



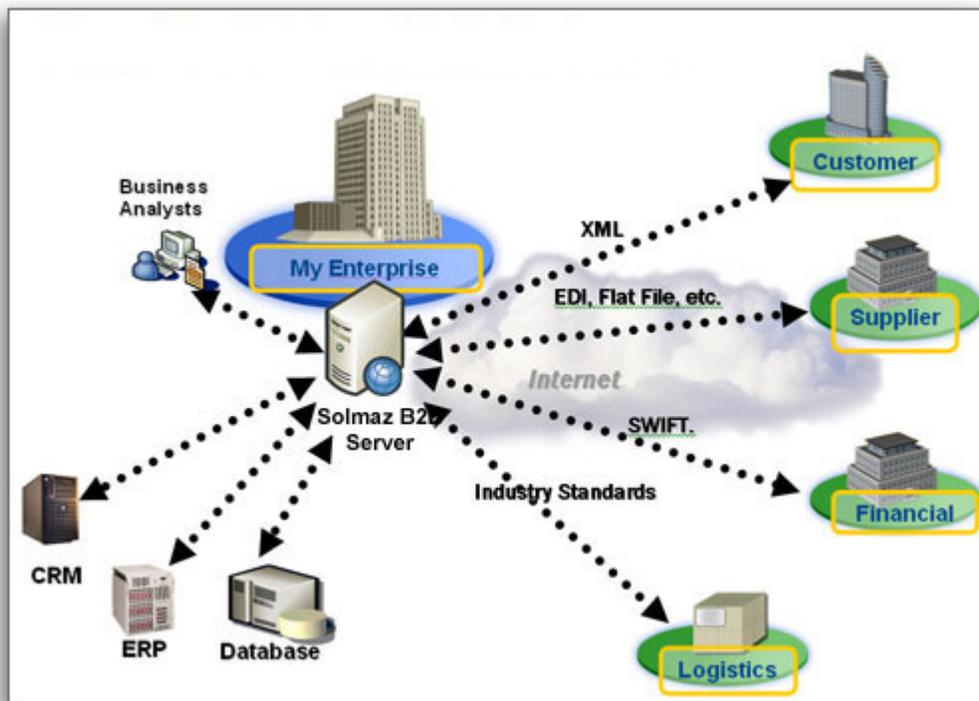
## **“Flash B2B Server System Design”**

<b><i>Project Definition</i></b> _____	<b>4</b>
<b>Common challenges:</b> _____	<b>5</b>
<b>Features &amp; Benefits</b> _____	<b>8</b>
<b><i>Supported File Types and Their Definition</i></b> _____	<b>9</b>
<b>XML</b> _____	<b>9</b>
<b>CSV</b> _____	<b>10</b>
<b>EBXML</b> _____	<b>10</b>
<b>EDIFACT</b> _____	<b>11</b>
<b>ANSI X12</b> _____	<b>11</b>
<b>HL7</b> _____	<b>12</b>
<b>Flat File</b> _____	<b>12</b>
<b>MS - Excel</b> _____	<b>13</b>
<b>XSLT Style Sheet</b> _____	<b>13</b>
<b>LDIF</b> _____	<b>14</b>
<b><i>Supported Protocols</i></b> _____	<b>15</b>
<b>FTP</b> _____	<b>15</b>
<b>SMTP (Mail)</b> _____	<b>15</b>
<b>HTTP (Web)</b> _____	<b>15</b>
<b><i>External Applications and Libraries</i></b> _____	<b>16</b>
<b>Java Programming Language:</b> _____	<b>16</b>
<b>Eclipse</b> _____	<b>16</b>
<b>CVS</b> _____	<b>17</b>
<b>MySQL</b> _____	<b>18</b>
<b>Tomcat HTTP Server</b> _____	<b>18</b>
<b>Xerces XML Parser</b> _____	<b>18</b>
<b>Jakarta Regular Expression Library</b> _____	<b>18</b>
<b>Kunststoff Look &amp; Feel</b> _____	<b>19</b>
<b><i>Packages and Components</i></b> _____	<b>20</b>
<b>Org.flashB2B.TComponent</b> _____	<b>20</b>
<b>Org.flashB2B.base</b> _____	<b>21</b>
<b>Org.flashB2B.chain</b> _____	<b>23</b>
<b>Org.flashB2B.database</b> _____	<b>24</b>
<b>Org.flashB2B.formats</b> _____	<b>25</b>
<b>Org.flashB2B.images</b> _____	<b>26</b>

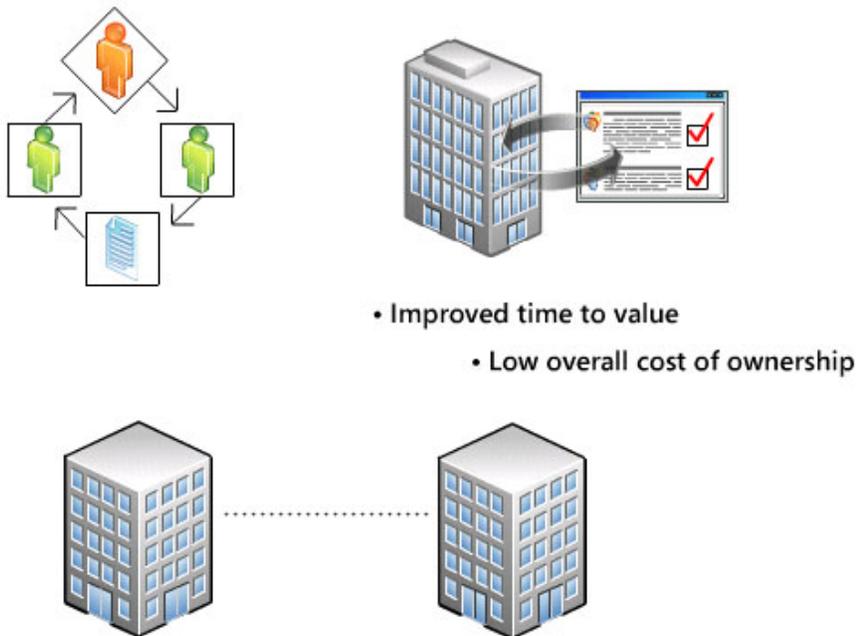
<b>Org.flashB2B.listeners</b>	<b>27</b>
<b>Org.flashB2B.manual</b>	<b>28</b>
<b>Org.flashB2B.mapping</b>	<b>29</b>
<b>Org.flashB2B.protocols</b>	<b>29</b>
<b>Org.flashB2B.users</b>	<b>31</b>
<b><i>References</i></b>	<b>32</b>

## Project Definition

Solmaz B2B Server integrates the flow of documents in electronic platform. There are many standards, protocols and data types in software market. B2B server aims the integration between these systems. Without editing the current platform the applications and companies will communicate. Solmaz B2B Server supports variety of document standards and protocols. With plug-in based system, it is easy to adapt new standards.



Solmaz B2B Server system gives a common infrastructure for business process automation, enterprise application integration and business to business (B2B) exchange. Companies insure improved time to value and low overall cost of ownership. Solmaz B2B is a powerful business management tool that orchestrates the business processes, and seamlessly integrates with different operation systems and document standards to provide business analysis's a flexible environment.



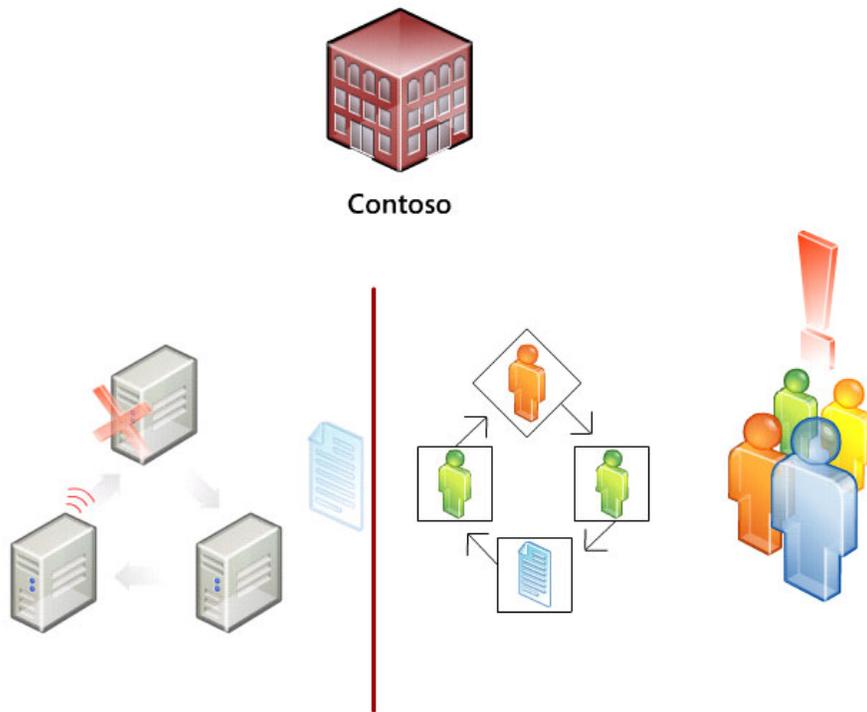
Today connectivity is no longer the end goal of integration, where EAI and B2B are used to be sufficient. Companies now require more business value from their information infrastructure. Specifically integrate and automate the entire business process. Solmaz Server aims efficiently and effectively integrates systems, employees and trading partners.

