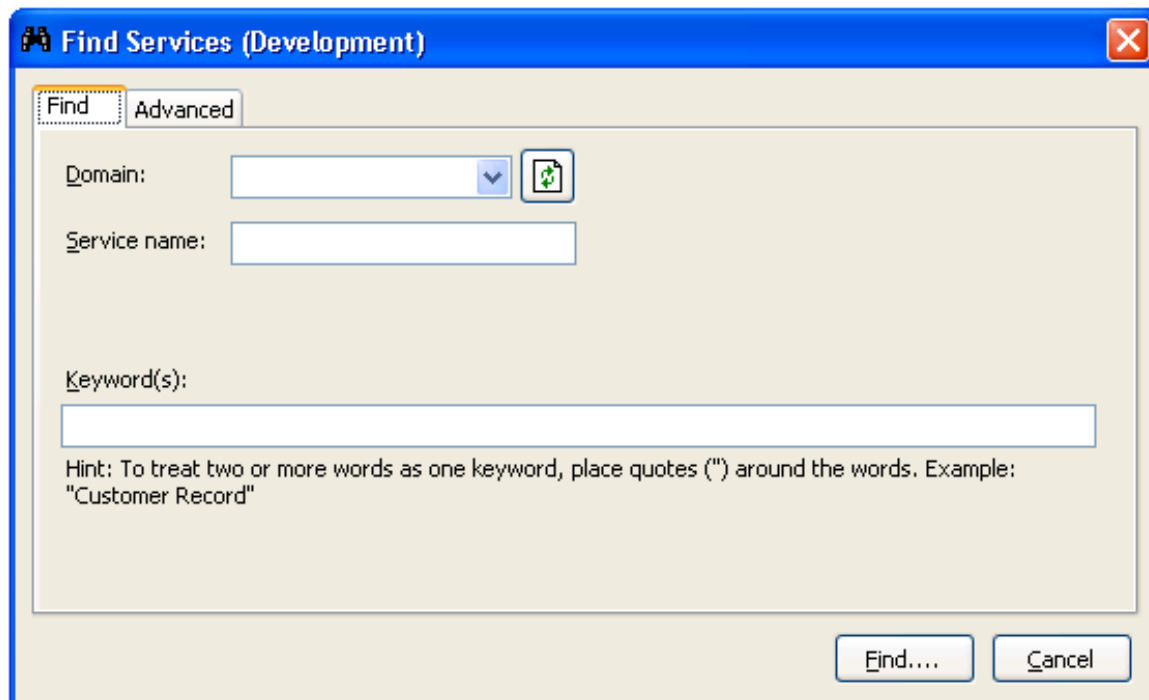


Find a Business Service

▶ **To find all business services in a specific domain:**

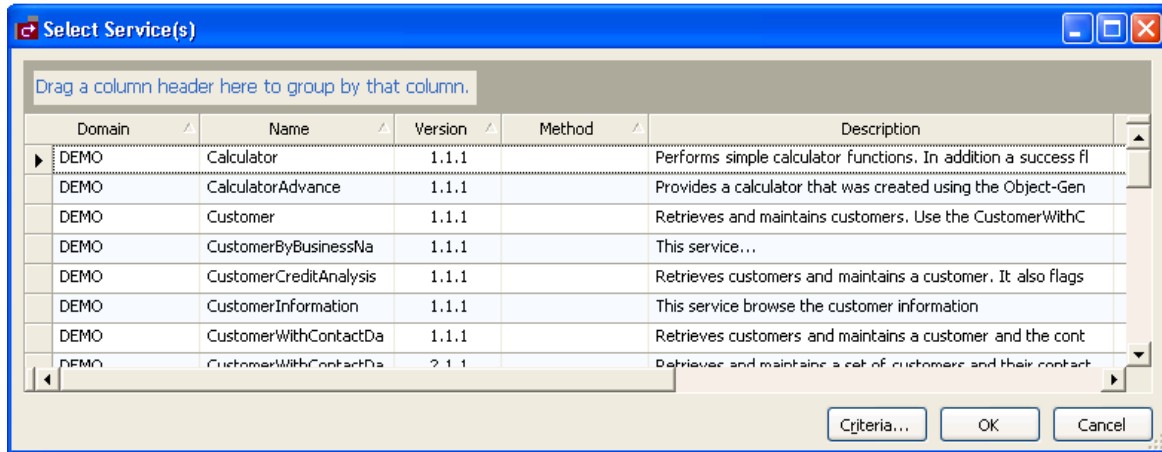
1. Open the context menu for a domain listed in the Business Service Explorer.
2. Select **Find service/create Web service** on the submenu.

