Introducing SAP Enterprise Services Explorer for Microsoft .NET

Applies to:

SAP SOA, SAP NetWeaver® Composition Environment 7.1 including enhancement package 1,

SAP Services Registry, SAP - Microsoft interoperability, Microsoft Visual Studio 2005 and 2008.

For more information, visit the SOA Management homepage.

Summary

As part of its Service-Oriented Architecture (SOA) offering, SAP provides a set of consumer tools that allow discovering and consuming enterprise services from various development environments, such as NetWeaver Developer Studio, Visual Composer and Microsoft Visual Studio.
SAP Enterprise Services Explorer tool for Microsoft .NET (ES Explorer for .NET) is an add-in for Microsoft Visual Studio 2005 and 2008 that helps to leverage SAP SOA by enabling .NET developers to discover SAP enterprise services and consume them in their applications, as well as publish their own custom services. It is an important element of SAP – Microsoft interoperability.

This document provides an overview of the tool, its architecture, capabilities, and the two basis scenarios it supports.

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Author Bio

Anne Tarnoruder is part of the Knowledge Management & Enablement team of SAP NetWeaver Product Management in SAP Labs Israel, responsible for documentation of the development tools in the areas of .NET interoperability, Portal and Visual Composer.

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Introduction

SAP SOA is a foundation for an adaptable and open IT architecture used to develop service-based, enterprise-scale business solutions. SAP offers an enterprise services platform that allows customers, partners, and SAP experts to collaborate in building enterprise SOA.

Enterprise services are collections of closely-related Web services combined with business logic that together support a particular business process.

SAP Services Registry (SR) is a part of SAP NetWeaver Composition Environment 7.1 (CE), a UDDI-compliant registry of service definitions available in the repository. It provides API for search and discovery of services, as well as for publishing custom services in the registry, and supports the Web Service Definition Language (WSDL) standard.

ES Explorer for .NET is an add-in for Microsoft Visual Studio that enables .NET developers to discover enterprise services in the SAP Services Registry, and consume them in their applications. It helps to leverage SAP SOA and succeeds the SAP connector for Microsoft .NET (NCo) as the connectivity tool between SAP back-end systems and the Microsoft. NET platform.

Architecture and Workflow

Definition and Discovery

The following diagram illustrates the process in which SAP enterprise services are discovered and consumed in a Microsoft .NET environment with the help of ES Explorer.
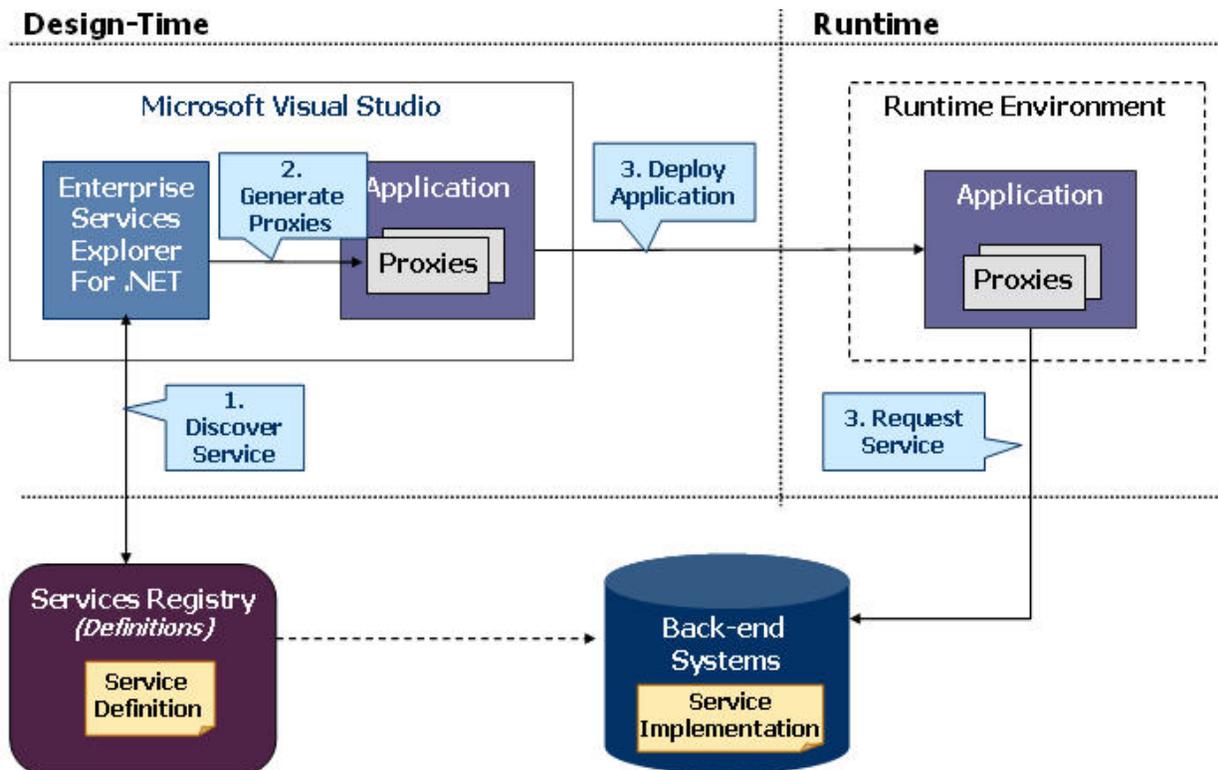
Enterprise services are implemented in the SAP back-end systems, and published into the Services Registry.

