IBM i2 Information Exchange for Analysis Search Services SDK

Align and share information for visualization and analysis

Introduction

Investigative organizations must be better informed to minimize operational mistakes caused by errors and omissions in data. IBM understands that this can be challenging, not only for geographical, political and technical reasons, but also because of the quality and accuracy sometimes associated with available data.

IBM® i2® Information Exchange for Analysis Search Services SDK technology provides a simple method to align and share information for visualization and analysis. iXa Search Services is a Web services-based technology that allows users to make a single search across multiple data sources. It liberates your organization’s existing data and makes it readily available as information for analysis.

Using iXa Search Services you can:

- Provide one point of access for data sources, whether internal or external.
- Provide an intelligent search capability across multiple data sources, which trawls your data for the most relevant results.
- Provide one interface for data analysis that integrates with the de-facto standard analysis tool, IBM® i2® Analyst’s Notebook®.
- Enable your organization to share data with other communities in a controlled, consistent and security-rich environment.
• Align data from different sources despite differences in how the data is structured.
• Apply link analysis modeling to structured data to enable richer presentation and analysis.
• Provide data access to a distributed user community.
• Leverage existing investment in IBM i2 products.

iXa Search Services technology is specifically designed with multiple disparate data sources in mind. Complex, repetitive and time consuming searching of multiple data sources can become a thing of the past. iXa Search Services is able to harvest information from local, regional and global data sources, enabling more efficient and effective analysis.

Who should read this white paper
This paper provides a technical overview of iXa Search Services SDK. This overview enables technical managers, developers and system integrators to assess and understand how iXa Search Services can be deployed and used with the client IBM® i2® Information Exchange for Analysis Search for Analyst's Notebook (iXa Search AN).

Architecture
The three principal parts of the iXa Search Services architecture are:

• iXa Search Services client: The iXa Search Services client is any software which communicates with an iXa Search Services Web service using the iXa Search Services protocol. It offers commands to the user that permit queries of network data sources via Web service(s). IBM offers iXa Search Services clients, such as iXa Search AN, which is a plug-in to Analyst's Notebook.
• iXa Search Services Web service(s): An iXa Search Services Web service responds to iXa Search Services client requests. Its purpose is to interpret the client requests and query a data source to retrieve relevant results. It then sends a response that structures the retrieved data as useful information. Each iXa Search Services Web service can provide a level of security designed to meet the security requirements of the data source.
• iXa Search Services protocol: An iXa Search Services Web service implements the iXa Search Services protocol, the SOAP-based communication protocol between the iXa Search Services client and the iXa Search Services Web service. The protocol defines a client-server contract, including the operations that will be invoked by the client, and therefore must be exposed by the Web service. It also defines the structure of the SOAP messages passed between the client and Web service.

An important aspect of the iXa Search Services protocol is that it allows you to model the data that is retrieved from the data source so it is presented in a way that is beneficial to users. This feature relies on a data source schema, which is an XML file that you create using a tool that is provided with iXa Search Services SDK. The data source schema describes the data types of interest in the data source, and indicates how the returned data should be represented in the iXa Search Services client and in charts. The iXa Search Services protocol verifies the data source schema is provided by the Web service to the client each time a connection is established.
**iXa Search Services SDK**

iXa Search Services SDK provides the tools to develop an iXa Search Services Web service. It consists of:

- Schema Designer, which is a Windows application that helps you to build a data source schema and save it as an XML file.
- iXa Search Services Framework, which is a set of components that implement the iXa Search Services protocol. You can reference the supplied components to speed up the development of your Web service. Alternatively, you can use the API to develop replacement versions of some components.
- A comprehensive documentation set.
- Example Web services.
- The definition of the iXa Search Services protocol. This is provided as a Web Services Description Language (WSDL) file, and the XML Schema Definition (XSD) files referenced by the WSDL file.

**iXa Search Services deployment**

There are several phases to developing an iXa Search Services as illustrated below. The following sections discuss these phases in more detail and highlight what support is provided in the iXa Search Services SDK.
Goals and requirements
iXa Search Services SDK provides a comprehensive documentation set to help you effectively research and plan an iXa Search Services deployment that integrates smoothly into your enterprise, and meets the needs of your users.