The **Find Services** window is displayed. For example:



3. Select the name of the domain from **Domain**.
4. Select **Find**.

Natural Business Services returns a list of the business services in the specified domain. The following example shows the results of searching the Demo domain for all services:



You can also use this window to:

- Group the results by column

To group by column, drag the column heading to the shaded area

- Rearrange the columns

To rearrange the columns, drag the column heading to the far left of this window (for example, to sort by version, drag the Version heading to the left of the Domain heading)

5. Select the service for which you want to create a Web service.
6. Select **OK** to display the Web Service wizard.

You can refine the results by limiting the search as follows:

- Find Specific Services in All Domains
- Find a Specific Service in a Domain
- Use the Advanced Tab

Find Specific Services in All Domains

▶ To find specific business services in all domains:

1. Select **All** from Domain.
2. Do one of the following:
 - Type the name of a business service in **Service name** to return a list of all services in all domains with that name in their name

Note:

Ensure you use the correct case for Service name. For example, use “Calculator”, not “calculator”, to return a list of all services with Calculator in their name.

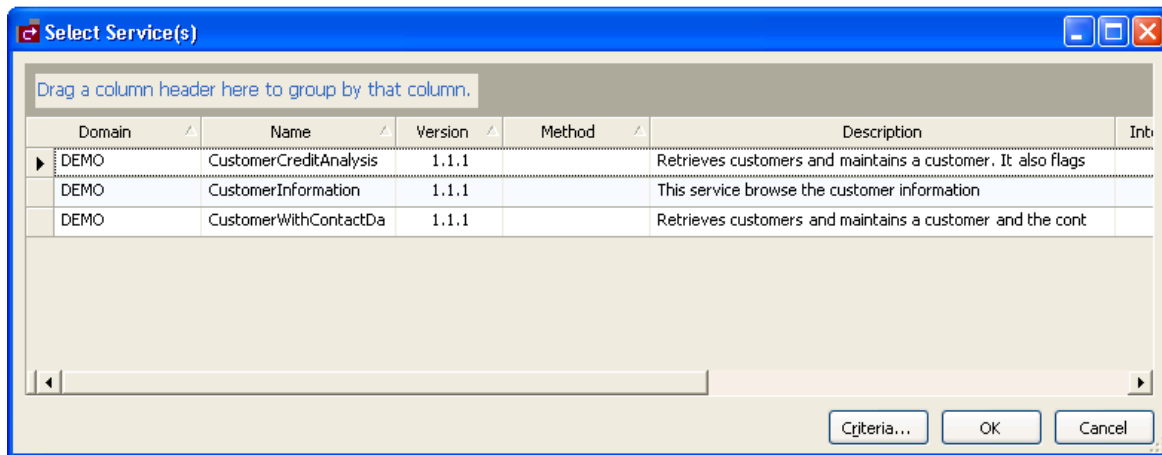
- Type a keyword in **Keyword(s)** to return a list of all services in all domains with that name in their descriptions

Note:

You can also use options on the Advanced tab to limit the search. For information, see Use the Advanced Tab.

3. Select **Find**.

Natural Business Services returns a list of all specified business services in all domains. The following example shows the results of searching all domains for a service containing “customer” in its description:

**Find a Specific Service in a Domain**▶ **To find a specific business service in a domain:**

1. Select the name of the domain from **Domain**.
2. Type the name of a business service in **Service name**.

Note:

Ensure you use the correct case for Service name. For example, use “Calculator”, not “calculator”, to find the Calculator service.