During application development, you discover services with the help of consumer tools, such as ES Explorer for .NET, and integrate them in your applications:

1. In Microsoft Visual Studio, launch ES Explorer for .NET to add a service reference to your project.

2. Set the parameters to search or browse the Services Registry for required services. ES Explorer invokes the discovery API of the Services Registry to perform a search based on these parameters, and retrieves service definitions (WSDL) and endpoints (actual service implementation addresses).

3. From the displayed list of retrieved services, select the service that you need. The selected service reference is added to your project.

ES Explorer invokes the standard Visual Studio mechanism to create Web service local proxies through which you consume the service in your code. At runtime, your application invokes actual services through these proxies.

Publishing

The following diagram illustrates the process of publishing custom Web services in the SR.

In this process:

1. The developer creates a custom Web service and deploys it to a local Web server.

2. ES Explorer retrieves the definition of the deployed Web service, enables the developer to define additional properties required by the SR, and publishes this service to the SR.

As a result, information about the custom Web service becomes publicly available in the SR for subsequent discovery and consumption in the client applications.
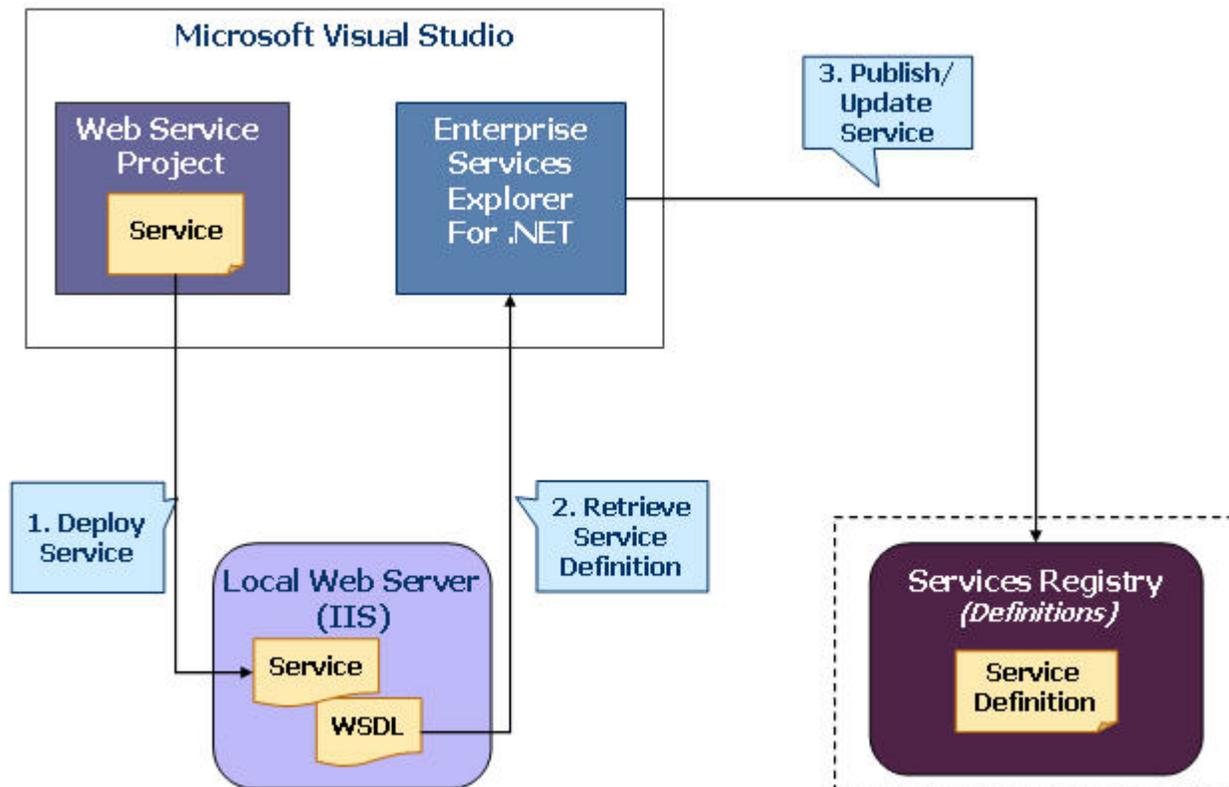
Features and Capabilities

- Connectivity to the SAP Services Registry

- Seamless integration with Microsoft Visual Studio

- Easy and intuitive wizard interface

- Service discovery and consumption capabilities

  o Consumption of the discovered services from any type of Visual Studio project

  o Automatic conversion of WSDL from SAP (Document style) to Microsoft (RPC style) standard

  o Standard Microsoft Web service proxy generation

  o No dedicated runtime support required – relies on Microsoft Web Services client

  o Supports proxy generation for Microsoft Windows Communication Foundation (WCF)

- Publishing of custom services

ES Explorer versus SAP Connector for .NET

ES Explorer for .NET is a successor of the SAP connector for .NET, a widely used tool for connecting the .NET platform to SAP back ends via a proprietary BAPI/RFC interface.

Although the SAP connector for .NET is fully supported by SAP (currently on Visual Studio 2003), and can also be used with Visual Studio 2005 with a workaround, ES Explorer for .NET represents a more advanced form of connectivity from the .NET platform to an SAP back end.

Using ES Explorer for .NET

The following section provides a quick guide to ES Explorer for .NET.

