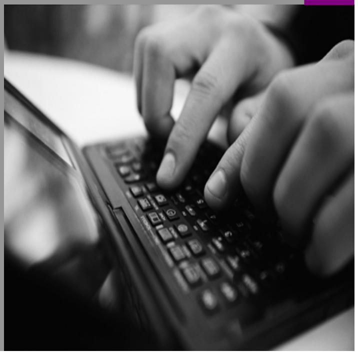
How-to Guide
SAP NetWeaver ‘04



How To… Use the BI Java SDK in a J2EE Application

Version 1.01 – July 2005

Applicable Releases:
SAP NetWeaver ’04

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1 Scenario

You want to build a Java application that performs analytics on data in an XMLA provider and displays this data in a J2EE application deployed to the Web Application Server. You use the BI Java SDK to custom build this application and you establish the connection with the BI XMLA Connector. All you need for this scenario is included in SAP NetWeaver ’04.

2 Introduction

This document provides detailed instructions on how to use the BI Java SDK and its BI Java Connectors in a J2EE application. It contains step-by-step instructions for creating a servlet that uses the BI XMLA Connector to connect to a BW system.

In this document, we focus on the procedure for establishing a connection in the J2EE environment. After you establish this connection, refer to the tutorials and documentation for the BI Java SDK to expand upon your scenarios.

Although the screenshots in this document depict the process using the SAP NetWeaver Developer Studio, note that you can use the Java development tool of your choice to create the sample servlet.

3 The Step By Step Solution

In the first section below you prepare your system, and in the second section you create your servlet.

3.1 Prepare the System

To prepare the system, you first look up the JNDI name of your connector in the J2EE Visual Administrator, and then configure the connection properties.

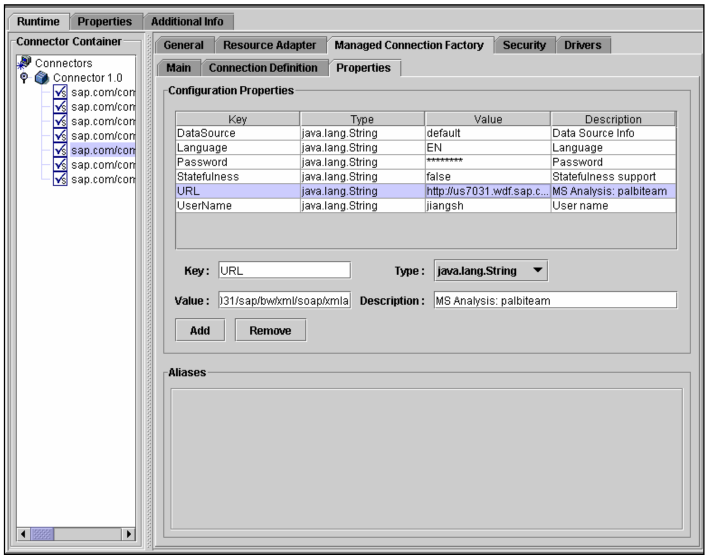
In this example, we use the BI XMLA Connector to connect to an SAP BW system and retrieve a list of schemas.

Use the J2EE Visual Administrator to determine the JNDI name of the BI XMLA Connector:

1. Select *<server node>* → *Services*→ *Connector Container*.
2. On the *Runtime* tab, in the *Connector Container* section, locate the entry for the BI XMLA Connector, `sap.com/com.sap.ip.bi.sdk.dac.connector.xmla.BI_SDK_XMLA`, and double-click it to open the connector definition.
3. Select *Managed Connection Factory* → *Connection Definition* and locate the JNDI name in the *Connector JNDI name* field.

   For the BI XMLA Connector, this is *SDK_XMLA*.