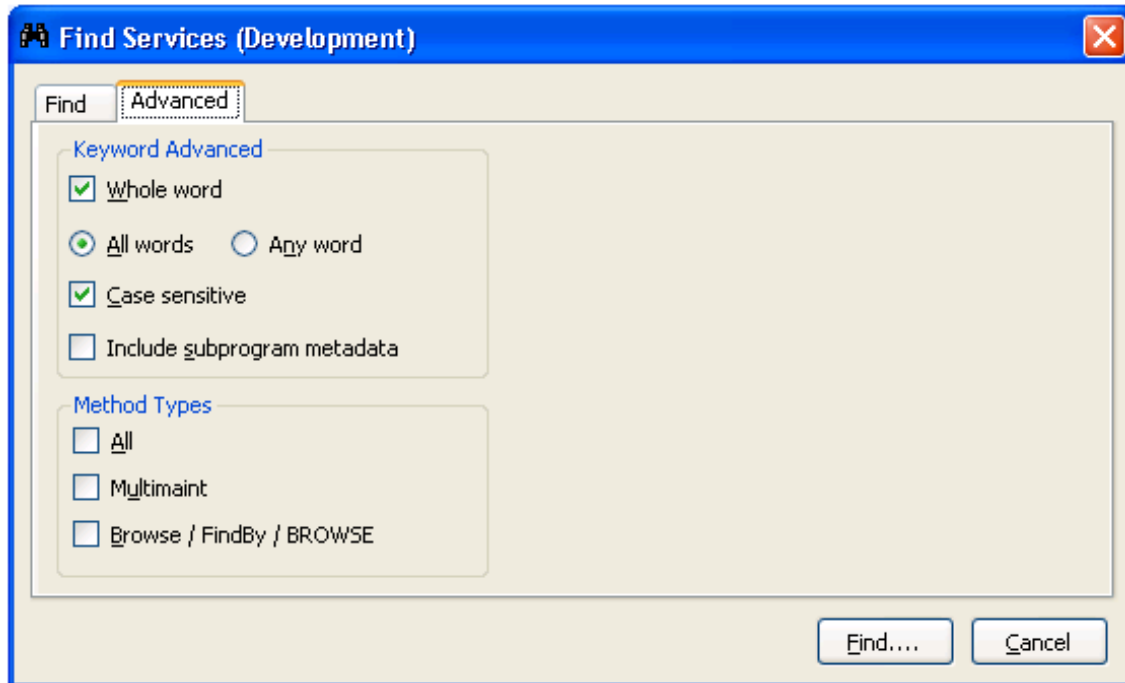
3. Select **Find**.

Natural Business Services returns a list of all business services in the domain with that name in their name.

Use the Advanced Tab▶ **To limit the search of business services:**

1. Type one or more keywords in Keyword(s).
2. Select the Advanced tab in the **Find Services** window.

The **Find Services window** is displayed. For example:



3. Select from the following search criteria:
 - Search for whole words only (for example, if you type “Customers” in **Keyword(s)**, business services containing “Customer” will not be returned)
 - Search for either all words specified in **Keyword(s)** or any word (for example, if you type “Customer record” in **Keyword(s)** and select All words on the Advanced tab, only business services containing both “Customer” and “record” will be returned)
 - Search for words using a particular case (for example, if you type “Customer” in **Keyword(s)** and select **Case sensitive**, business services containing “customer” will not be returned)
 - Search business services and their subprogram metadata for services containing the keyword specified in **Keyword(s)**
 - Search for business services containing one of the method types listed (for example, you can search for business services containing all method types, the multimaint method type, or the Browse, FindBy, or BROWSE method types)
4. Select **Find**.

Natural Business Services returns a list of all business services with the specified criteria.

Set Trace Options

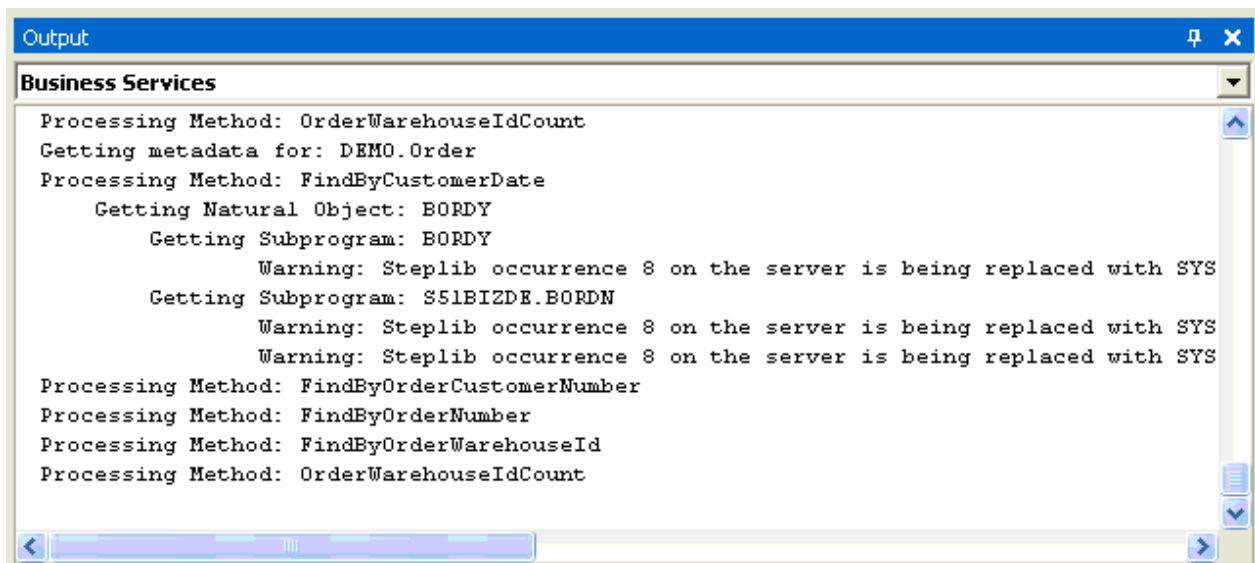
Select the Trace enabled option at the bottom of the Business Service Explorer to troubleshoot configuration and connection issues. This option records what is happening internally within the Visual Studio add-in and wizards. In addition, you can:

- Set the desired trace level (select the desired trace level from Level)
- Limit the items in the trace (select one or more items from Filter)

Note:

You can also enable the tracing options from the wizard panels.

The Visual Studio add-in will display runtime information in the standard Visual Studio **Output** window. For example:



The screenshot shows the Visual Studio Output window with the title bar 'Output'. The content area is titled 'Business Services' and displays the following trace output:

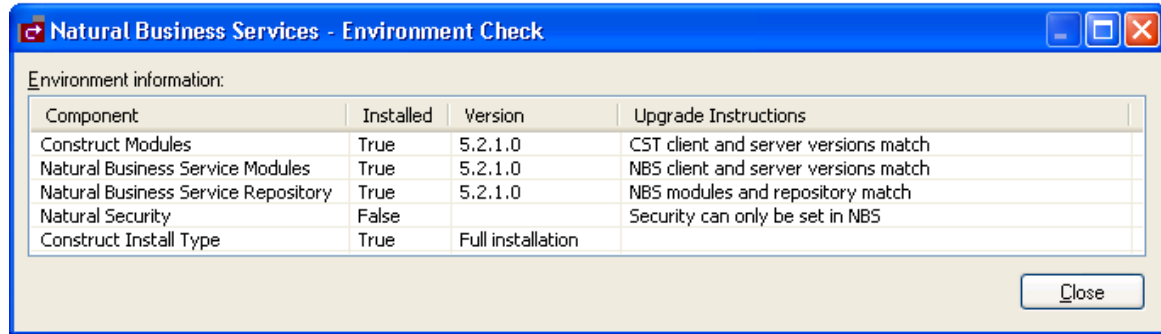
```
Processing Method: OrderWarehouseIdCount
Getting metadata for: DEMO.Order
Processing Method: FindByCustomerDate
    Getting Natural Object: BORDY
        Getting Subprogram: BORDY
            Warning: Steplib occurrence 8 on the server is being replaced with SYS
        Getting Subprogram: S51BIZDE.BORDN
            Warning: Steplib occurrence 8 on the server is being replaced with SYS
            Warning: Steplib occurrence 8 on the server is being replaced with SYS
Processing Method: FindByOrderCustomerNumber
Processing Method: FindByOrderNumber
Processing Method: FindByOrderWarehouseId
Processing Method: OrderWarehouseIdCount
```

Show Environment Information for a Connection

► To display environment information for a connection:

1. Open the context menu for a connection listed in the Business Service Explorer.
2. Select **Show environment** on the submenu.

The **Natural Business Services - Environment Check** window is displayed. For example:



This window displays information about the environment for the current connection.

3. Select **Close**.

Regenerate a Business Service from the Command Line

After using the Natural plug-in to create a business service, you can regenerate and compile an entire solution in Visual Studio from the command line using the following syntax:

```
Devenv.exe <solution name> /command "BusinessServicesAddIn.Connect.RegenSilent"
```

For example:

```
Devenv.exe s:\local\consoleapplication1\consoleapplication1.sln /command "BusinessServicesAddIn.Connect.RegenSilent"
```

The example above:

1. Loads the ConsoleApplication1 solution.
2. Retrieves all business services.
3. Regenerates the services.
4. Compiles the solution.
5. Closes Visual Studio.