Prerequisites

- Microsoft Windows (XP/2003/Vista)

- Microsoft Visual Studio 2005 or 2008

- .NET Framework 2.0 or higher for the runtime environment

- Connection and credentials to the SAP Services Registry

- Connection and credentials to services in the SAP back-end systems (SAP ERP 2005)

- ES Explorer for .NET installed and configured

Installing and Configuring ES Explorer

To install ES Explorer, download and run the supplied installation wizard.

To configure ES Explorer, go to *Tools* -> *Options* -> *SAP ES Explorer*. To obtain the connection and authentication parameters for the Services Registry, as well as credentials for the back-end systems in which enterprise services are implemented, contact your system administrator.

For a quick start, you can also connect to the Services Registry provided by SAP on SDN. To do so, go to ES Workplace Configuration to obtain the connection and authentication parameters for the SR, and request a user account for the ES Workplace back-end systems.
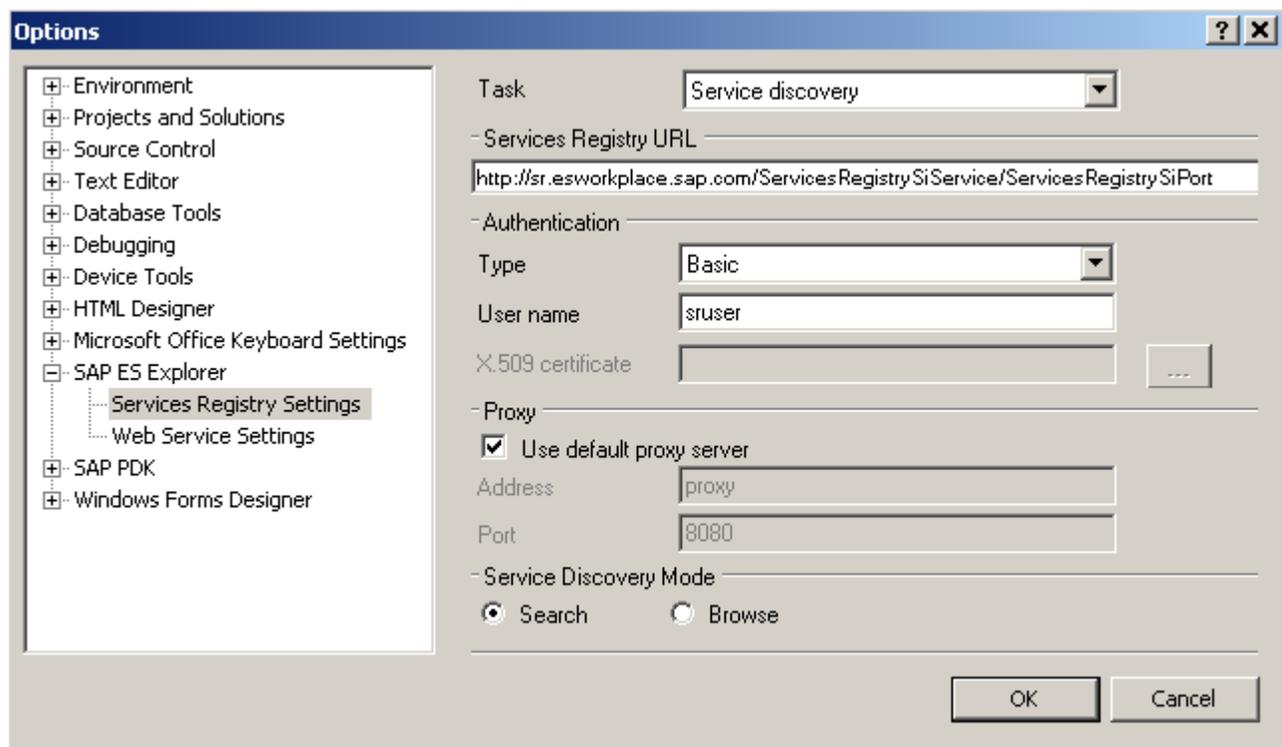
Discovering and Consuming Enterprise Services

To discover enterprise services in the Services Registry and consume them in your applications, right-click your Visual Studio project node in Solution Explorer and choose *Add SAP Enterprise Service…* from the context menu.
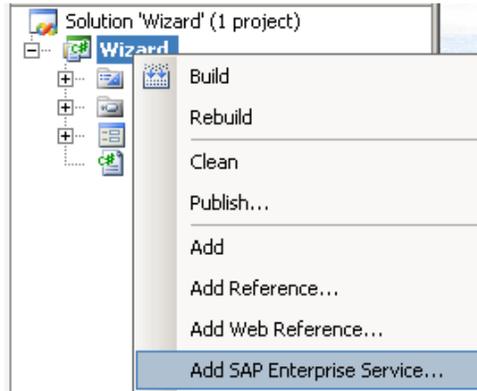
The *SAP Enterprise Services Explorer for Microsoft .NET* wizard opens. Follow the wizard instructions to discover the required service. To add more than one service, repeat the procedure for each service.