Configure the connection properties using the J2EE Visual Administrator:



Key	Type	Value	Description
DataSource	java.lang.String	default	Data Source Info
Language	java.lang.String	EN	Language
Password	java.lang.String	********	Password
Statefulness	java.lang.String	false	Statefulness support
URL	java.lang.String	http://us7031.wdf.sap.c...	MS Analysis: palbiteam
UserName	java.lang.String	jiangsh	User name

Key : URL
Type : java.lang.String
Value :)31/sap/bw/xml/soap/xmla
Description : MS Analysis: palbiteam

4. Still in on the *Managed Connection Factory* tab, select the *Properties* tab and set the required connection properties as shown to the right.

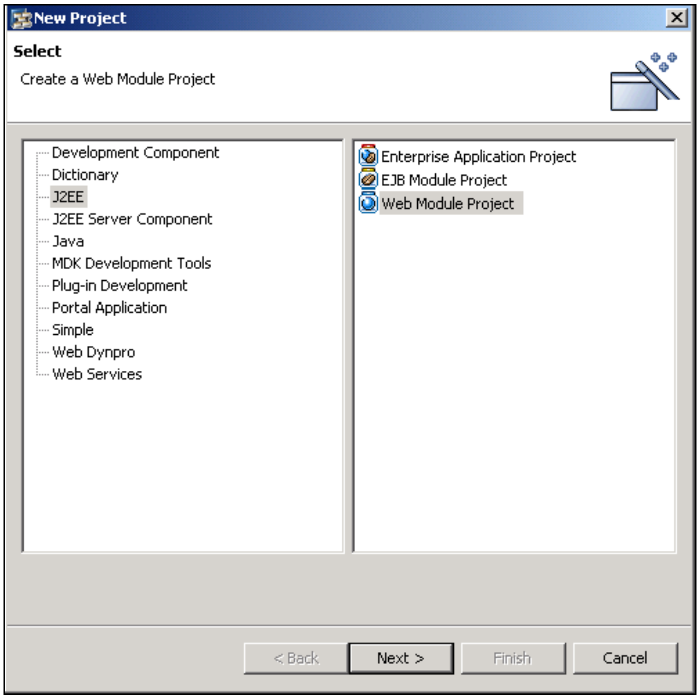
   Refer to the documentation for the BI XMLA Connector in its howto.html file or in the BW Installation Guide for information on the properties.

Property	**Setting**
DataSource	default
Statefulness	false
Language	EN
Password	(password)
UserName	(username)
URL	http://server:port/sap/bw/xml/soap/xmla

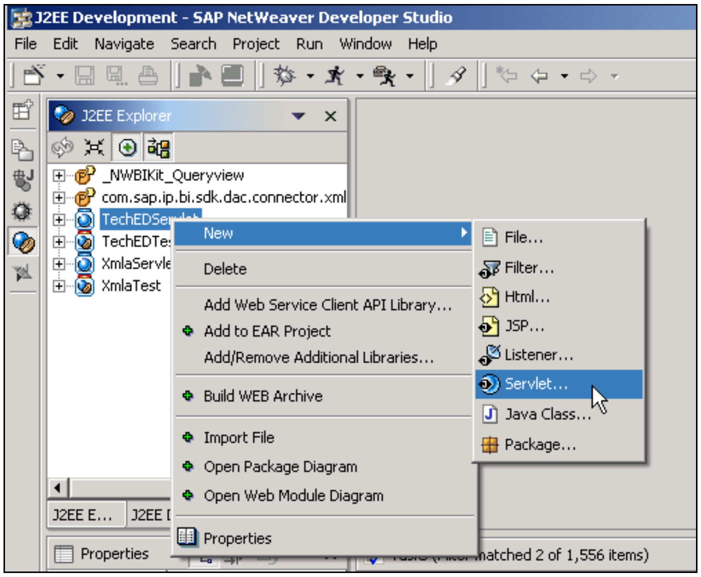
5. Save the settings.

