BusinessObjects Web Services SDK: An Overview

Parin Patel
October 3, 2007
Introduction

- Who am I?
  - Parin Patel - Senior Engineer, Customer Assurance Java Developer Support

- Goals: Provide overview of the Web Services SDK
  1) What Web Services are available with a specific version of Crystal/BusinessObjects Enterprise?
  2) What functionality is exposed with the Web Services SDK?
  3) What are some common similarities/differences between the Web Services SDK and the Crystal/BusinessObjects Enterprise SDK?
  4) What are the advantages/disadvantages of using the Web Services SDK?

- Prerequisites/Should know:
  - Web Services Technology
  - Crystal/BusinessObjects Enterprise Platform
CE/BOE Web Services SDK

- Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- BusinessObjects Enterprise XI R2 Platform Web Services
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
CE/BOE Web Services SDK

- Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- BusinessObjects Enterprise XI R2 Platform Web Services
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
CE/BOE Web Services SDK: CE10/BOE XI R1

- Web Services SDK first introduced with Crystal Enterprise 10
  - Apache Axis
  - Java and .NET Consumer API
  - Java Provider Web Application – *need Java App Server for deployment*
    - Uses the existing Java Enterprise SDK

- Available as a separate download called *Crystal Integration Pack*
- Included 3 web services:
  - Session Web Service
  - BICatalog Web Service
  - ReportEngine Web Service

- BOE XI R1 included the same services; no additional services added
Session Web Service

Similar to the `ISessionMgr` & `IEnterpriseSession` objects

<table>
<thead>
<tr>
<th></th>
<th><code>ISessionMgr</code></th>
<th><code>IEnterpriseSession</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Used to login</td>
<td>Represents a user’s Enterprise session</td>
<td>Used to logout of the Enterprise system</td>
</tr>
<tr>
<td>to the Enterprise system</td>
<td></td>
<td>Used to retrieve other services from the Enterprise system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Need to have a valid Session object in order to retrieve the other Web Services</td>
</tr>
</tbody>
</table>
## Session Web Service

### Method Summary

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>void</code></td>
<td></td>
</tr>
<tr>
<td><code>changePassword(String oldPassword, String newPassword)</code></td>
<td>Change the current user's password.</td>
</tr>
<tr>
<td><code>java.lang.String[]</code></td>
<td></td>
</tr>
<tr>
<td><code>getAssociatedServicesURL(String serviceName)</code></td>
<td>Return an array of strings containing the URL's associated to the web service.</td>
</tr>
<tr>
<td><code>SessionInfo</code></td>
<td></td>
</tr>
<tr>
<td><code>login(Credential credential)</code></td>
<td>Open a Web Services session by providing full Enterprise Credentials.</td>
</tr>
<tr>
<td><code>void</code></td>
<td></td>
</tr>
<tr>
<td><code>logout()</code></td>
<td>Log out of a Web Services session.</td>
</tr>
</tbody>
</table>
CE/BOE Web Services SDK:
CE10/BOE XI R1

- **BICatalog Web Service**
  - Used to retrieve, search and sort documents, folders and categories

<table>
<thead>
<tr>
<th>Method Summary</th>
</tr>
</thead>
</table>
| **Category[]** | **getCategoryList**(java.lang.String objectUID, int depth, SortType[] sort, java.lang.String[] resourceRightNames, java.lang.String[] objectPropertyNames)  
  The getCategoryList method returns an array of Categories available to the current user. |
| **Document[]** | **getDocumentList**(java.lang.String objectUID, int depth, SortType[] sort, java.lang.String[] resourceRightNames, java.lang.String[] objectPropertyNames, InstanceRetrievalType instanceRetrievalType)  
  The getDocumentList method returns an array of Documents available to the current user. |
| **Folder[]** | **getFolderList**(java.lang.String objectUID, int depth, SortType[] sort, java.lang.String[] resourceRightNames, java.lang.String[] objectPropertyNames)  
  The getFolderList method returns an array of Folders available to the current user. |
CE/BOE Web Services SDK: CE10/BOE XI R1