Logging On

In the *Log on to Services Registry* screen, provide your credentials for the Services Registry, and select either *Search* or *Browse* service discovery mode. The screen displays the default connection and authentication parameters that you have previously configured, but you can change them as required for the current session.
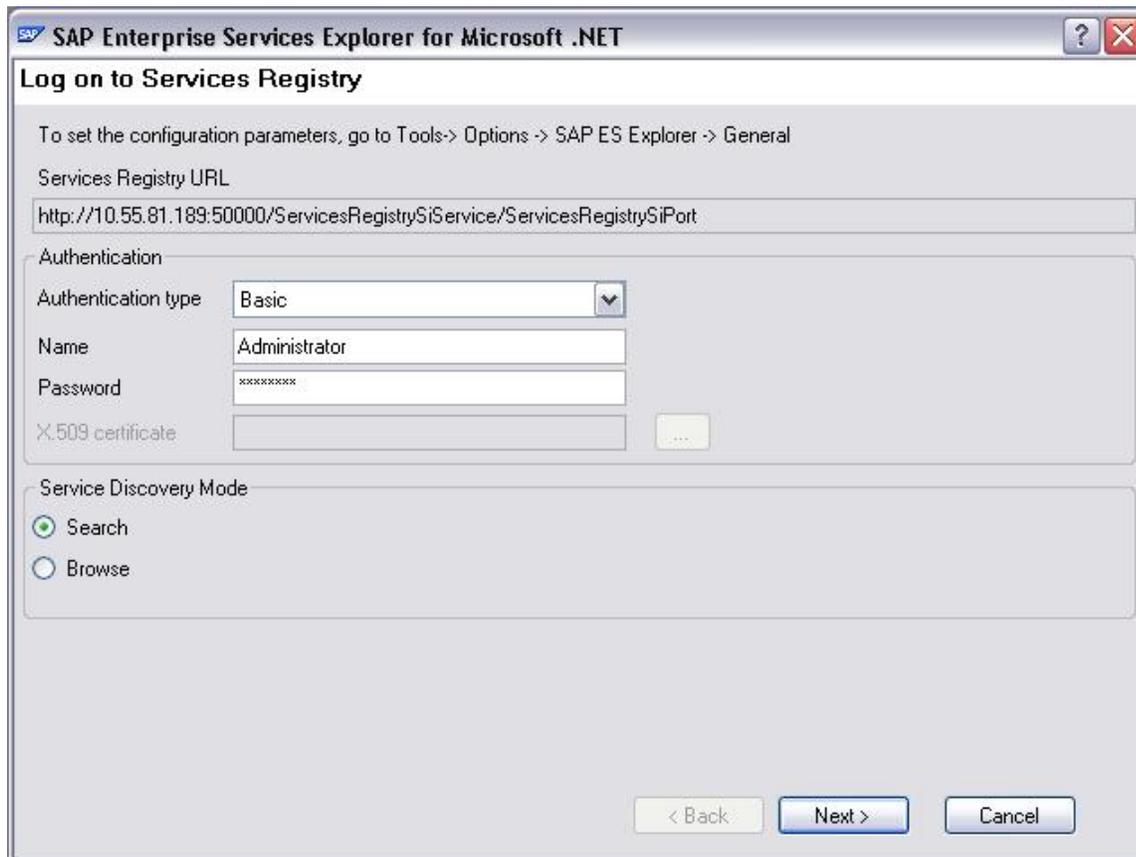
Searching

In the *Search Services Registry* screen, you can define search parameters and launch the search.

To narrow your search, you can set basic and/or advanced classification parameters, such as service state, physical system or classifications. Classification systems are used in the Services Registry to categorize services for the search. You can select multiple classifications for a single search.
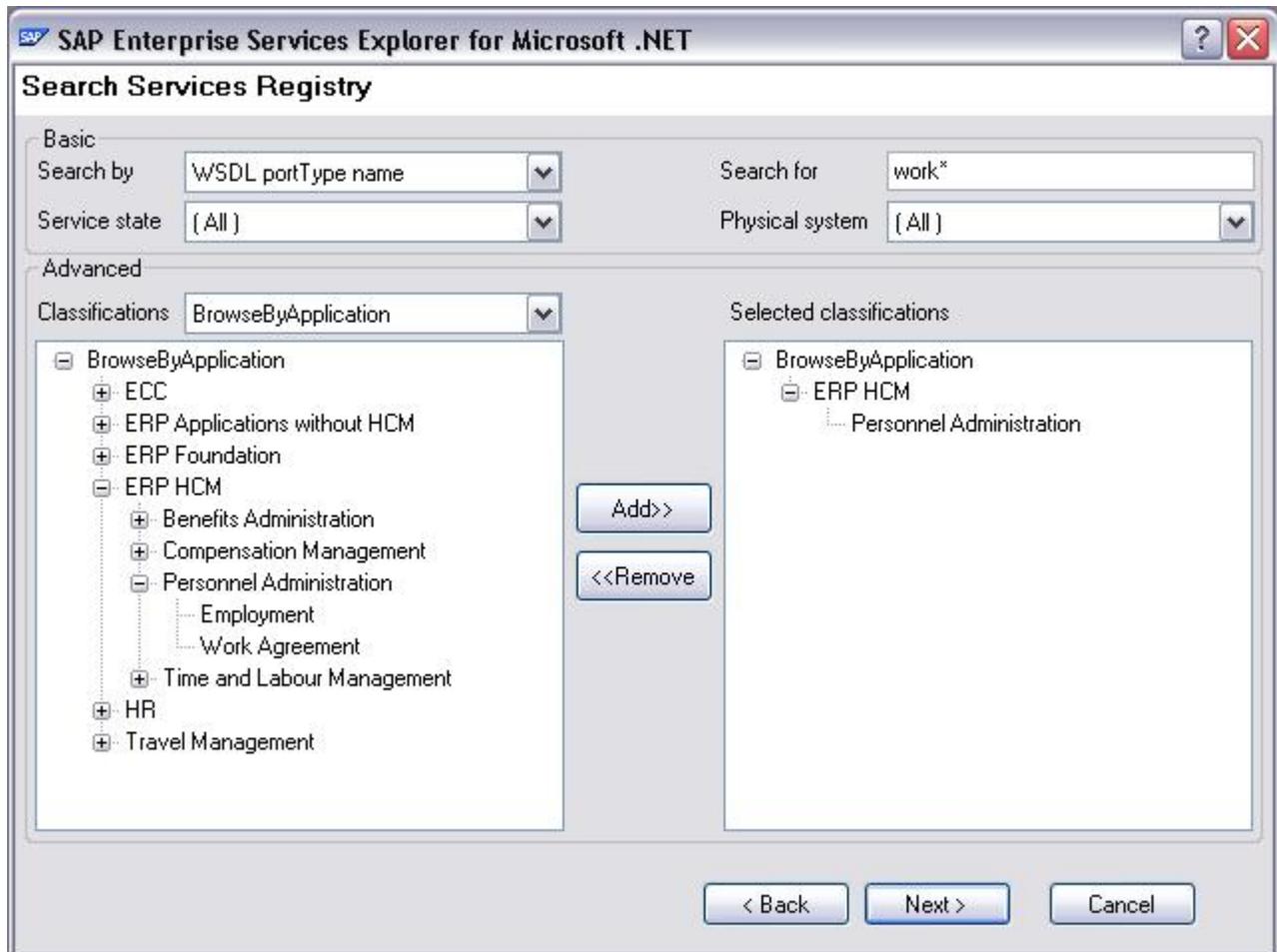
Selecting a Service