3.2 Create the Sample Servlet

6. In the SAP NetWeaver Developer Studio, use the *New Project* wizard to create a Web Module Project.

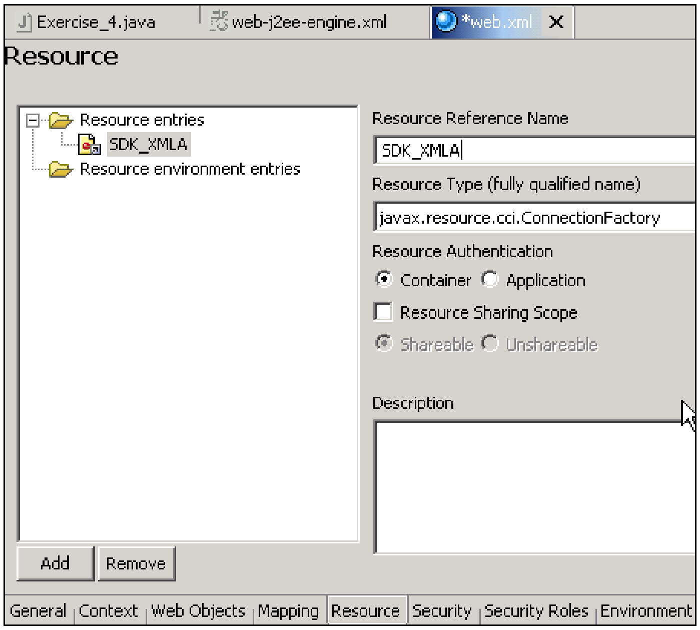


7. In the *J2EE Explorer*, right-click on the new Web Module project, and select *New* → *Servlet* from the context menu to create a new servlet component.



Edit the servlet's web.xml file to add a resource reference to the BI XMLA Connector:

8. In the J2EE Explorer, double-click the web.xml file listed under your Web Module project, and select the *Resource* tab.
9. In the *Resource Reference Name* field, enter the JNDI name for your connector (see Step 3, above).
10. From the *Resource Type* drop-down list, select *javax.resource.cci.ConnectionFactory*.



Resource Reference Name: SDK_XMLA

Resource Type (fully qualified name): javax.resource.cci.ConnectionFactory

Resource Authentication: ● Container ○ Application

☐ Resource Sharing Scope

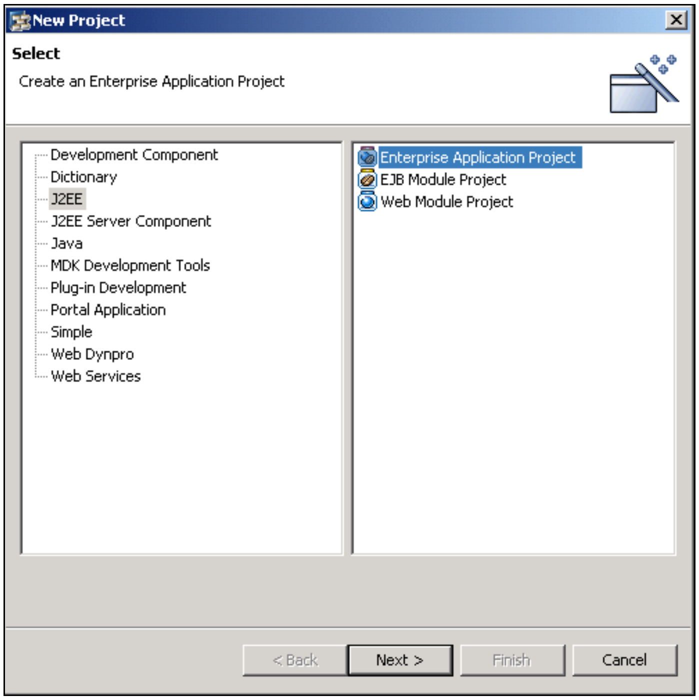
● Shareable ○ Unshareable

11. In the servlet's source code, look up the XMLA Connection Factory by its JNDI name, and establish the connection using the default connection properties. Use the code below to get connection and retrieve schemas.