- ReportEngine Web Service
  - Used to get different views of a document (CR, Webi, FullClient/Deski):
    - BinaryView: PDF, Excel, RTF, Word
    - CharacterView: HTML
    - XMLView: XML
CE/BOE Web Services SDK: CE10/BOE XI R1

- ReportEngine Web Service
  - Don’t have a *CrystalReportViewer* class, but you do have all the pieces to build your own viewer
    - Prompting for and entering database logon & parameter values
    - Handling drill down actions with subreports and groups
    - Displaying images in the report
  - Navigation
  - Etc.
ReportEngine Web Service

Method Summary

<table>
<thead>
<tr>
<th>DocumentInformation</th>
<th>getDocumentInformation(java.lang.String documentReference, RetrieveMustFillInfo retrieveMustFillInfo, Action[] actions, Navigate navigate, RetrieveData retrieveData)</th>
</tr>
</thead>
</table>

The getDocumentInformation method returns a DocumentInformation corresponding to a unique ID (UID) or document reference.

- RetrieveMustFillInfo
  - "That which is not requested is not retrieved"

- Actions
  - Performing actions on a document (refreshing, drilling, etc.)
CE/BOE Web Services SDK

- Crystal Enterprise10/BusinessObjects Enterprise XI R1
- **BusinessObjects Enterprise XI R2**
- BusinessObjects Enterprise XI R2 Platform Web Services
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
CE/BOE Web Services SDK: BOE XI R2

2 new Web Services

- Session Web Service
- BICatalog Web Service
- ReportEngine Web Service
- Publish Web Service
- QueryService Web Service
CE/BOE Web Services SDK: BOE XI R2

- Publish Web Service
  - Used to add, copy, delete and update documents to/from Enterprise
  - Can publish Word, PowerPoint, Excel and PDF documents
  - Can’t publish CR, WebI or Deskl documents
## Publish Web Service

### Method Summary

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>add</code></td>
<td>Creates a new resource (such as a PDF) in the specified folder.</td>
</tr>
<tr>
<td><code>copy</code></td>
<td>Copies a resource to the destination folder or category.</td>
</tr>
<tr>
<td><code>delete</code></td>
<td>Removes a resource from the BusinessObjects Enterprise deployment.</td>
</tr>
<tr>
<td><code>move</code></td>
<td>Moves a resource to the destination folder or category.</td>
</tr>
<tr>
<td><code>update</code></td>
<td>Updates a resource.</td>
</tr>
</tbody>
</table>

### Method Details

- **add**(java.lang.String objectUID, ResourceInfo resourceInfo)
  - Updates a resource.
CE/BOE Web Services SDK: BOE XI R2

- QueryService Web Service
  - Retrieve list of Universes
  - Retrieve list of Universes in a document
  - Create and execute queries based on a Universe
### QueryService Web Service

#### Method Summary

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>DataProviderInformation</code></td>
<td><code>createDataProvider(java.lang.String dataSourceUID, QuerySpecification querySpecification, ReturnProperties returnProperties)</code>&lt;br&gt;The <code>createDataProvider</code> method is used to create a query (specified by the <code>QuerySpecification</code> parameter).</td>
</tr>
</tbody>
</table>
| `DataProviderInformation`                   | `getDataProviderList(java.lang.String documentReference, boolean includeQuerySpecification)`<br>The `getDataProviderList` method provides the list of `DataProviderInformation` objects for the document identified by `documentReference`.
| `DataSource[]`                              | `getDataSourceList()`<br>The `getDataSourceList` method provides the list of data sources on which you can perform a query. |
CE/BOE Web Services SDK

- Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- **BusinessObjects Enterprise XI R2 SP2 Platform Web Services**
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
CE/BOE Web Services SDK: BOE XI R2 Platform Web Services