In the *Select Service* screen, you can browse through the search results displayed in the table, view detailed information about the services and, finally, select one of the available endpoints (implementations) of the service that you want to consume in your project.

If no endpoints are available for the currently highlighted service, you cannot reference it. In this case, you can only view the WSDL file in the browser by navigating to the *General* tab and clicking the WSDL URL link.

Browsing

In the *Browse Services Registry* screen, you can directly browse the Services Registry tree, view detailed information about each service, and select one of the available service endpoints.

To narrow the browsing scope, you can set filters by selecting classification systems and/or physical systems, where the services are implemented. The tree displays the classification hierarchy including actual services according to the filter. The tabbed area below the tree displays detailed information about the services.
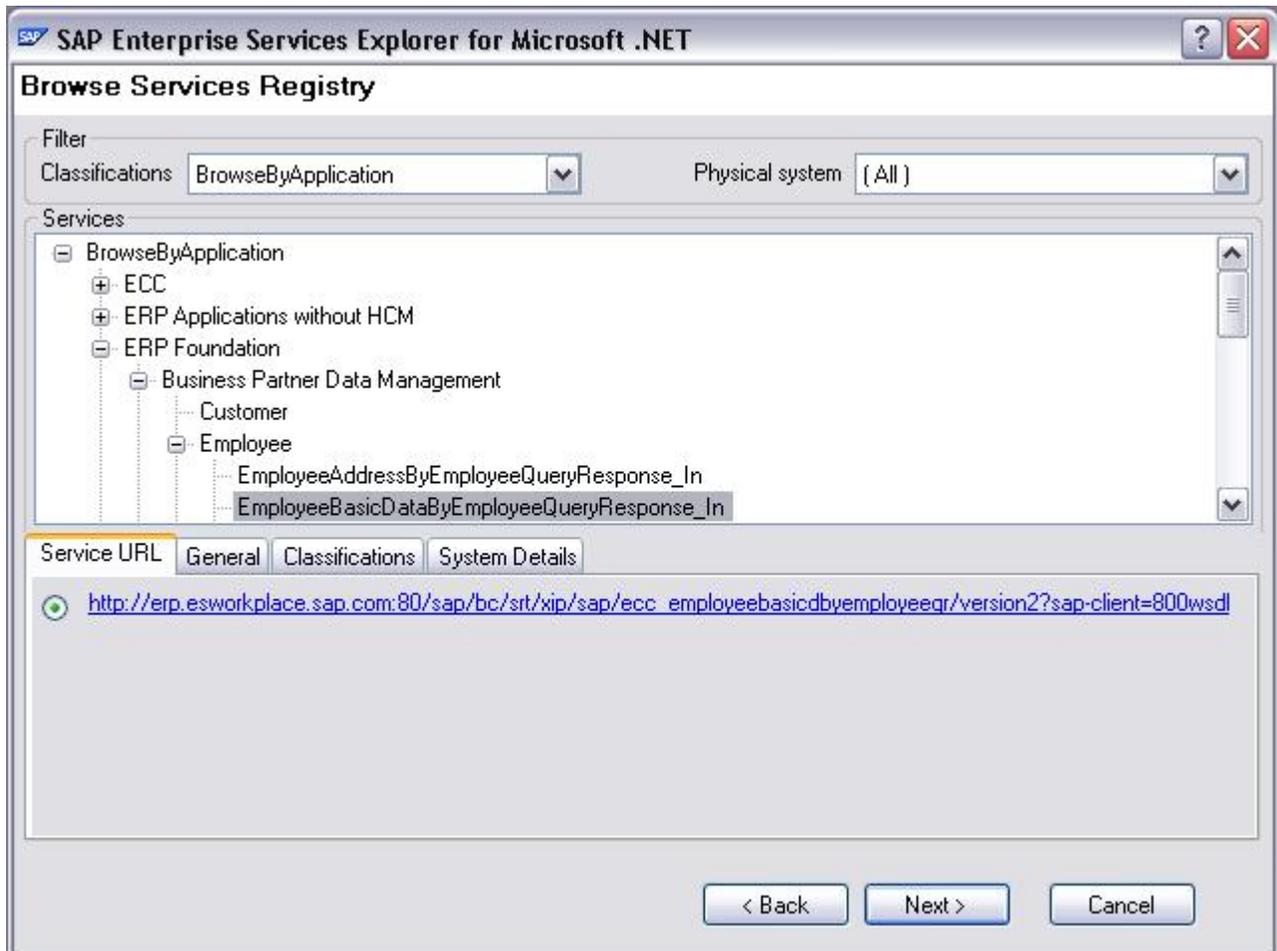
Adding a Service Reference