Data source schema
You need to provide a data source schema for each data source exposed via iXa Search Services. A data source schema is a data model that describes the item types that represent the contents of your data source, and how items of these types should be displayed to the user. The schema describes the data that may be returned to the client in terms of entity and link types, e.g. People linked to Vehicles with an ‘Owns’ link, and the property types that describe their characteristics to aid visualization and analysis. Each iXa Search Services Web service requires at least one data source schema. iXa Search Services SDK provides Schema Designer to assist in constructing a data source schema and saving it as an XML file.

This application validates content and verifies that it conforms to the XML schema to help ensure that design requirements and best practices are met.

iXa SearchServices SDK documentation provides conceptual information about the purpose of the data source schema and best practices for how to construct one that meets the needs of your users.

Web service development
A simple way to develop an iXa Search Services Web service is to use the Web Services Framework supplied. The Framework is a set of Java components that support the operations defined by the iXa Search Services protocol. It provides a convenient architecture, with an API, that verifies the iXa Search Services protocol is implemented correctly and efficiently.

The Framework uses a central component, called Server Core, which manages the iXa Search Services protocol communications. This helps to eliminate the need for you to understand the nuances of the WSDL, SOAP, etcetera. Your task, as you develop the Web service, is to implement the required functionality using the supplied components and, optionally, the Framework API.

The supplied components are designed so that you can use them to achieve ‘out-of-the-box’ functionality for RDBMS data sources and speed up development of a Web service for non-relational, XML-based, data sources. If a supplied component does not meet your needs, you can use the provided Framework API to customize or replace it.
Understanding versioning
The iXa Search Services protocol is designed so that it may evolve over time and yet verify that existing Web services will be compatible with future clients, and vice versa. This is possible because the iXa Search Services protocol requires Web services to negotiate the protocol version that will be used for communications, before the connection is established.

This versatile negotiation process means that your Web service will be able to communicate both with existing and future clients that are provided by IBM, protecting your investment in your iXa Search Service deployment.

Documentation
The provided documentation set is designed to help you achieve a successful deployment. It helps to ensure you understand the goals, the XML content of the SOAP message exchanges, and the pre-requisites so you can achieve a successful deployment.

What documentation is provided?
iXa SearchServices SDK provides a comprehensive set of documentation, including:

Planning and Key Concepts Guide
Provides essential information about how to plan your iXa Search Services deployment. It also describes key concepts that we recommend you understand before you begin your Web service development.

This guide should be read before all other documents in the documentation set.

Framework Developer Guide
Describes the Framework architecture, the supplied components and how to customize or replace components. It finishes with a series of case studies.

This is mandatory reading for the Web service developer.

Framework Javadoc
Offers comprehensive reference information for the Framework API.

This is useful during Web service development.

iXa Search Services Protocol Developer Guide
Provides detailed information about the iXa Search Services protocol, and the content of the SOAP messages exchanged between the client and Web service.

This can be read during testing and debugging of the Web service, or by any developer who prefers to understand the details of the iXa protocol or is not using the Framework.

Information Exchange for Analysis Search for Analyst’s Notebook Client Administration Guide
Describes how to configure the iXa Search AN client for use with an iXa Search Services Web service.

We recommend you read this before you attempt to roll-out the client software and deploy your iXa Search Services solution.
What examples are provided?

A variety of Web services are provided to illustrate the use and behaviors of the components supplied in the iXa Search Services Framework. There are examples for both relational and XML data sources. The source code is provided as well as a packaged .war file that can be used to deploy the example Web service in a J2EE servlet container, such as Apache Tomcat. A readme file accompanies each example that describes the Web service features and how to deploy it.

Supported platforms and prerequisites

iXa Search Services SDK has been designed to install on a PC running a Microsoft Windows operating system.

It is possible to develop an iXa Web service for other server platforms that supports Web service development. These include, but are not limited to, supported platforms of J2EE Application Server.

An iXa Web service developed using the iXa Search Services Framework must be deployed to a server running a servlet container supporting the Java Servlet 2.4 specification. The container must be run in J2SE 5.0; previous versions of Java are not supported.

The iXa Search AN plug-in requires IBM® i2® Analyst's Notebook®.

IBM Professional Services

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