***Common challenges:***

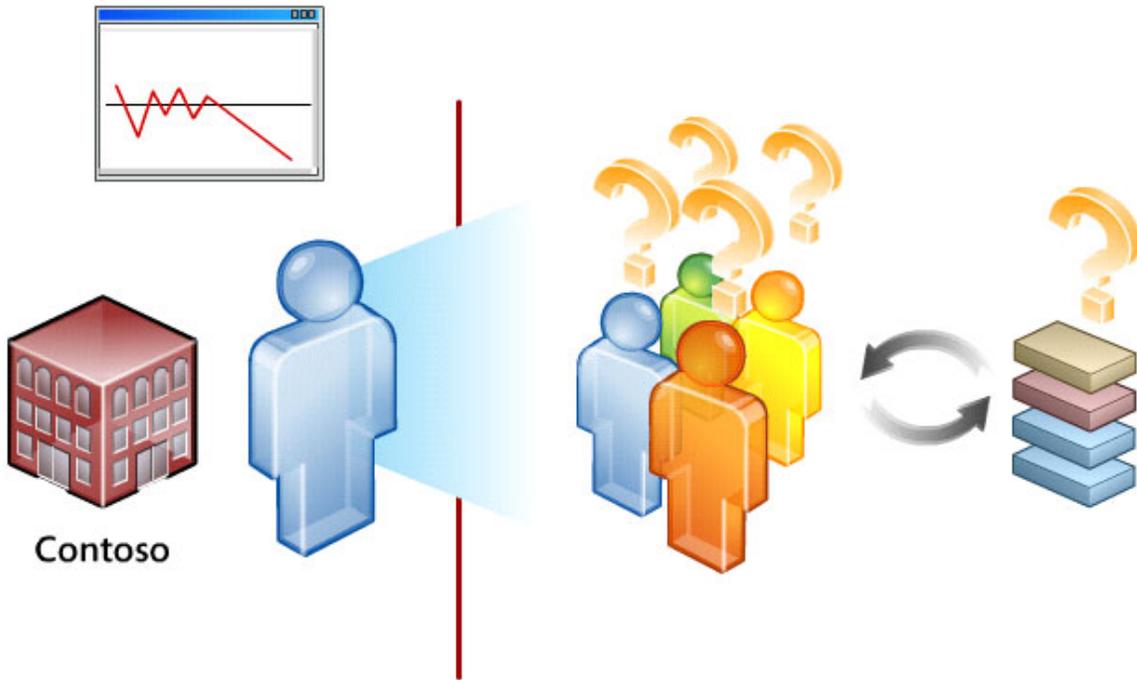
Solmaz B2B Server provides powerful business process management capability. Below is an example, how a company benefits from automating their business processes.

One of the primary issues that organizations face today is an increase in processing delays and limited visibility into global operations. Contoso a global electronic sole seller has grown over the past 30 years to include 20 production subsidiaries, 22 sale subsidiaries, 15 branch offices and two headquarters.

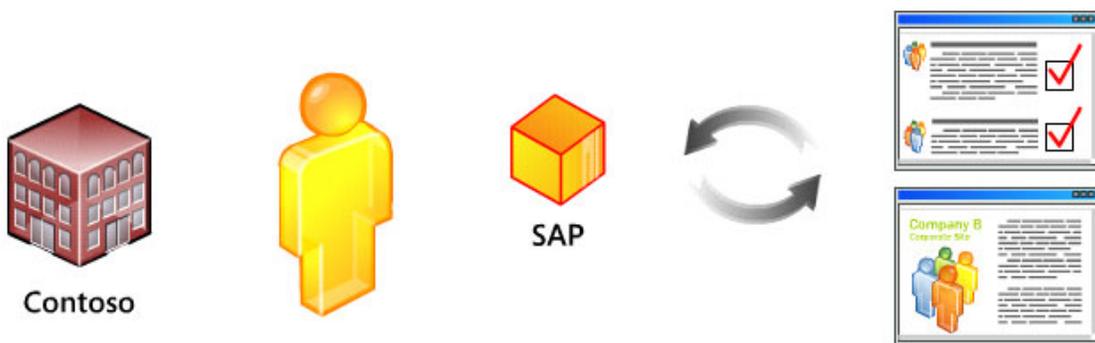
Contoso's infrastructure was built in an evolutionary fashion and therefore it is not integrated. In fact Contoso has two primary systems that do not communicate at all. This desperate structure prevents Contoso from executing business processes including fulfillment of customer orders at the same speed as its competition.



Therefore integrating these systems is crucial. Gaining access to real time data is equally important specifically Contoso is unable to answer customer inquiries regarding order fulfillment because its customer service personnel do not have visibility into the process flow. These issues create significant drop in Contoso's customer service ratings.



Driven by the above challenges, if the company decides to adapt Solmaz B2B Server, first the integration of the desperate system is addressed. The developer builds the orchestration of the system. Contoso relies on SAP on enterprise resource planning. With Solmaz B2B SAP adapter, the developers will integrate SAP with other applications and processes without writing new code.



With using this integration solution Contoso gains real-time visibility into the status of purchase orders, sales, shipping and inventory.

## ***Features & Benefits***

The benefits of the system are

- Highly automated business process management functionality
- Provide Real-Time data delivery between Manufacture and Supplier Chain
- Utilize existing business management systems to electronically transact with Manufactures
- Enhance product reliability and forecasting of product requirements by providing product development information in real time
- Deliver promotional information, training materials and news in real time
- Provide integration into front-office and back-office manufacturing applications from existing business management systems
- Eliminate the need for double entry
- Increase the distributor's customer loyalty by improving the customer experience in sales and services
- Reduce the distributor's operations expenses and increase revenue opportunities by providing near real time delivery of promotional, product, and training information

The features of the Solmaz B2B Server includes

- **Business Activity Monitoring**

- Powerful for information workers to monitor transactions and processes in real time
- **Document Transport and Routing Services**
  - Services that support evaluating where documents should be routed, and the underlying transport services to perform document delivery
- **Internal Application Integration Services**
  - Services that support the integration of off-the-shelf and custom applications into business processes
- **Data Transformation Services**
  - Services that enable data to be transformed between the dramatically varying formats used by different business applications and trading communities, such as XML, EDI and many others
- **Process Automation and Management Services**
  - Services that support the integration of applications and data sources into streamlined business processes within and between organizations

## **Supported File Types and Their Definition**

### ***XML***

XML was designed to describe structured data. It's a markup language similar to Hypertext Markup Language (HTML). Unlike HTML, XML tags are not predefined. Since you make up your own tags, XML uses a Document Type Definition (DTD) to describe its data to applications that use it.

XML was designed to describe data and focus on what the data is. XML data can be viewed in a browser or it can be passed to other applications for processing and viewing.

Here is an example of an XML document:

```
<?xml version="1.0"?>
<message>
  <to>Dave</to>
  <from>Susan</from>
  <subject>Reminder</subject>
  <text>Don't forget to buy milk on the way home.</text>
</message>
```

## **CSV**

CSV is a file format used as a portable representation of a database. Each line is one entry or record and the fields in a record are separated by commas. Commas may be followed by arbitrary space and/or tab characters which are ignored. If field includes a comma, the whole field must be surrounded with double quotes.

```
Doe,John,944-7077
Johnson,Mary,370-3920
Smith,Abigail,299-3958
(etc.)
```

## ***EBXML***

EbXML (Electronic Business using eXtensible Markup Language), is a modular suite of specifications that enables enterprises of any size and in any geographical location to conduct business over the Internet. Using ebXML, companies have a standard method to

exchange business messages, conduct trading relationships, communicate data in common terms and define and register business processes.