In the *Add Service Reference* screen, you can:

- View and confirm or reject selection of the service reference
- View the WSDL file in the browser by clicking the *Service endpoint URL* link
- Change the service reference name that will appear in you project

If WCF is installed on your machine, ES Explorer offers an option to generate WCF-compatible proxies. When you close the wizard, the service reference and local proxies to the selected service are created in your project.
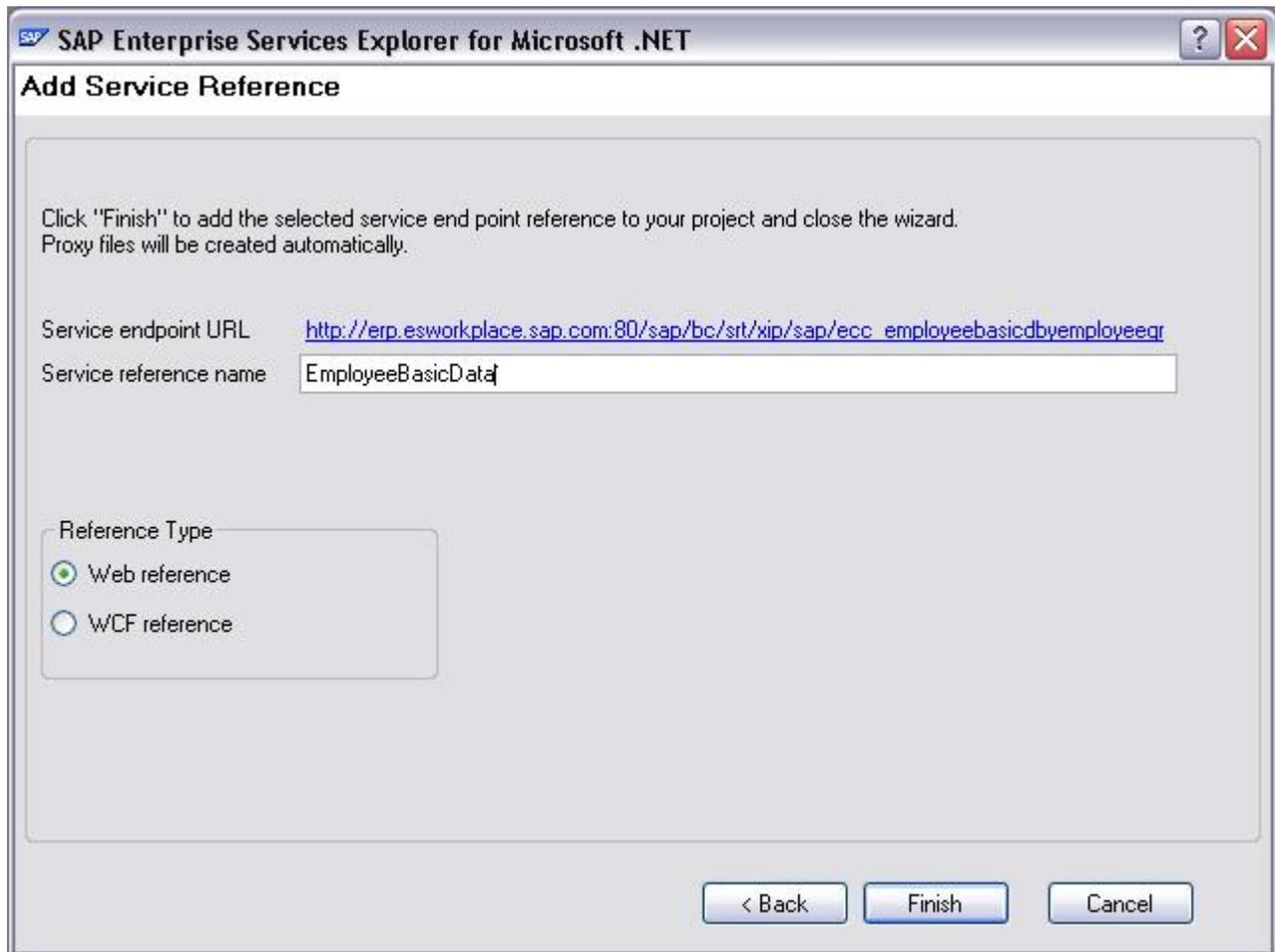
Consuming Enterprise Services

Now you can consume the services in much the same way as you would consume any other Web services.

You can discover and consume enterprise services in any type of Visual Studio applications, such as Windows Smart Client applications, Microsoft Office applications, Web (ASP.NET) applications or SAP NetWeaver Portal (PDK for .NET) applications.

Publishing Custom Web Services

To publish your own custom Web service in the SAP Services Registry in your organization, perform the following steps:

Developing and Deploying a Custom Web Service

Develop a custom Web service and deploy it on a local IIS server in your network.