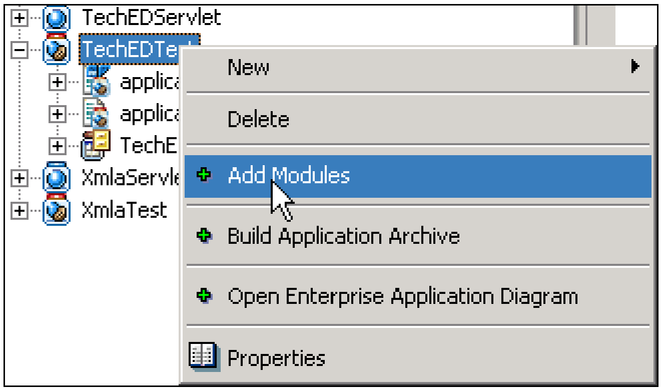
    Note: The BI Java SDK libraries are required to compile this scenario, and can be found in *<your NetWeaver Developer Studio installation folder>\eclipse\tools\bi_sdk\bi_sdk.zip*, or can be downloaded from the SAP Developer Network at http://www.sdn.sap.com/.

```
IConnectionFactory connectionFactory = null;
IConnectionSpec connectionSpec = null;
IBIConnection connection = null;

Context initctx = new InitialContext();

// perform JNDI lookup to obtain connection factory
connectionFactory =
  (IConnectionFactory) initctx.lookup(
    "java:comp/env/" + "SDK_XMLA");

// get connection using default connection properties
connection =
  (IBIConnection) connectionFactory.getConnectionEx(null);

IBIOlap olap = ((IBIConnection) connection).getOlap();

List schemas = olap.getSchema();

connection.close();
```

12. In the *New Project* wizard, create a new J2EE Enterprise Application Project.

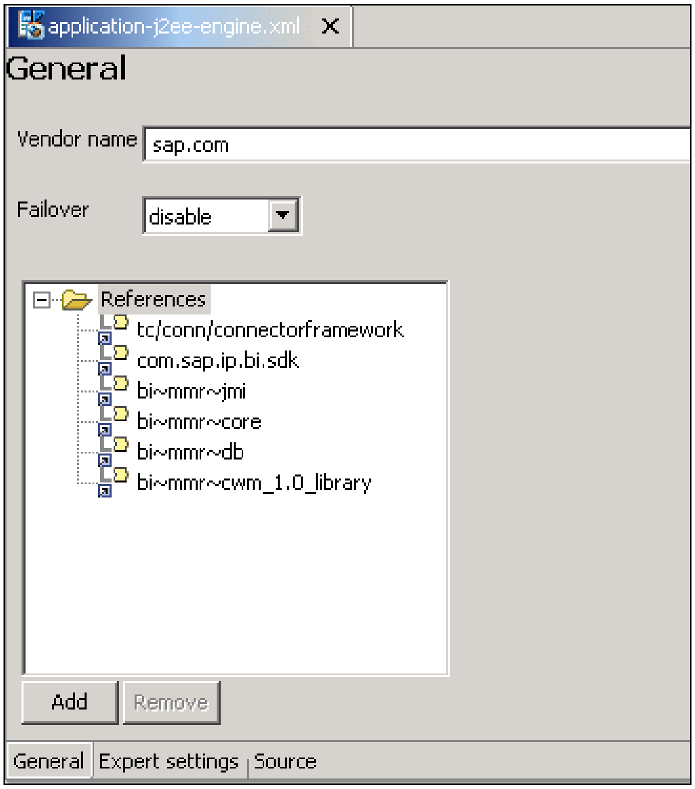


13. In the *J2EE Explorer*, right-click on the Enterprise Application Project, and select *Add Modules* to add your servlet to this Web application.



Configure the required library references for your Web application:

14. In the *J2EE Explorer*, double-click on the applicaton-j2ee-engine.xml file listed under your Web application.
15. On the *General* tab, add the library references as displayed to the right.



application-j2ee-engine.xml

General

Vendor name: sap.com

Failover: disable

References
- tc/conn/connectorframework
- com.sap.ip.bi.sdk
- bi~mmr~jmi
- bi~mmr~core
- bi~mmr~db
- bi~mmr~cwm_1.0_library

16. Deploy and test your servlet. When you run this servlet, you should retrieve a list of schemas in your system.

4 Appendix: Source Code

Below is source code for example servlet, web.xml, and application-j2ee-engine.xml files which demonstrate this scenario.