### **EDIFACT**

EDIFACT is the standard ensuring that many business operations between companies, sectors and countries, and particularly the routine transactions undertaken thousands of times every day, can be handled electronically regardless of the hardware and software used by either side. The word stands for Electronic Data Interchange for Administration, Commerce and Transport.

```
UNB+UNOA:2+TVCBBKTW00125:TP+TVCBBNTW00005:TPTV+950101:1530+INVOIC-
1++++1
UNH+ME000001+INVOIC:2:901:UN:EAN005
BGM+380+IN112233+950101:1000
RFF+PO+PO112233+941225
RFF+PL+PL123+941201
```

### **ANSI X12**

Standards defining the structure, format, and content of business transactions conducted through Electronic Data Interchange (EDI). ANSI X12 is produced by the committee ASC X12, supported by the Data Interchange Standards Association, Inc. (DISA).

```
ISA*00*      *00*      *27*00883      *ZZ*I08587
*020802*0046*U*00401*000000002*0*T*:~
GS*HP*00883*I08587*20020802*004653*13*X*004010X091~
ST*835*000000001~
BPR*H*0*C*NON*****20020731~
TRN*1*507370267*1571062326~
REF*EV*I08587~
DTM*405*20020731~
N1*PR*PALMETTO GBA~
N3*PO BOX 182957~
```

## **HL7**

Health Level Seven is one of several American National Standards Institute (ANSI) - accredited Standards Developing Organizations (SDOs) operating in the healthcare arena. Most SDOs produce standards (sometimes called specifications or protocols) for a particular healthcare domain such as pharmacy, medical devices, imaging or insurance (claims processing) transactions. Health Level Seven's domain is clinical and administrative data.

"Level seven" refers to the highest level of the International Standards Organization's (ISO) communications model for Open Systems Interconnection (OSI) - the application level. The application level addresses definition of the data to be exchanged, the timing of the interchange, and the communication of certain errors to the application. The seventh level supports such functions as security checks, participant identification, availability checks, exchange mechanism negotiations and, most importantly, data exchange structuring.

<u>WRP</u>	<u>Widget Report</u>	<u>Chapter</u>
MSH	Message Header	2
MSA	Message acknowledgment	2
{ WDN	Widget Description	XX
WPN	Widget Portion	XX
{ [WPD] }	Widget Portion Detail	XX

## **Flat File**

A database that contains a single table and can be easily represented using plain text. This type of database contrasts with a relational database, which can contain any number of tables that are linked together. Often, to keep things simple when transferring data

between organizations, people will request a flat file. Common flat file text formats include tab-delimited and CSV.

```
123456789,"Carr, Lisa",100000.00  
444556666,"Barr, Clark",87000.00  
777227878,"Rabbitt, Jack",123000.00
```

### ***MS - Excel***

**Microsoft Excel** is a spreadsheet program written and distributed by Microsoft for computers using the Microsoft Windows operating system and Apple Macintosh computers. It is overwhelmingly the dominant spreadsheet application available for these platforms and has been so since version 5 (1993) and its bundling as part of Microsoft Office.

### ***XSLT Style Sheet***

The XSLT language was defined by the World Wide Web Consortium (W3C), and version 1.0 of the language was published as a Recommendation on November 16, 1999. XSLT has its origins in the aspiration to separate information content from presentation on the Web. HTML, as originally defined, achieved a degree of device independence by defining presentation in terms of abstractions such as paragraphs, emphasis, and numbered lists. As the Web became more commercial, publishers wanted the same control over quality of output that they had with the printed medium. This gradually led to an increasing use of concrete presentation controls such as explicit fonts and absolute positioning of material on the page. The unfortunate but entirely predictable side effect was that it became increasingly difficult to deliver the same content to alternative devices

such as digital TV sets and WAP phones (*repurposing* in the jargon of the publishing trade).

```
<results group="A">
<match>
  <date>10-Jun-1998</date>
  <team score="2">Brazil</team>
  <team score="1">Scotland</team>
</match>
<match>
  <date>23-Jun-1998</date>
  <team score="0">Scotland</team>
  <team score="3">Morocco</team>
</match>
</results>
```

## **LDIF**

LDIF is short for *LDAP Data Interchange Format*. This is the data type that describes the directory and directory entries in a text format. It is used to populate the directory and to automate addition of large amounts of entries all at once. The LDIF format is also used to modify existing directory entries.

Values for attributes may be UTF-8 or base 64 encoded data, or an URL (Universal Resource Locator) may be provided to locate the actual value for an attribute. Lines beginning with a hash mark (#) are ignored; lines beginning with a single space are interpreted as the continuation of the previous line. Multiple values for the same attribute are specified on separate lines.

```
# entry-id: 34
dn: cn=stella,ou=hosts,dc=example,dc=com
cn: stella
ipHostNumber: 192.168.13.103
objectClass: top
objectClass: iphost
creatorsName: uid=admin,ou=administrators,ou=topologymanagement,o=netscaperoot
```

```
modifiersName:  
uid=admin,ou=administrators,ou=topologymanagement,o=netscaperoot  
createTimestamp: 20031127062446Z  
modifyTimestamp: 20031127062446Z  
nsUniqueId: 490fe981-1dd211b2-80bdd1dd-c2b06d66
```

## Supported Protocols

Solmaz B2B Server supports several platforms to exchange data. Below are the currently supported protocols.

### ***FTP***

FTP is short for File Transfer Protocol, and that's just what FTP is: the file transfer protocol in the Internet's TCP/IP protocol suite. You use FTP to copy (not really transfer) files from one computer to another. Both computers have to be connected to the Internet or another computer network using the Internet's TCP/IP communications protocols (like the ADN-ii), and your local computer and the remote computer that you're exchanging files with must "talk" FTP.

### ***SMTP (Mail)***

Short for *Simple Mail Transfer Protocol*, a protocol for sending e-mail messages between servers. Most e-mail systems that send mail over the Internet use SMTP to send messages from one server to another; the messages can then be retrieved with an e-mail client using either POP or IMAP. In addition, SMTP is generally used to send messages from a mail client to a mail server.

### ***HTTP (Web)***

Short for *Hypertext Transfer Protocol*, the underlying protocol used by the World Wide Web. HTTP defines how messages are formatted and transmitted, and what actions Web

servers and browsers should take in response to various commands. For example, when you enter a URL in your browser, this actually sends an HTTP command to the Web server directing it to fetch and transmit the requested Web page.

## **External Applications and Libraries**

The project used several applications, libraries and languages. The detailed list and their definition are given below.

### ***Java Programming Language:***

Solmaz B2B is written in Java programming language. Java is a language developed by Sun Microsystems which allows World Wide Web pages to contain code that is executed on the browser. Because Java is based on a single "virtual machine" that all implementations of java emulate, it is possible for Java programs to run on any system which has a version of Java. It is also possible for the "virtual machine" emulator to make sure that Java programs downloaded through the web do not attempt to do unauthorized things.

The developers were familiar with this language and developed several projects.

### ***Eclipse***

The Eclipse Platform (or simply "the Platform" when there is no risk of confusion) is designed and built to meet the following requirements:

- Support the construction of a variety of tools for application development.
- Support an unrestricted set of tool providers, including independent software vendors (ISVs).

- Support tools to manipulate arbitrary content types (e.g., HTML, Java, C, JSP, EJB, XML, and GIF).
- Facilitate seamless integration of tools within and across different content types and tool providers.
- Support both GUI and non-GUI-based application development environments.
- Run on a wide range of operating systems, including Windows<sup>®</sup> and Linux<sup>™</sup>.
- Capitalize on the popularity of the Java programming language for writing tools.

The Eclipse Platform's principal role is to provide tool providers with mechanisms to use, and rules to follow, that lead to seamlessly-integrated tools. These mechanisms are exposed via well-defined API interfaces, classes, and methods. The Platform also provides useful building blocks and frameworks that facilitate developing new tools.

The members of the development group were familiar with this environment and no time spent on education.

## **CVS**

CVS is the Concurrent Versions System, the dominant open-source network-transparent version control system. CVS is useful for everyone from individual developers to large, distributed teams:

- Its client-server access method lets developers access the latest code from anywhere there's an Internet connection.
- Its unreserved check-out model to version control avoids artificial conflicts common with the exclusive check-out model.
- Its client tools are available on most platforms.

The CVS server was installed to one of the Computer Club servers and a module was created. It was able for the developers to work at the same time and report the changes.

### ***MySQL***

MySQL is a very fast, multi-threaded, multi-user, and robust Structured Query Language database server. It is a relational database management system which stores data in separate tables rather than putting all the data in one big storeroom which adds speed and flexibility. The tables are linked by defined relations making it possible to combine data from several tables on request.

### ***Tomcat HTTP Server***

Tomcat is the servlet container that is used in the official Reference Implementation for the Java Servlet and Java Server Pages technologies. The Java Servlet and Java Server Pages specifications are developed by Sun under the Java Community Process.

This project was used as an http server for Java servlets.