Configuring ES Explorer

Define the default connection and authentication parameters for the SR in which you want to publish the service.
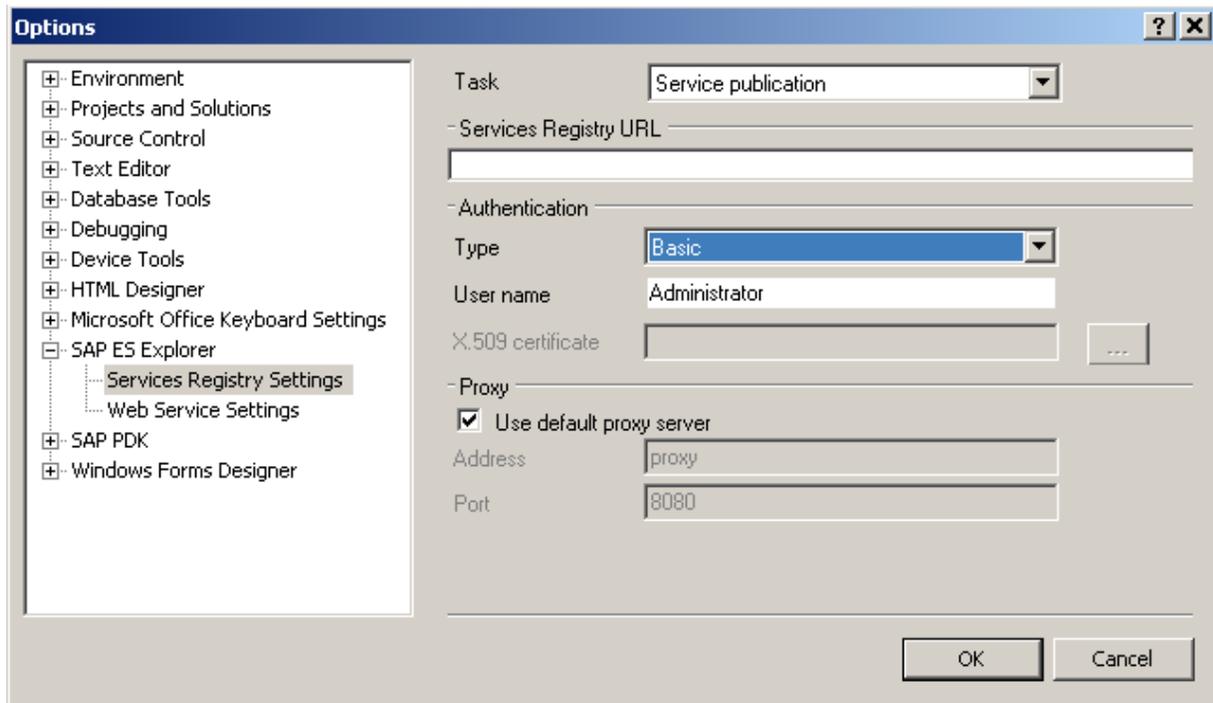
Define the default location in which you have deployed the service.
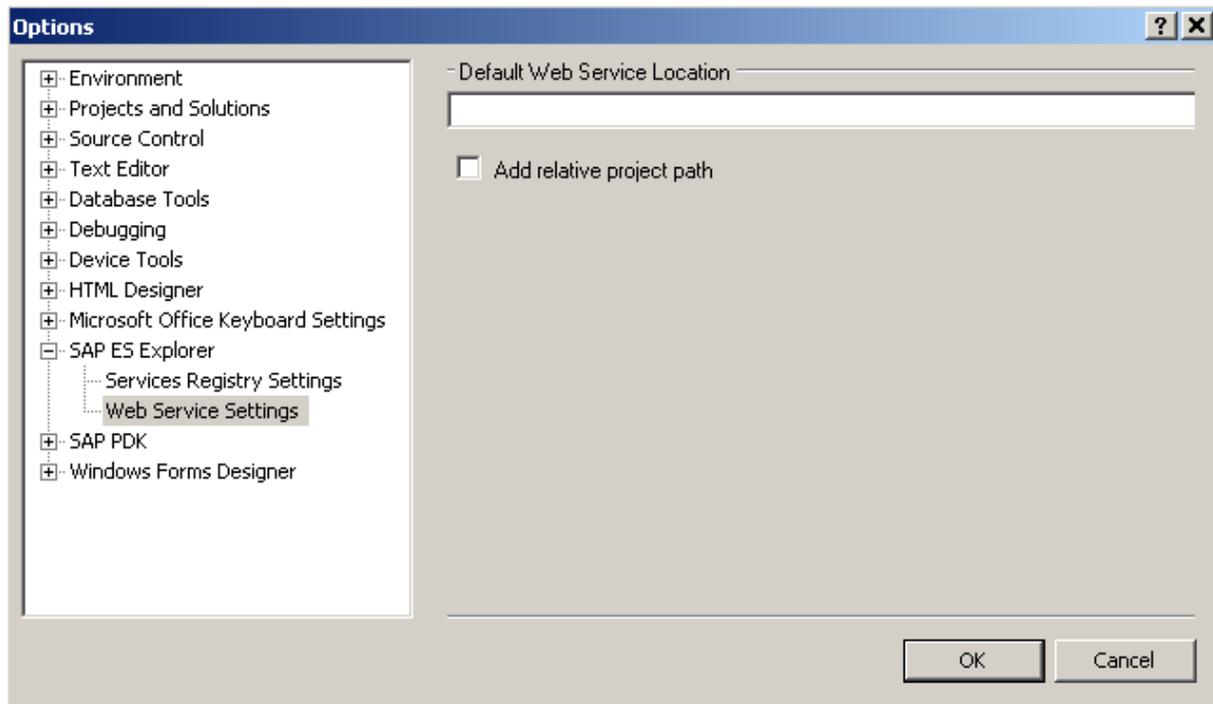
Starting the Wizard

In the context menu of your service in Solution Explorer, choose *Publish to SAP Services Registry....* to open the ES Explorer wizard.