Use Code Snippets

Code snippets are small pieces of code you can use in Visual Basic .NET. Natural Business Services supplies this code in the following folder:

```
<Install Folder>\Samples\VB\Code Snippets
```

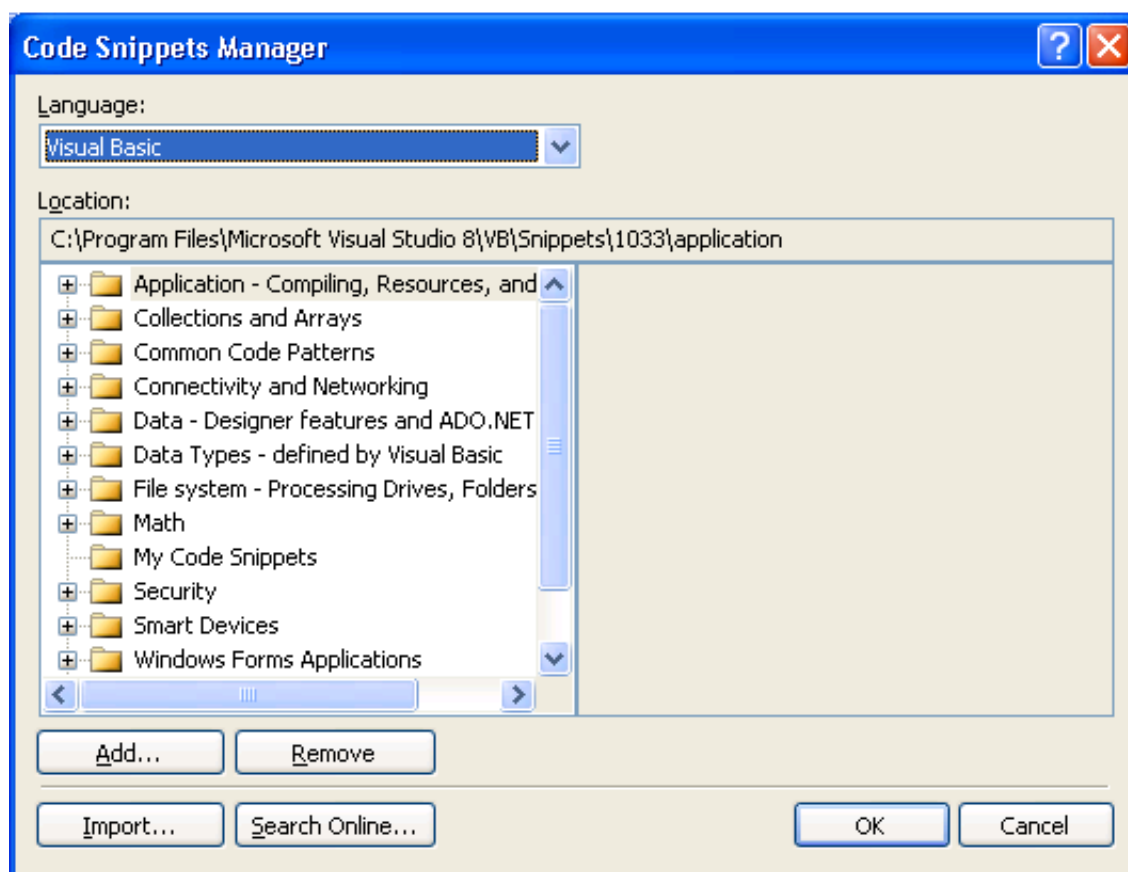
The code snippets supplied with Natural Business Services are:

Short Cut Name	File Name	Description
Displogon	Displogon.snippet	Log onto a dispatcher.
NBSdisp	CreateDispatcher.snippet	Create an IRemoteCaller (dispatcher) object.
NBSTest	TestService.snippet	Test a business service.

► **To add the code snippets to Visual Studio:**

1. Select **Code Snippets Manager** on the **Tools** menu.

The **Code Snippets Manager** window is displayed. For example:



2. Select **Add**.
3. Select **<Install Folder>\Samples\VB\Code Snippets**.
4. Select **OK**.

► **To invoke the code snippet:**

1. Type the short cut name in the Visual Studio code window.

2. Press Tab.

The code snippet is copied into the code window.