### ***Xerces XML Parser***

Xerces (named after the Xerces Blue butterfly) provides world-class XML parsing and generation. Fully-validating parsers are available for both Java and C++, implementing the W3C XML and DOM (Level 1 and 2) standards, as well as the de facto SAX (version 2) standard. The parsers are highly modular and configurable. Initial support for XML Schema (draft W3C standard) is also provided.

Xerces was used to parse the XML documents inside the project.

### ***Jakarta Regular Expression Library***

Regexp is a 100% Pure Java Regular Expression package that was graciously donated to the Apache Software Foundation by Jonathan Locke.

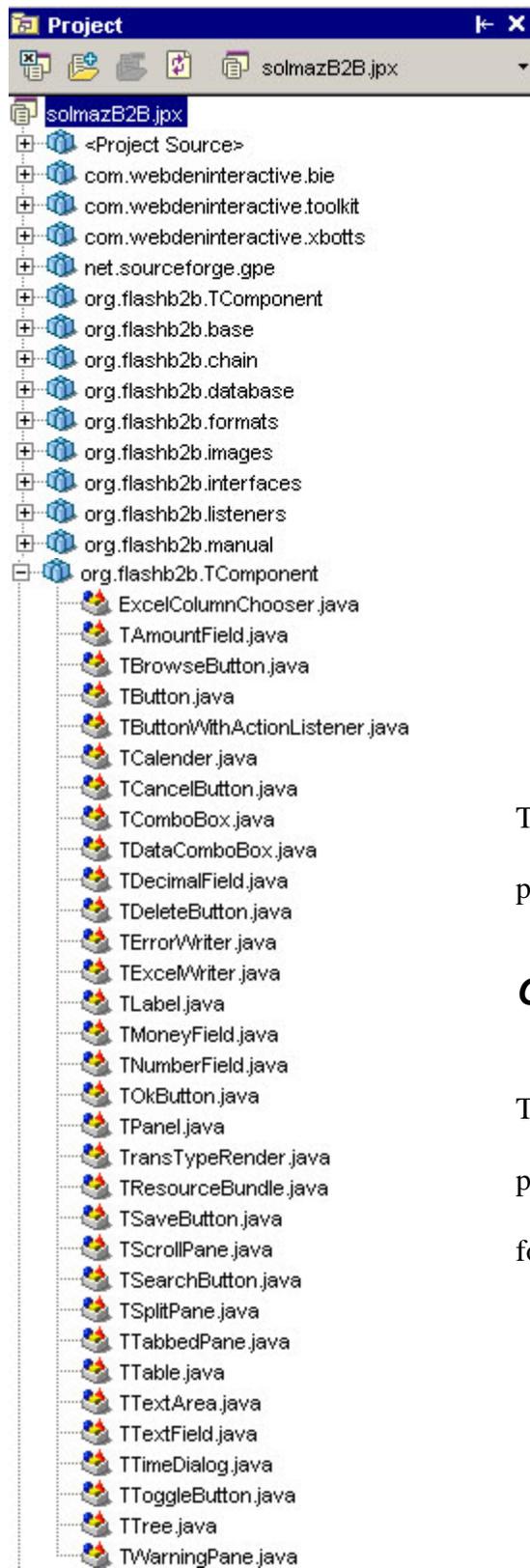
This library was used for regular expression support inside the project.

### ***Kunststoff Look & Feel***

The *Kunststoff Look Feel* is an extension to the Java™ Metal Look Feel. This makes it very compact in size (approx. 43 Kbytes) and ensures that all the great features provided by the Metal Look Feel do not get lost.

## Packages and Components

Solmaz B2B Server has a layered structure. It has Business and Data access layer. The



program and its components are in Business layer. Database functions, queries and JDBC are at database layer. The package list is below.

First three packages, com.webdeninteractive.bie, com.webdeninteractive.toolkit and com.webdeninteractive.xbotts are imported for XML mapping features. The net.sourceforge.gpe is imported for plug-in engine.

The developers of the project implemented the packages starting with org.

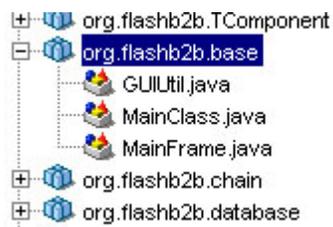
### ***Org.flashB2B.TComponent***

This package has the components used in the program. All swing components are extended for future implementation. The list is on left. A

simple class file without extension is given below. Only picture is inserted inside the button.

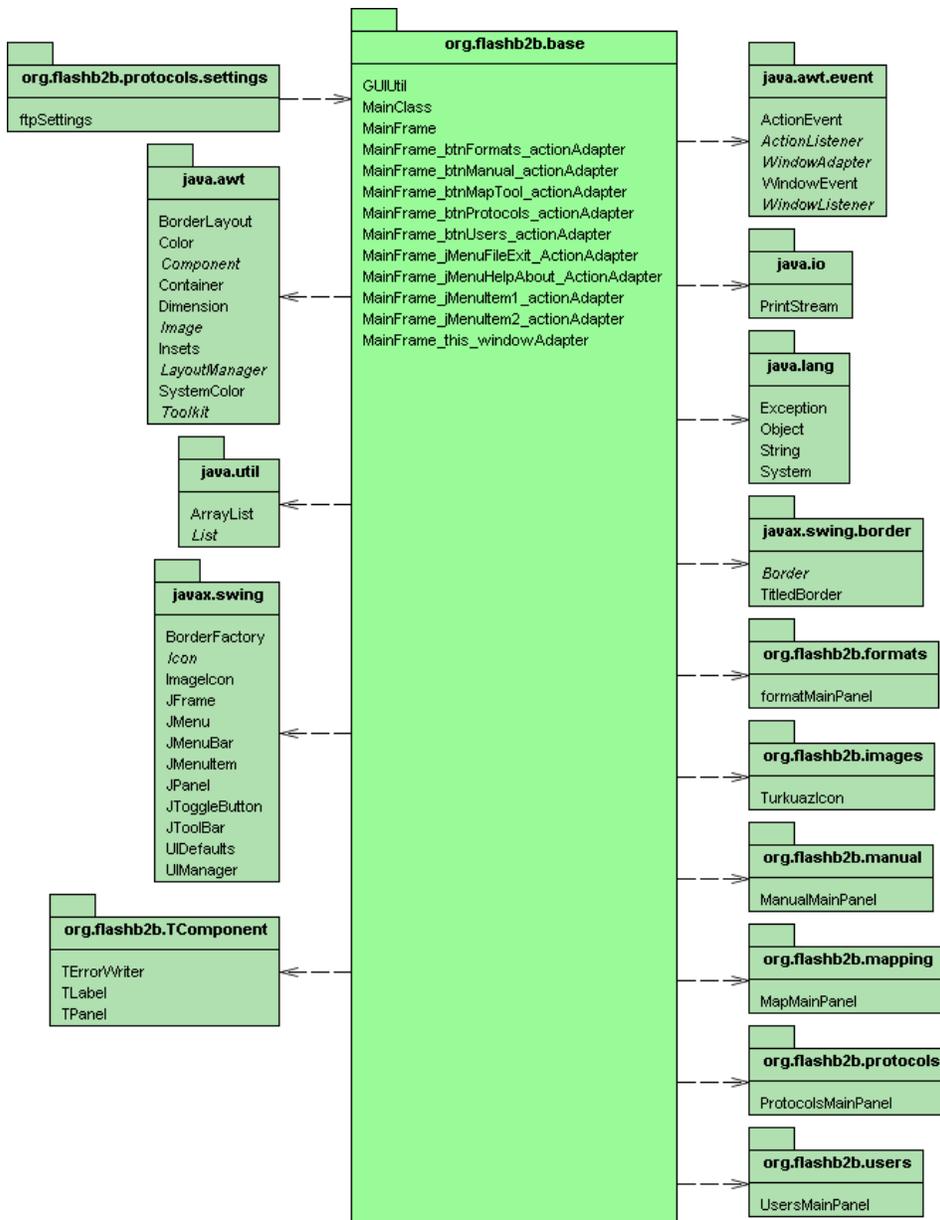
```
1 package org.flashb2b.TComponent;
2
3 import javax.swing.JButton;
4 import org.flashb2b.images.TurkuazIcon;
5 import javax.swing.SwingConstants;
6
7
8
9 public class TCancelButton
10     extends JButton {
11     private TurkuazIcon ti = new TurkuazIcon();
12     public TCancelButton() {
13         super();
14         try {
15
16             jbInit();
17         }
18         catch (Exception ex) {
19             ex.printStackTrace();
20         }
21     }
22
23     private void jbInit() throws Exception {
24         this.setHorizontalAlignment(SwingConstants.LEFT);
25         this.setIcon(ti.getIcon("Cancel24.gif"));
26     }
27
28 }
29
```

## Org.flashB2B.base



This package has the main frame and the user interface. It calls other packages to form the content of the frame. The list of the classes is given on left pane.