- 3 main pain points with the CE/BOE Web Services SDK

  1) Can’t retrieve a complete list of InfoObject properties like we can with the Enterprise Query Language 😞

  2) No admin features such as scheduling, managing users/servers, publishing CR documents, etc. 😞

  3) No CrystalReportViewer; you have the pieces, but you have to put them together on your own
In Q2 2006, we released the BOE XI R2 Platform Web Services SDK

**ONLY SUPPORTED WITH BOE XI R2 SP1**

This update addressed 2 of the 3 pain points mentioned:

1) Can’t retrieve a complete list of InfoObject properties like we can with the Enterprise Query Language
   - The addition of a new *Query Language* and *Enterprise Plugins* 😊

2) No admin features such as scheduling, managing users/servers, publishing CR documents, etc.
   - The addition of the BIPlatform Web Service 😊

3) No *CrystalReportViewer*; you have the pieces, but you have to put them together on your own
   - Still no *official* viewer control, but you can create your own (see demo 😊)
Path Query Language

Similar to the Enterprise Query Language, you can access the 3 Enterprise categories/hierarchies:

1. InfoObjects (CI_INFOOBJECTS) – documents, folders, objects
2. AppObjects (CI_APPOBJECTS) – universes, connections
3. SystemObjects (CI_SYSTEMOBJECTS) – users, servers, groups
CE/BOE Web Services SDK: BOE XI R2 Platform Web Services

Path Query Language

4 types of queries

1) Path Query (path://[Root Hierarchy]/[Base Folder]/folder1/folder2/.../MyReport)
   ▶ path://InfoObjects/Root Folder/Report Samples/General Business/

2) CUID Query (cuid://<general_business_cuid>/World Sales Report)

3) Search Query (search://{Sales}?SearchName=true&SearchCaseSensitive=true)

4) Enterprise Query Language (query://{SELECT SI_NAME FROM CI_INFOOBJECTS WHERE SI_KIND='CrystalReport'}

Paging

▶ Can retrieve objects in pages

Refer to Developer Library for detailed documentation

▶ Web Services Developer Guide -> SDK Fundamentals
CE/BOE Web Services SDK: BOE XI R2 Platform Web Services

Enterprise Plugins

- With our Enterprise SDK, we have the ability to use classes known as *plugins* to retrieve specific information from objects in the Enterprise system.
- Added several of the common plugins we are used to seeing with the standard Enterprise SDK:
  - CrystalReport
  - Destination
  - Folder
  - FullClient
  - Inbox
  - InfoObject
  - InfoObjects
  - SchedulingInfo
  - Server
  - ServerGroup
  - User
  - UserGroup
CE/BOE Web Services SDK: BOE XI R2 Platform Web Services

- BIPlatform Web Service
  - Use the Path Query Language to retrieve InfoObjects
  - Used for admin and management functionality
    - Scheduling
    - Publishing (yes, you can publish CR docs unlike the Publish Service)
    - Server Management: start/stop/restart servers and server groups
    - User Management
  - Supersedes the BICatalog and Publish Web Services; the BIPlatform should be used instead.
CE/BOE Web Services SDK: BOE XI R2 Platform Web Services

- BIPlatform Web Service
  - Similar to the *IInfoStore* object

<table>
<thead>
<tr>
<th>IInfoStore</th>
<th>BIPlatform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query the CMS Database for InfoObjects</td>
<td>✔️</td>
</tr>
<tr>
<td>Update InfoObjects in the CMS Database</td>
<td>✔️</td>
</tr>
<tr>
<td>Delete InfoObjects from the CMS Database</td>
<td>✔️</td>
</tr>
<tr>
<td>Schedule documents</td>
<td>✔️</td>
</tr>
<tr>
<td>Send objects to a specified destination</td>
<td>✔️</td>
</tr>
</tbody>
</table>
# CE/BOE Web Services SDK: BOE XI R2 Platform Web Services

