Integrate IBM API Connect and WebSphere Service Registry and Repository

Three strategies to strengthen your environment for the hybrid cloud

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Learn how you can use both IBM WebSphere Service Registry and Repository and IBM API Connect together for hybrid cloud integration, combining features to get optimum business value and strengthen your business.

The API economy is the transformation driven by connected devices and consumer thirst for compelling brand experiences. APIs act as the digital glue that links services, applications and systems by exposing enterprise services to consumers. At the same time, service-oriented architecture (SOA) is the widely adopted standard for managing services.

Move to the cloud with the Connect series from IBM

Discover, create, and publish APIs with your existing apps and data with the Connect series from IBM: IBM API Connect, an end-to-end API lifecycle management solution, is the glue that holds together the Connect series from IBM: IBM WebSphere Connect, IBM Business Operations Connect, IBM App Connect, IBM z/OS Connect, IBM DB2 Connect, and IBM Bluemix Data Connect. You can expose applications and data as APIs and connect to and from the cloud.

IBM® WebSphere Service Registry and Repository (WSRR) is a mature IBM SOA repository, designed to provide the governance and service management needed in organizations of all sizes. If you have been working with WSRR, you might wonder how to take the leap to exposing and managing APIs without losing the capabilities and familiarity you have in your WSRR environment.

IBM API Connect, a new API creation and management tool, is designed to simplify creating and managing consumer APIs.

This article explains how you can use both WSRR and API Connect together, using combined features to get optimum business value and strengthen your business. You learn three strategies for integrating WSRR and API Connect, so you can pick what is best for your applications and your business.
WSRR in business

Enterprises with focus and investment on SOA environments need an effective way to manage those environments, with a central point for making changes.

WSRR stores standardized service-based artifacts to model the services and the technical details of services that an enterprise owns. It holds all information about what services can do and how they can be invoked. The main focus of WSRR is on the service provider.

Semantic annotations and meta-data for the services can drive business insight about who can be a potential customer for the enterprise services. You can locate the services available to use and evaluate the affects of changes to the services.

WSRR brings business and IT teams together for process vitality and adapting to rapid market changes. It provides quality of service and ensures that every process and service is governed and mapped correctly, according to the needs of the enterprise.

API Connect in business

Fast growing organizations that are focused on exploring new revenue channels and new business opportunities, and organizations that can expose their services internally and externally, are the best candidates for a digital transformation.

API Connect as a platform helps businesses accelerate their digital transformation by providing a quick and agile way to create API definitions, manage API life cycles, and secure access to APIs. API Connect helps enterprise assets and capabilities to be discovered, reused and extended to make the most business value of what already exists. It enables enterprises to measure the value and the use of their exposed APIs, helping them create quick, new strategies for their business to evolve. The main focus of API Connect is on the consumers of APIs and what the enterprise is sharing with them.

API Connect can accommodate different environments based on your needs: on-premises, a cloud solution, or a hybrid cloud solution.

Understand the difference between consumers and providers, APIs and services

APIs are consumer-oriented, while services are provider-oriented. APIs are what your enterprise shares, while services are the systems of record that your enterprise has.

Consider the following definitions:

- A consumer is the user of a system of a record.
- A service is the provider of a system of a record.
- A consumer consumes a service of a provider.

The following figure shows examples of systems that consume APIs and provide services:
Bring together WSRR and API Connect

To get the most value for your enterprise, you can bring WSRR and API Connect capabilities together.

As you move toward an API economy for your organization and integrate WSRR and API Connect, focus on both the provider and consumer: manage both runtime services and design-time services. This article proposes three different integration strategies and describes the pros and cons of each strategy. You can assess what you have, and what you are trying to achieve.

First, make sure you understand the terminology of both WSRR and API Connect.