Below is the UML Diagram of org.flashB2B.base

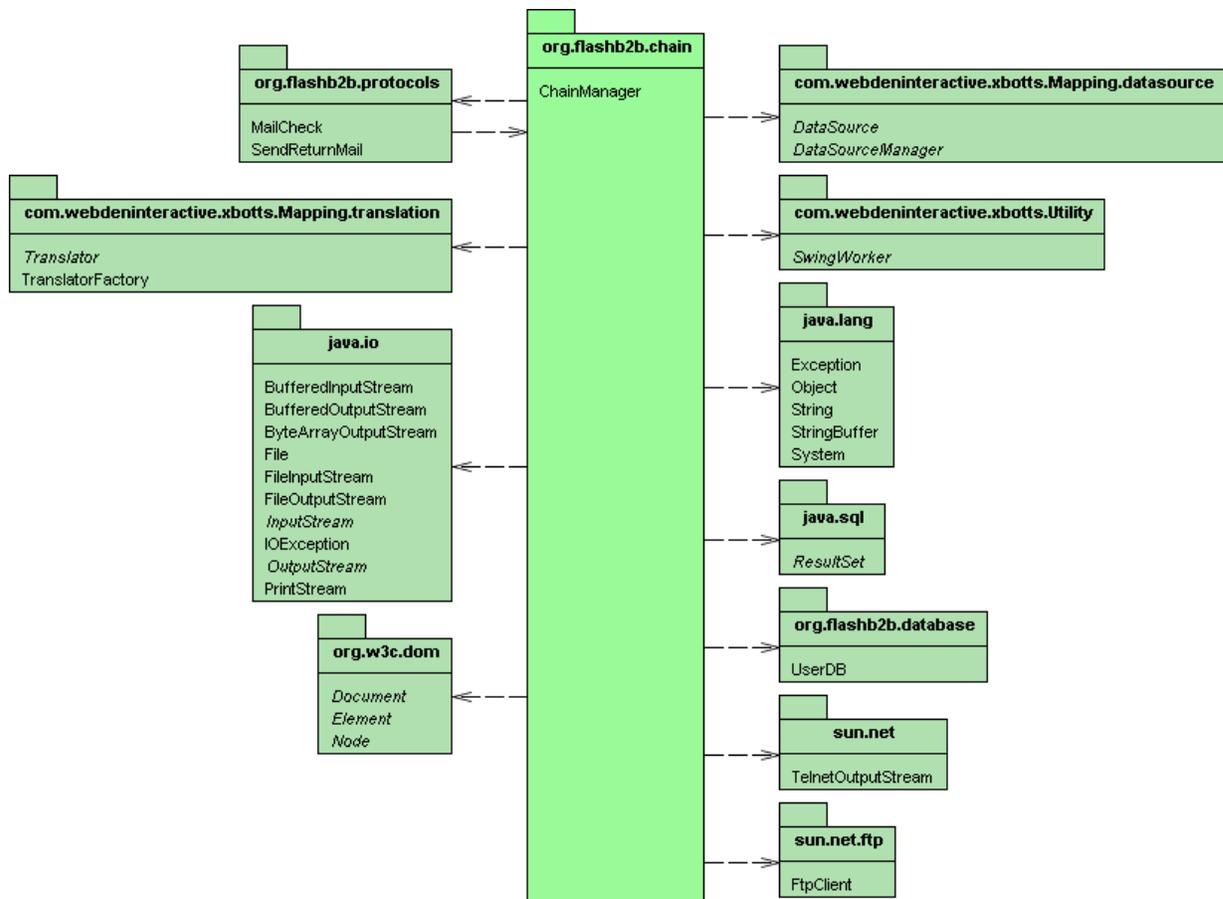


## Org.flashB2B.chain



This package contains the chain manager class which is the most important class in the project. When a protocol receives a file, it calls ChainManager class for processing the route defined for the file.

Below is the UML Diagram of this package.

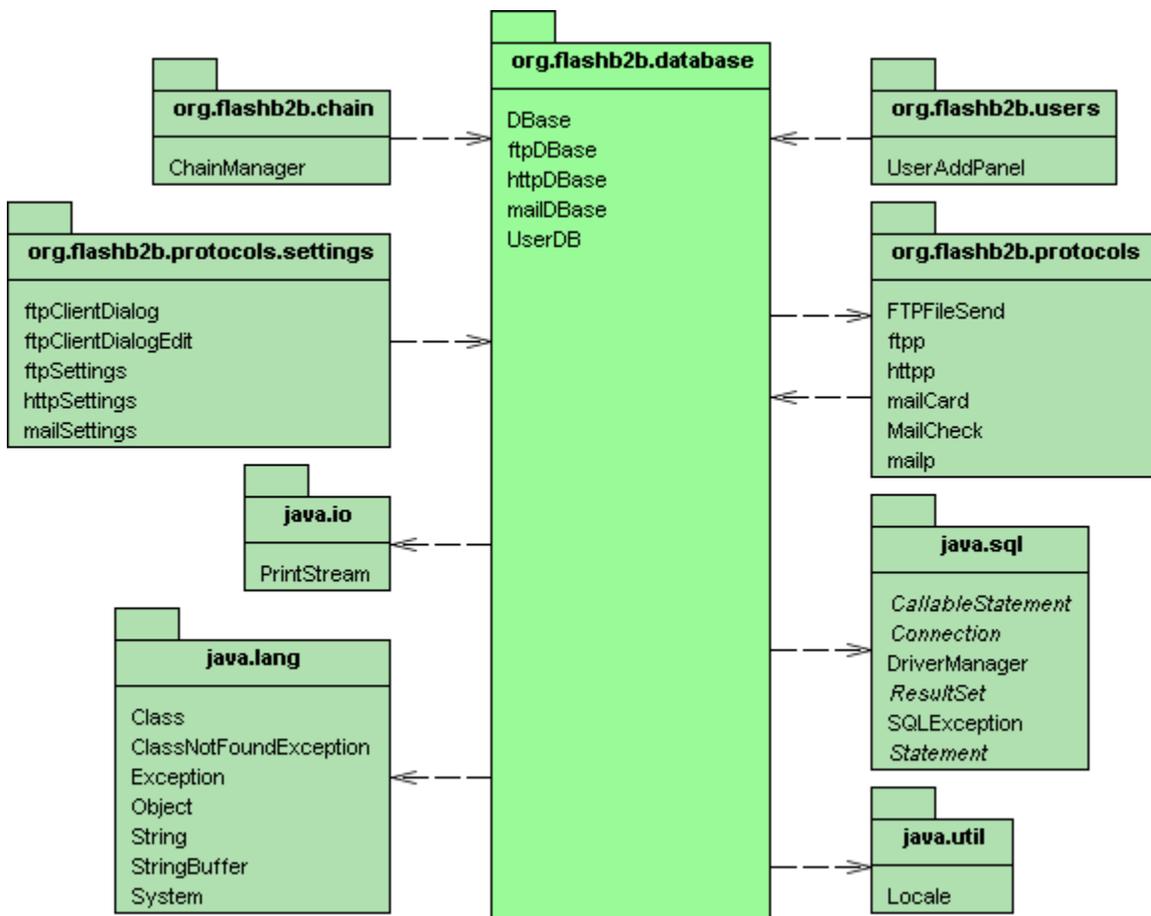


## Org.flashB2B.database

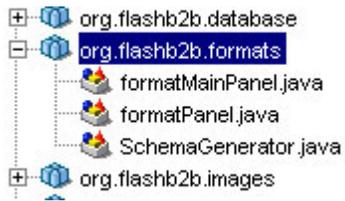


This package contains the classes for reaching database and selecting information from database. All SQL queries appear in these classes.