## BIPlatform Web Service

<table>
<thead>
<tr>
<th>Method Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Method</strong></td>
</tr>
<tr>
<td>void</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>int</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ResponseHolder</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ServerMetrics</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>InfoObjects</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>void</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
CE/BOE Web Services SDK

- BusinessObjects 6.5/Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- BusinessObjects Enterprise XI R2 Platform Web Services
- **BusinessObjects Enterprise XI R2 SP2**
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
In addition to some bug fixes, BusinessObjects Enterprise XI R2 Service Pack 2 added some new features to the Web Services SDK:

- Windows Active Directory Single-Sign On (SSO) – *only with .NET API*
- Serialized ConnectionState object
- A new Web Service: SaveService
  - perform save/saveAs operations on WebI & DeskI documents
- Updates to the ReportEngine & QueryService Web Services

Refer to the Developer Library for more information on the SP2 updates.
CE/BOE Web Services SDK

- Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- BusinessObjects Enterprise XI R2 Platform Web Services
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
## CE/BOE Web Services SDK: Summary

<table>
<thead>
<tr>
<th></th>
<th>CE10</th>
<th>BOEXI R1</th>
<th>BOEXI R2</th>
<th>BOEXI R2 Platform WS</th>
<th>BOEXI R2 SP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BICatalog</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>ReportEngine</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Publish</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>QueryService</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BIPlatform</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Path Query Language</td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>SaveService</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
## CE/BOE Web Services SDK: Advantages/Disadvantages

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>➤ Ease of integration: no added firewall configuration</td>
<td>➤ Performance; serialization/de-serialization process overhead</td>
</tr>
<tr>
<td>➤ Easier to share BI services between companies and departments</td>
<td>➤ No CrystalReportViewer control (but you have all the pieces to build your own)</td>
</tr>
<tr>
<td>➤ One SDK to manage/view Crystal Report, Web Intelligence and Desktop Intelligence documents</td>
<td>➤ Don’t have access to Report Creation and Modification API (RCAPI) via Report Application Server (RAS) SDK</td>
</tr>
<tr>
<td>➤ Supported SDK for thick-client applications</td>
<td></td>
</tr>
<tr>
<td>➤ Administrative functionality:</td>
<td></td>
</tr>
<tr>
<td>➤ Scheduling</td>
<td></td>
</tr>
<tr>
<td>➤ User/Security/Server management</td>
<td></td>
</tr>
<tr>
<td>➤ More flexible/intuitive query language: 4 types</td>
<td></td>
</tr>
<tr>
<td>➤ WS.NET SDK supports XCOPY deployment</td>
<td></td>
</tr>
</tbody>
</table>
CE/BOE Web Services SDK

- Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- BusinessObjects Enterprise XI R2 Platform Web Services
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
Demo

- Code Review: Scheduling – BOE SDK vs WS SDK

- AJAX HTML Web Services CrystalReportViewer
  - [http://diamond.businessobjects.com/node/2279](http://diamond.businessobjects.com/node/2279)
CE/BOE Web Services SDK

- BusinessObjects 6.5/Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- BusinessObjects Enterprise XI R2 Platform Web Services
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
Additional Resources

- BOE Platform Web Services SDK Release Notes

- Diamond Community Web Site
  - http://diamond.businessobjects.com

- Online Developer Library Documentation
  - http://diamond.businessobjects.com/developer/library

- Technical Support Site
  - http://support.businessobjects.com/
CE/BOE Web Services SDK

- BusinessObjects 6.5/Crystal Enterprise10/BusinessObjects Enterprise XI R1
- BusinessObjects Enterprise XI R2
- BusinessObjects Enterprise XI R2 Platform Web Services
- BusinessObjects Enterprise XI R2 SP2
- Advantages/Disadvantages
- Demo
- Additional Resources
- Questions
Questions