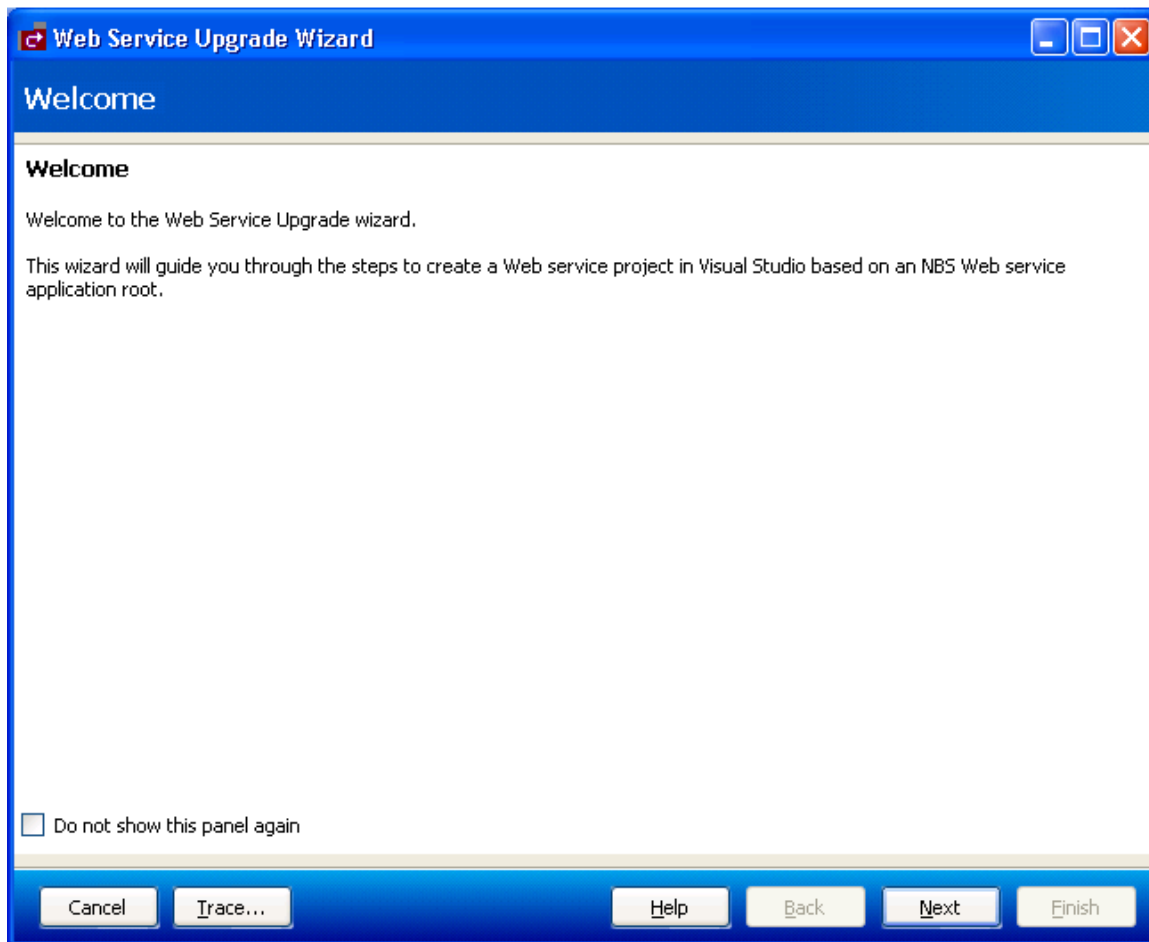
Upgrade an Existing Web Service

This section describes how to upgrade a Web service that was created using a previous version of Natural Business Services and import the service into Visual Studio.

► To upgrade and import existing Web services into Visual Studio:

1. Select **Upgrade existing Web services** on the **NBS** menu.

The Web Service Upgrade wizard is displayed. For example:



2. Select **Next**.

The following panel is displayed:

Web Service Upgrade Wizard

Enter information about the Web Service Application root.

i Enter information about Web service's root (Web services generated by NBS Workbench).

Folder: ...