Below is the UML of this package

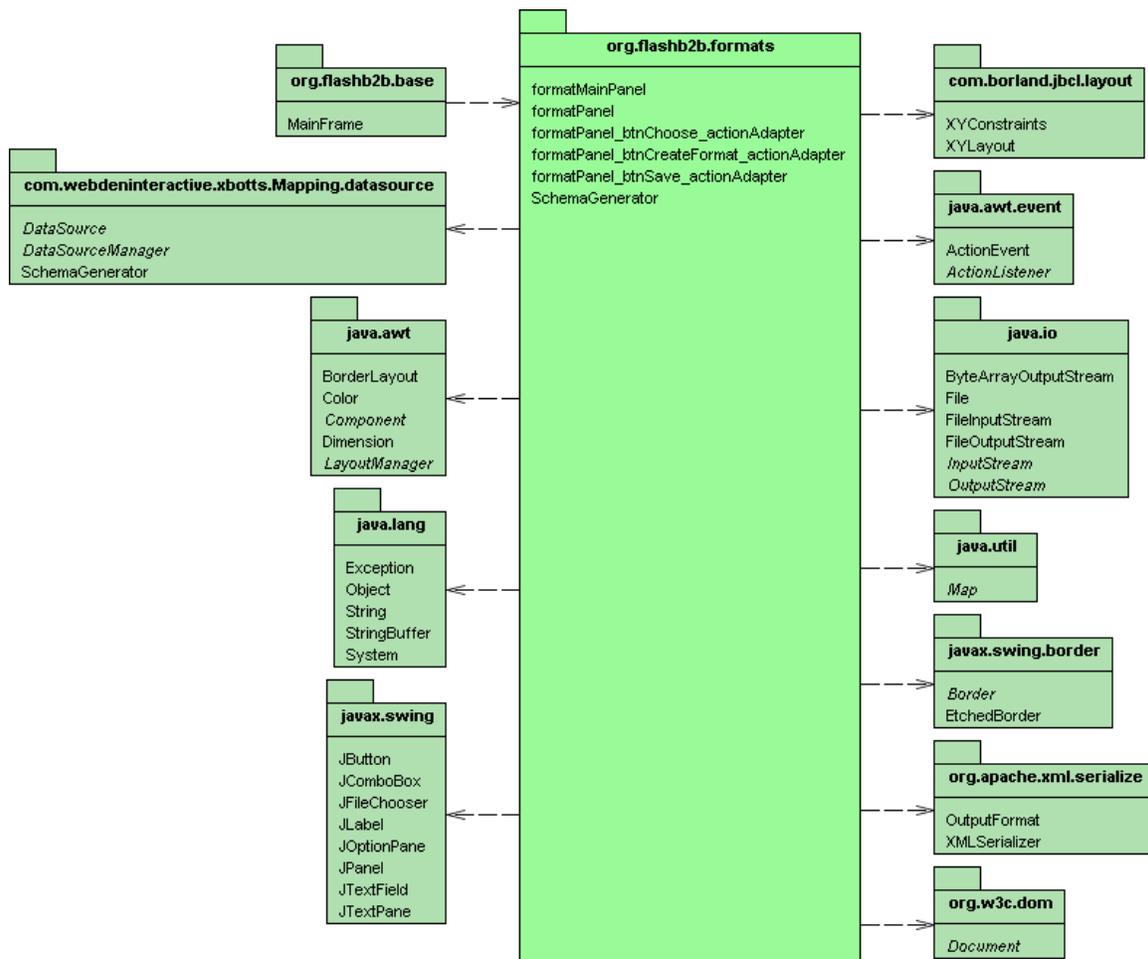


## Org.flashB2B.formats



This package contains the user interface for creating the file format description (XML schema). This file format then will be used in mapping tool.

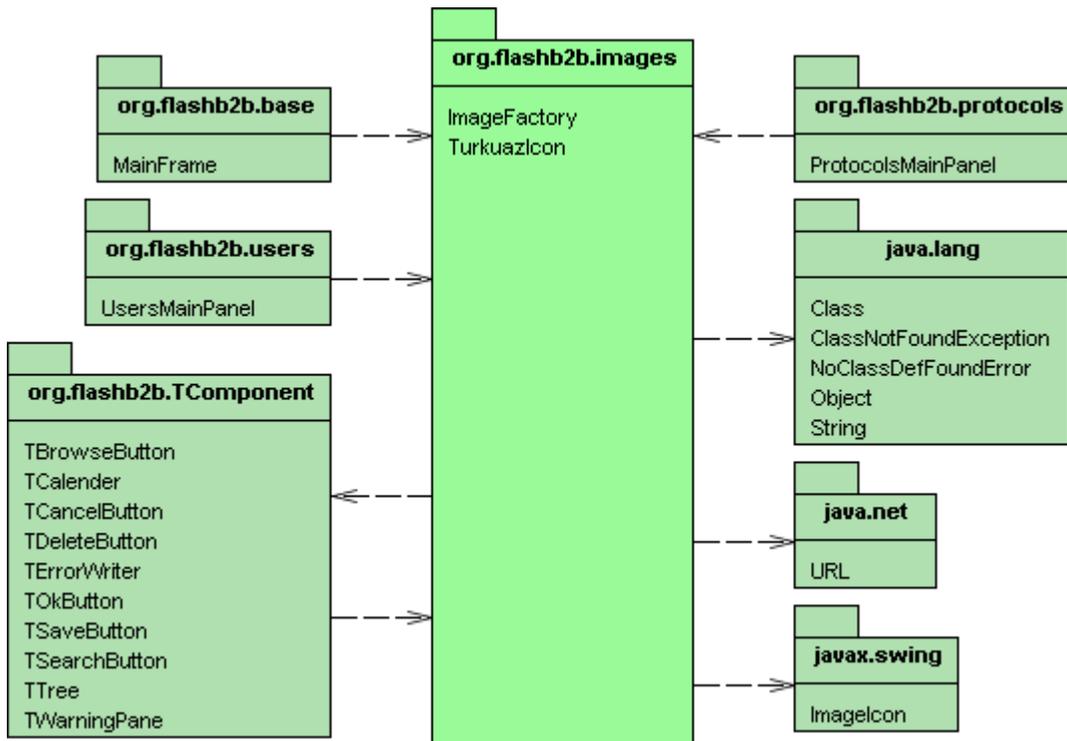
Below is the UML of this package



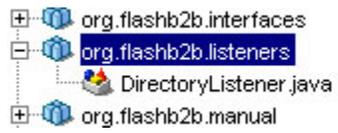
## Org.flashB2B.images

This package contains the necessary image files and classes to reach these images from other user interface classes.

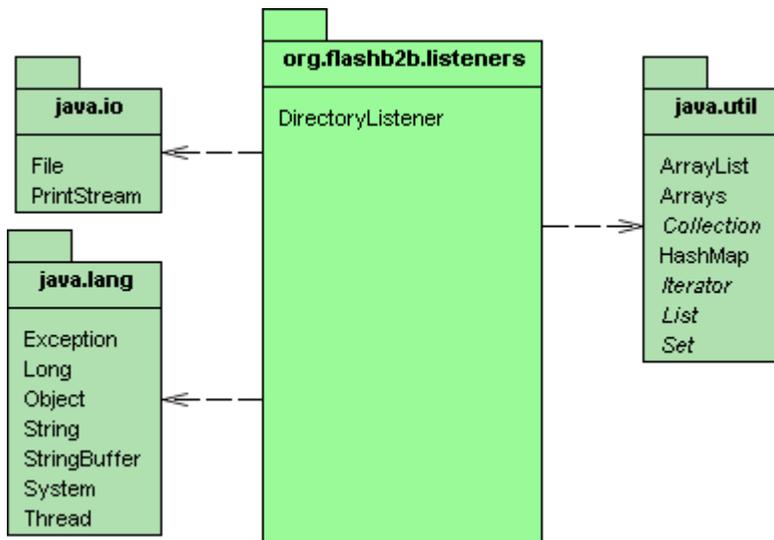
Below is the UML of this package.



## Org.flashB2B.listeners



This package contains the class for listening changes in a directory. Directory listener is used in Ftp protocol.