Retrieving the Web Service Details

In the *Get Web Service Details* screen, you can:

- Modify the URL of the Web service you want to publish, if required
- View the service details
- View the service WSDL, if required

Logging on to the Services Registry

In the *Log on to Services Registry* screen, provide your credentials for the SR in which you want to publish the service. The screen displays the default connection and authentication parameters that you have previously configured, but you can change them as required for the current session.

Defining the Service Properties

In this screen (either *Publish New Service* or *Update Published Service*) you can view and specify some of the service properties that define its position in the SR and enable its subsequent discovery by consumers. Depending on whether the service you want to publish is new or already published, you create a new service record in the SR or update the existing one by adding its current deployment location as an endpoint.

Access the service properties in the following tabs:

- *General*: View and modify the general properties.

- *Classifications*: To facilitate discovery of your service, you can assign it to the existing SR classification groups.

- *Published Endpoints*: A list of published endpoints of your service. Each time you publish the same service to a different location, a new endpoint is added to the existing service record in the SR.

- *Physical System*: Properties of the physical system in the SR that matches the server on which your service is deployed.

Publishing the Service

In the *Publish Web Service* screen, review the summary information about the service you intend to publish and choose whether to complete the publishing process.
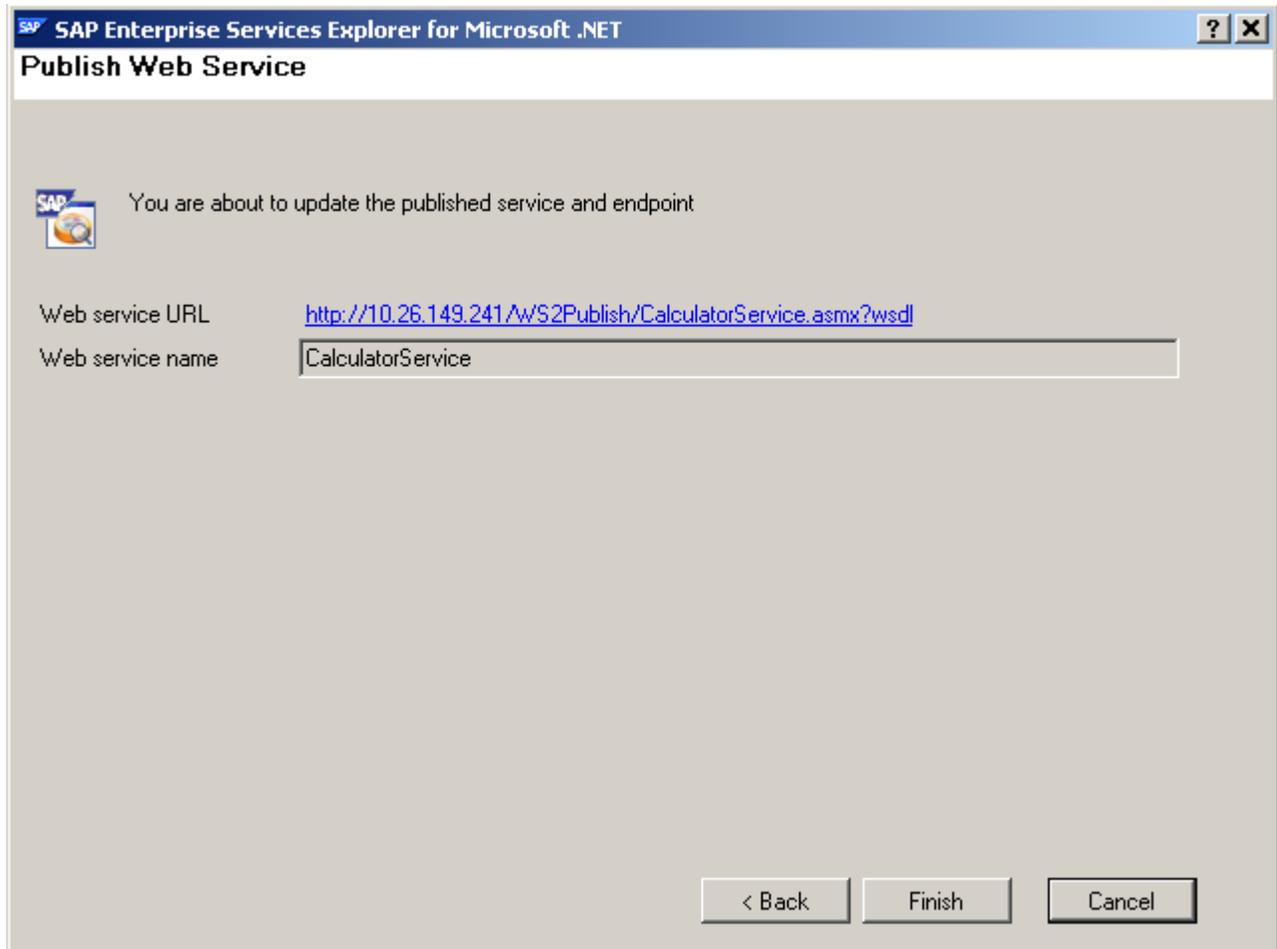
Related Content

Documentation

The documentation of ES Explorer, which includes detailed instructions and tutorials, is available in the Microsoft Visual Studio local help after installation. You can also press F1 in any of the ES Explorer screens to display context-sensitive help.

Other Resources

Explore Enterprise Services

Enterprise Services Workplace

.NET Interoperability

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