Machine name:

Server path: (Example: /NBSDemos)

Port:

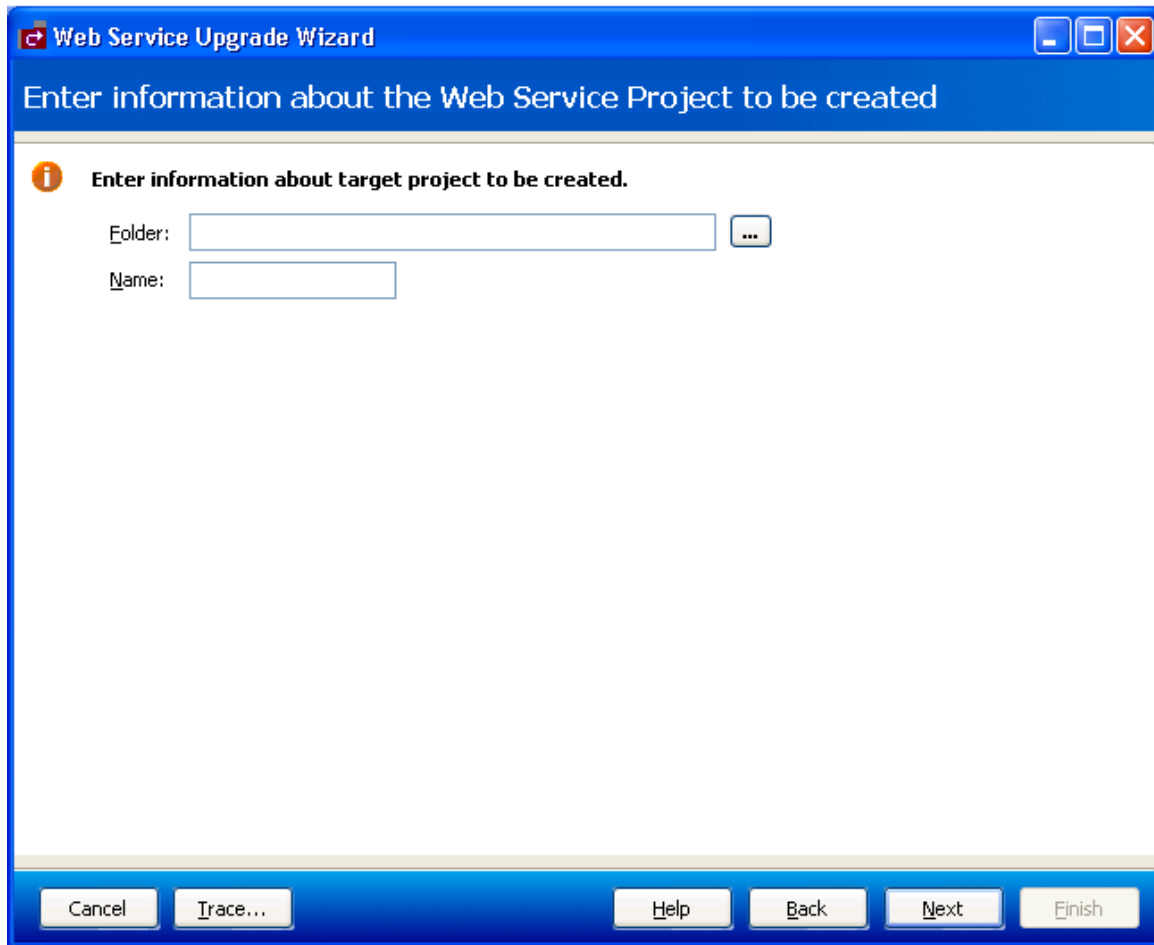
Cancel Trace... Help Back Next Finish

- Enter the following Web service root settings for the existing service:

Setting	Description
Folder	Root location of IIS. The default is c:\inetpub\wwwroot\. Note: If your services are in a different location, enter the location of the parent folder in this field.
Machine name	Name of the current machine or host. This value is used when creating the new Web service project. Note: The wizard will not connect to the remote machine; it only uses this name during the upgrading process.
Server path	Subfolder within the folder specified above; this is the Web service root.
Port	TCP/IP port number the web server is currently running on.

- Select **Next**.

The following panel is displayed:



The screenshot shows a Windows-style dialog box titled "Web Service Upgrade Wizard". The main heading inside the dialog is "Enter information about the Web Service Project to be created". Below this, there is an information icon (i) followed by the text "Enter information about target project to be created.". There are two input fields: "Folder:" with a text box and a browse button (...), and "Name:" with a text box. At the bottom of the dialog, there are five buttons: "Cancel", "Trace...", "Help", "Back", and "Next", and a "Finish" button on the far right.