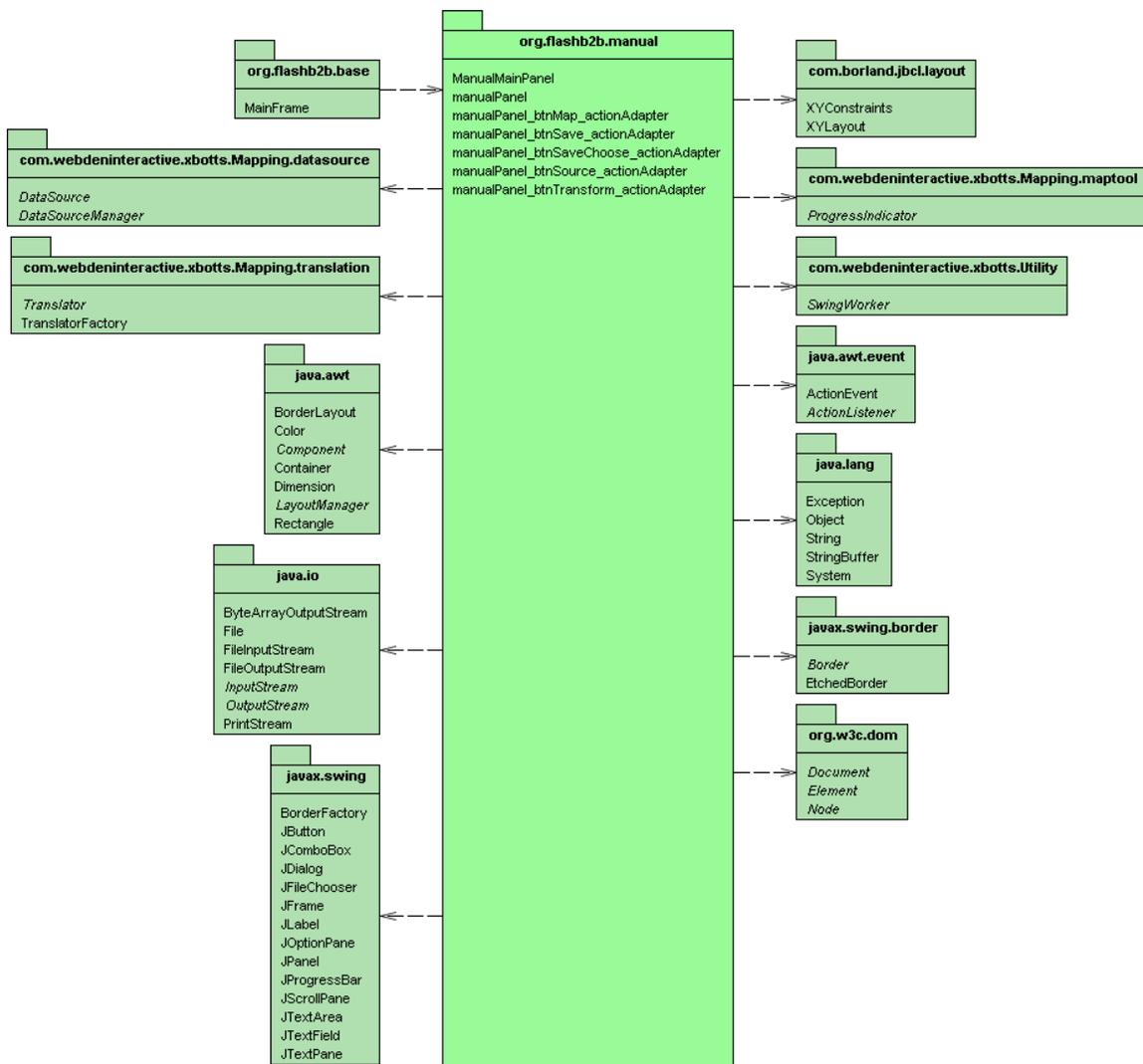


## Org.flashB2B.manual



This package contains the classes for manually transforming from a file format to another one. It is useful for debugging map files before using map files in route definitions.

Below is the UML of this package.

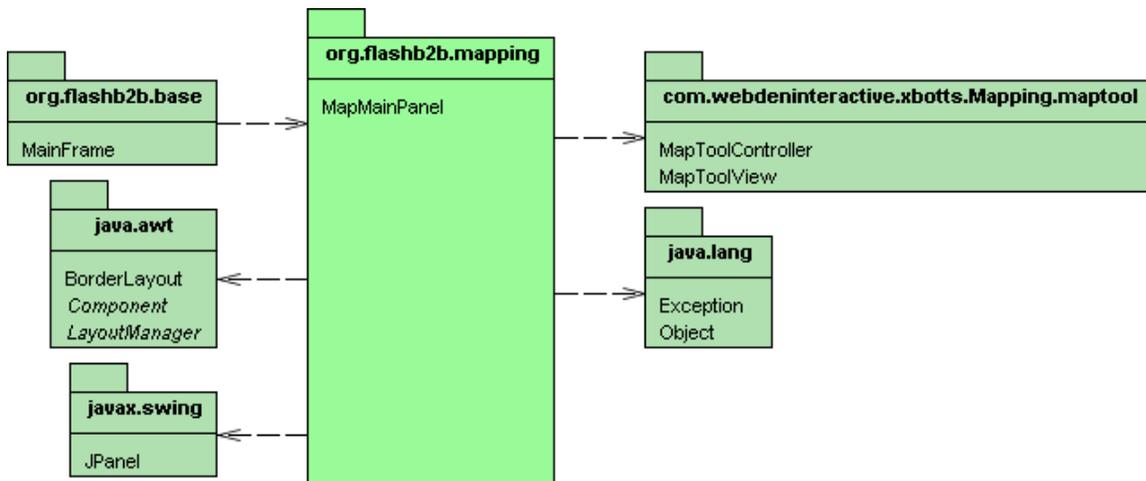


## Org.flashB2B.mapping

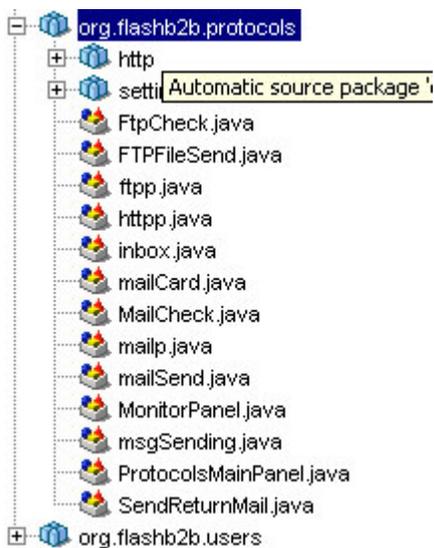


This package contains the user interface class for defining and constructing a transformation map.

Below is the UML diagram of this package

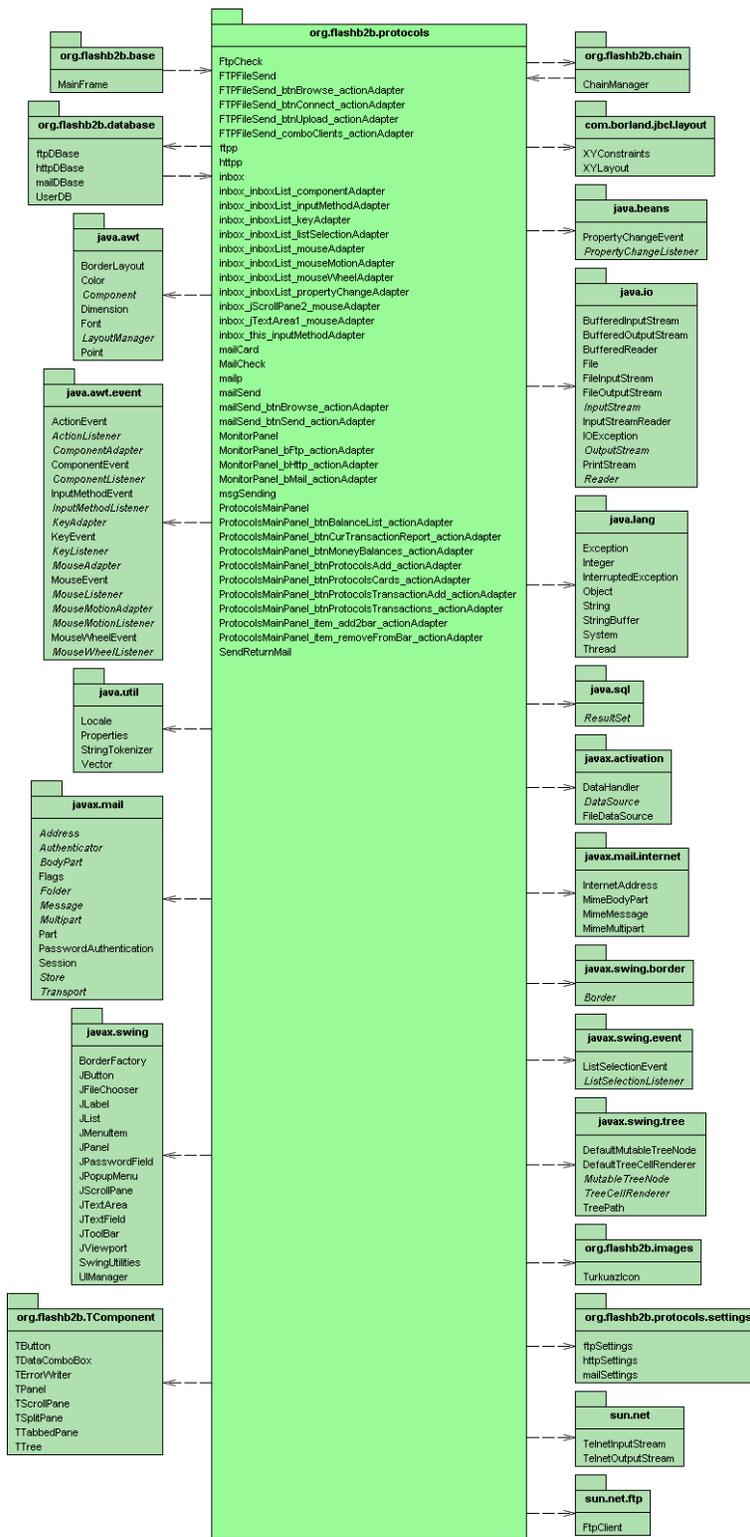


## Org.flashB2B.protocols

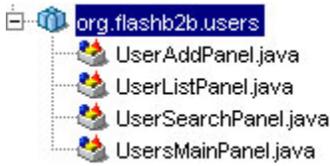


Another crucial part of the project is the protocol package. This package contains classes for listening SMTP, ftp, http protocols. When a file is received, it is forwarded to the Chain Manager.