Consider the WSRR terminology in the following graphic:
The following table further explains the terms:

**Table 1. WSRR terminology**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>Used to group assets that have common stakeholder roles and require high degrees of collaboration. It can represent the whole enterprise structure in which is called an organization structure.</td>
</tr>
<tr>
<td>Business application</td>
<td>Represents either a business capability that is realized through a legacy application, or a particular channel to market realized by a web or portal application.</td>
</tr>
<tr>
<td>Application version</td>
<td>A specific version, or release, of a web application. The application version is only a consumer of services and therefore does not provide any services.</td>
</tr>
<tr>
<td>Business service</td>
<td>A business capability that is viewed as a service within the organization.</td>
</tr>
<tr>
<td>Service version</td>
<td>A specific version, or release, of a service that provides a range of functional and non-functional specifications that hold for that version of the service.</td>
</tr>
<tr>
<td>Service level definition (SLD)</td>
<td>The physical communication mechanisms, security and identity, used to deliver the messages for interaction with a provided service.</td>
</tr>
<tr>
<td>Service level agreement (SLA)</td>
<td>A specific dependency that a capability version has on a particular service level definition (SLD) provided by another service version.</td>
</tr>
<tr>
<td>Endpoint</td>
<td>A distinct deployment of a named service port, and provides the basic means of governing access to individual service endpoints.</td>
</tr>
</tbody>
</table>

Consider the API Connect terminology in the following graphic:
The following table further explains the terms:

**Table 2. API Connect terminology**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer organization</td>
<td>A collection developer responsible for the Applications that consume the APIs.</td>
</tr>
<tr>
<td>Application</td>
<td>The application that consumes the published APIs.</td>
</tr>
<tr>
<td>Product</td>
<td>Products provide a method by which you can group APIs into a package that is intended for a particular use. Products contain Plans.</td>
</tr>
<tr>
<td>Plan</td>
<td>A grouping that avails a collection of operations from one or more APIs for application developers to use.</td>
</tr>
<tr>
<td>API</td>
<td>A set of functions that provide some business or technical capability and that can be called by applications by using a defined protocol.</td>
</tr>
</tbody>
</table>

**Strategy one: impact analysis**

One of the unique aspects of WSRR is an end-to-end understanding of all the services that are running, from the application to the system of record. This level of information in one place allows you to conduct a detailed impact analysis, and reduce the time and risk of taking a service down for maintenance. For example, the following image shows that two applications call an **Account creation** service, which itself consumes an **Account eligibility** service.
You can configure WSRR to store the APIs as applications (or as their own object if you customize the profile). This configuration is manual but can be automated.

Storing the APIs in WSRR and referencing them to their dependent services allows impact analysis. As an additional step for smaller environments, you can register an application in WSRR through a manual or automated process.

**Strategy two: runtime enforcement and endpoint look up**

WSRR stores the endpoint information for the services, and you can determine which endpoint a particular application or API can use.

You can create a custom endpoint look-up module by creating a custom user-defined policy or GatewayScript/JavaScript policy. API Connect can query WSRR to ensure there is an service-level definition between the API and the service. Then, the endpoint is returned, which allows the API to invoke the endpoint. To ensure a minimum number of calls to WSRR, make sure to implement caching.

This strategy allows for the endpoints to be governed in WSRR. If your team decides that an API should use a different endpoint or service (for example, a new version) you can make changes in WSRR with no changes in API Connect. This strategy facilitates integrated management of the
API and service relationships and reduces the complexity of exposing your APIs to your back-end services.

**Strategy three: API and service SLA policy enforcement**

Commonly, organizations with WSRR environments use IBM DataPower® as a gateway for the enterprise service bus. API Connect includes DataPower, but many organizations use API Connect in front of the existing enterprise service bus.

DataPower can store and retrieve policies from WSRR. You can use these policies to set throttle policy for SLAs between the APIs and the services. For example, if you want to make sure that a specific endpoint does not get overloaded, or that you don't exceed an agreed SLA, use policies in WSRR. Note that these throttle policies work between the API and the service, not between the application and the API. (APIs are stored in the form of applications in WSRR.)

When the API is stored in WSRR, DataPower can determine, retrieve, and apply the policy from WSRR for the messages.

With this policy, you can set up additional protection against one API flooding requests to one service. If this strategy is not in place, a single API could overload a service and affect all SLAs provided from that service and the other APIs.

**Conclusion**

This article covered three strategies for using WSRR capabilities with API Connect. Review the strategies to help you decide on the best way to use WSRR with API Connect for your business.

If you already have a DataPower and WSRR integration for consumer applications with your enterprise service bus, consider all three strategies. For solutions that do not have an existing DataPower and WSRR runtime integration, consider using strategy 1 or 2.
Related topics

• WebSphere Service Registry and Repository product documentation
• Achieve your API Strategy with IBM API Connect
• WSRR Service Management Benefits for a Business Enterprise on the WSRR Developer Center
• Introducing the API Connect Getting Started Video Series on the API Connect Developer Center
• developerWorks Connect to Cloud

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