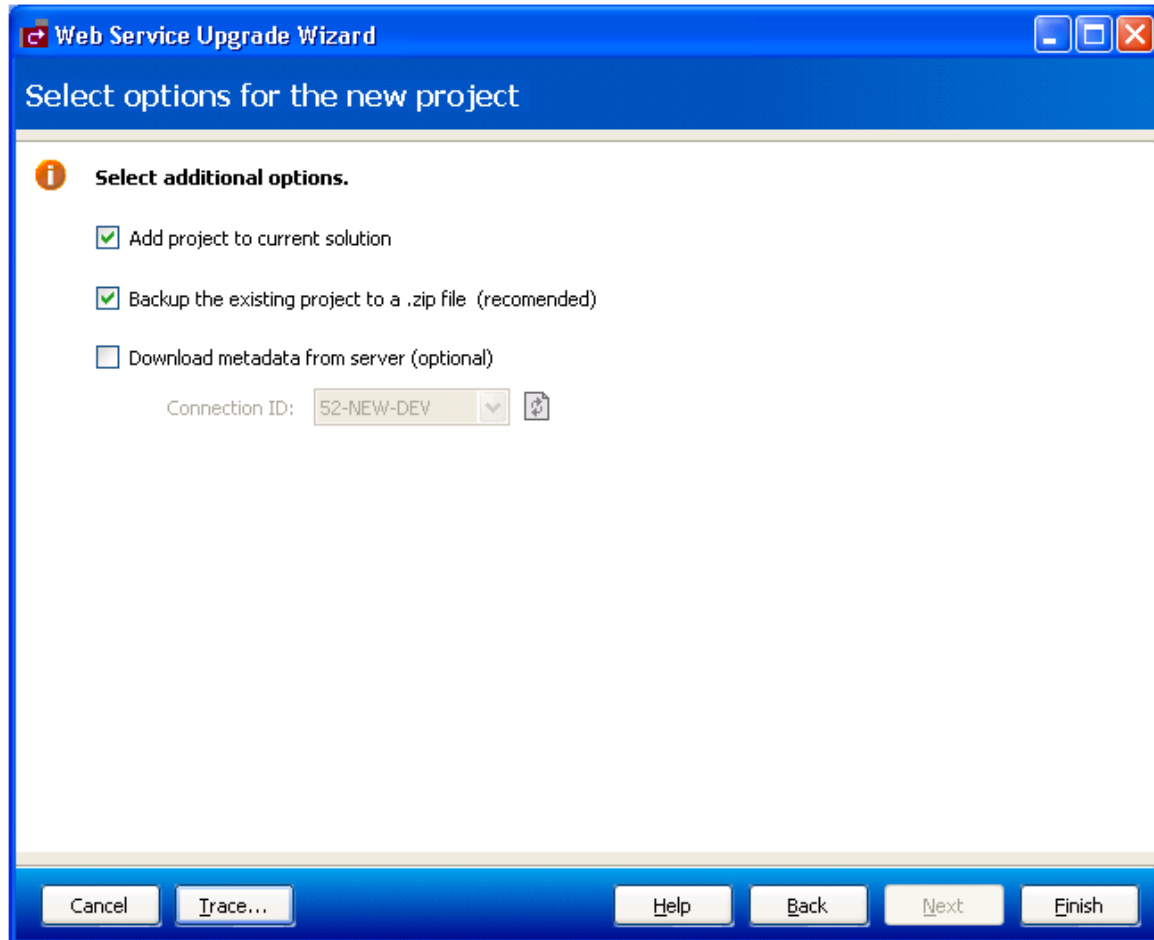
5. Enter the folder location and project name for the new project.

When naming projects, the following restrictions apply to the name:

- Cannot contain spaces
- First character must be alpha
- All other characters must be alphanumeric

6. Select **Next**.

The following panel is displayed:



7. Select any additional options for the new project.

These options are:

Option	Description
Add project to current solution	If this option is selected, the new project is added to other projects in the Solution Explorer.
Backup the existing project to a .zip file	If this option is selected, a backup zip file is created for the existing Web service folder. Note: We recommend that you select this option.
Download metadata from server	If this option is selected, metadata will be downloaded from the server for each service. Note: This option will significantly slow down the upgrade process.
Connection ID	This option is available when you select the Download metadata from server option. You can select a different connection and refresh the metadata.

8. Select **Finish** to upgrade the service.