The UML Diagram of this package is below.



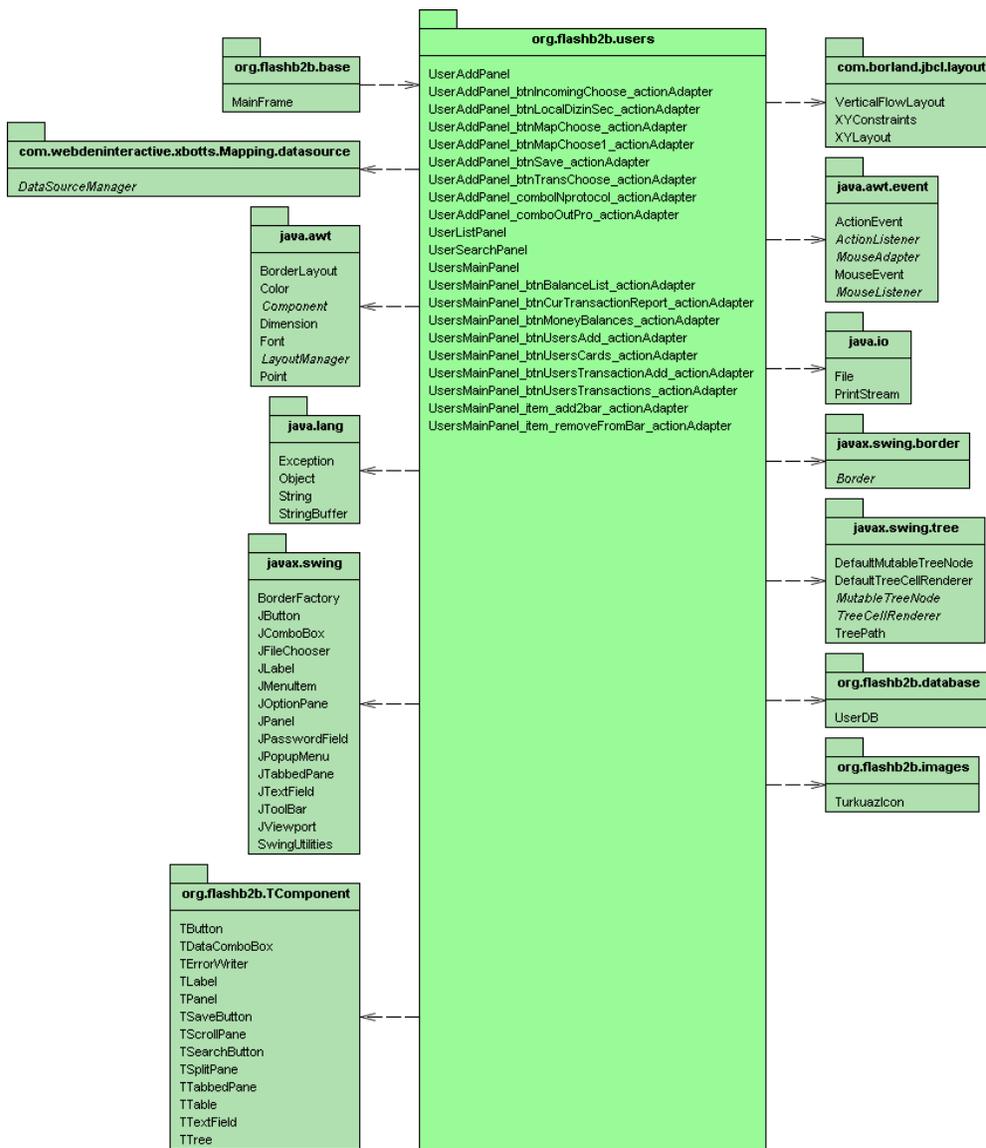
## Org.flashB2B.users

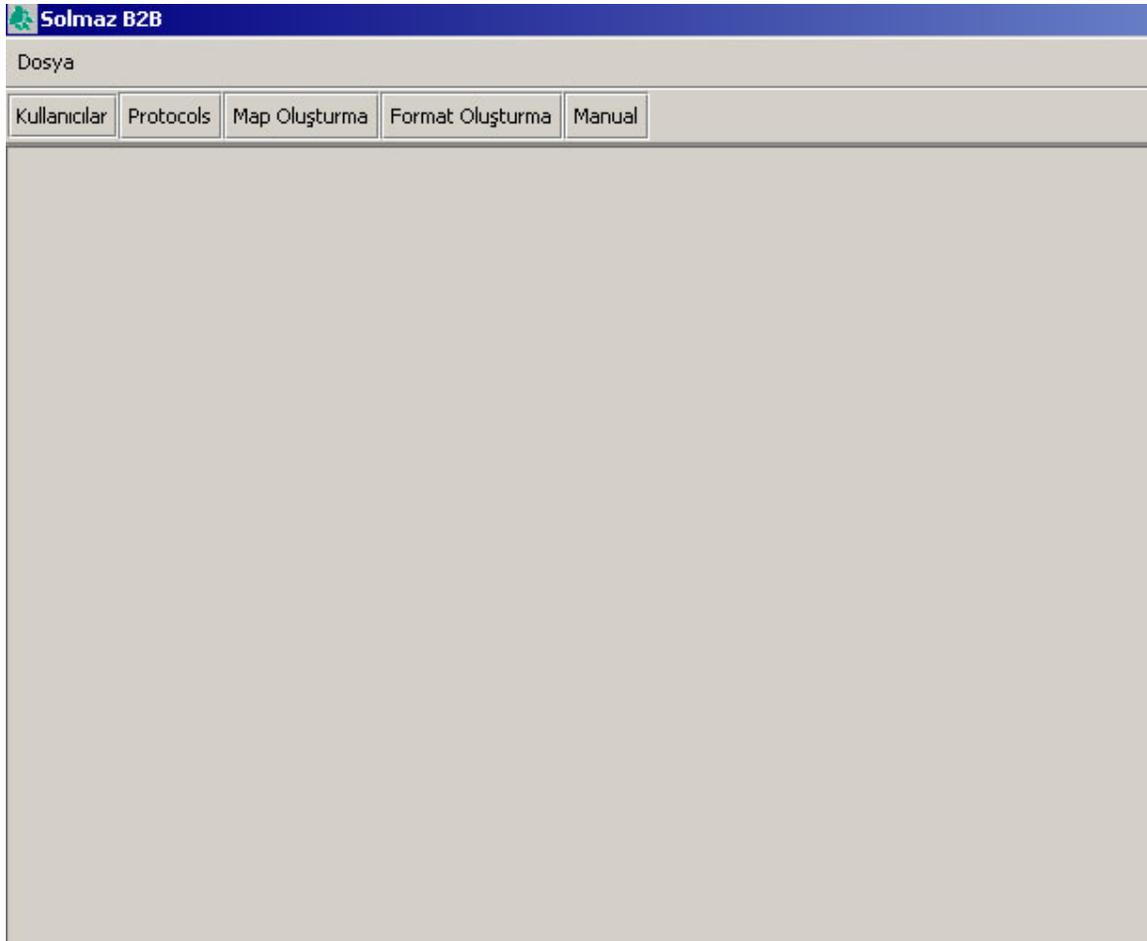


This package contains the classes for creating new users, editing existing users, defining new route for the users' files or editing existing previously defined routes. Also, the

classes that can generate activity reports for the users are contained in this package

Below is the UML Diagram of this package:





## References

Java Language and JRE <http://java.sun.com>

Microsoft BizTalk <http://www.microsoft.com/biztalk/>

Eclipse <http://www.eclipse.org>

CVS <http://www.cvshome.org>

MySQL Database Server <http://www.mysql.com>

Tomcat http Server <http://jakarta.apache.org/tomcat/>

Jakarta Regular Expression Library <http://jakarta.apache.org/regexp/>