4.1 Exercise_4.java servlet

```java
package teched.bi_sdk.exercises;

import java.io.IOException;
import java.io.PrintWriter;
import java.util.List;

import javax.naming.Context;
import javax.naming.InitialContext;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

import org.omg.cwm.analysis.olap.Schema;

import com.sap.ip.bi.sdk.dac.connector.IBIConnection;
import com.sap.ip.bi.sdk.dac.connector.IBIOlap;
import com.sapportals.connector.connection.IConnectionFactory;
import com.sapportals.connector.connection.IConnectionSpec;

public class Exercise_4 extends HttpServlet {
  IConnectionFactory connectionFactory = null;
  IConnectionSpec connectionSpec = null;
  IBIConnection connection = null;

  public void init() throws ServletException {
  }
  public void service(
    HttpServletRequest request,
    HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html");
    PrintWriter out = response.getWriter();
    out.println("<HTML>");
    out.println("<HEAD><TITLE>Sample Servlet</TITLE></HEAD>");
    out.println("<BODY>");
    try {
      Context initctx = new InitialContext();
      // perform JNDI lookup to obtain connection factory
      connectionFactory =
        (IConnectionFactory) initctx.lookup(
          "java:comp/env/" + "SDK_XMLA");

      // get connection using default connection properties
      connection =
        (IBIConnection) connectionFactory.getConnectionEx(null);
      IBIOlap olap = ((IBIConnection) connection).getOlap();

      List schemas = olap.getSchema();
      Schema schema = null;

      for (int i = 0; i < schemas.size(); i++) {
        schema = (Schema) schemas.get(i);
        out.println("schema: " + schema.getName() + "<br>");
      }
    } catch (Exception e) {
      e.printStackTrace(out);
    } finally {
      try {
        connection.close();
      } catch (Exception e) {
        e.printStackTrace(out);
      }
    }
    out.println("</BODY></HTML>");
    out.close();
  }
  public void destroy() {
  }
}
```

4.2 web.xml file

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE web-app PUBLIC "-//Sun Microsystems, Inc.//DTD Web Application
2.3//EN" "http://java.sun.com/dtd/web-app_2_3.dtd">
<web-app>
      <display-name>WEB APP</display-name>
      <description>WEB APP description</description>
      <servlet>
            <servlet-name>Exercise_4</servlet-name>
            <servlet-class>teched.bi_sdk.exercises.Exercise_4</servlet-
class>
      </servlet>
      <resource-ref>
            <res-ref-name>SDK_XMLA</res-ref-name>
            <res-type>javax.resource.cci.ConnectionFactory</res-type>
            <res-auth>Container</res-auth>
      </resource-ref>
</web-app>
```

4.3 application-j2ee-engine.xml file

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE application-j2ee-engine SYSTEM "application-j2ee-engine.dtd">
<application-j2ee-engine>
```

```
  <reference reference-type="weak">
    <reference-target provider-name="sap.com" target-type="library">
        tc/conn/connectorframework
    </reference-target>
  </reference>
  <reference reference-type="weak">
    <reference-target provider-name="sap.com" target-type="library">
        com.sap.ip.bi.sdk
    </reference-target>
  </reference>
  <reference reference-type="weak">
    <reference-target provider-name="sap.com" target-type="library">
        bi~mmr~jmi
    </reference-target>
  </reference>
  <reference reference-type="weak">
    <reference-target provider-name="sap.com" target-type="library">
        bi~mmr~core
    </reference-target>
  </reference>
  <reference reference-type="weak">
    <reference-target provider-name="sap.com" target-type="library">
        bi~mmr~db
    </reference-target>
  </reference>
  <reference reference-type="weak">
    <reference-target provider-name="sap.com" target-type="library">
        bi~mmr~cwm_1.0_library
    </reference-target>
  </reference>
  <provider-name>sap.com</provider-name>
  <fail-over-enable mode="disable"/>
</application-j2ee-engine>
```

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