ObjectBridge Java Edition

ObjectBridge Java Edition, as a part of SCORE/Integration Suite, is the connective element between an object oriented Java Client and almost any kind of server components. ObjectBridge Java Edition generates Java classes (proxies) by that a client application, developed in Java, can call either an object oriented server like Java or C++, or a not object oriented one like a Cobol program.

ObjectBridge Java Edition

As an additional component to SCORE/Integration Suite, ObjectBridge Java Edition supports an object-based access on all components, integrated with SCORE/Integration Suite. It is irrespective whether the component itself has been developed by the use of object-oriented tools, resp. programming languages or not.

Proxy Generation

On client side, a Java application program, developed by ObjectBridge Java Edition generated Java classes, is able to access on any server component, created with SCORE/Integration Suite. The Java programmer is no longer aware how this component was implemented, since the calls of servers occur by generated Java classes (proxies). The developer only uses the outer component interfaces.

The proxies convert their method calls into respective server requests. A Java programmer can call the server component as if it was a Java written class with corresponding methods.

Conversion of the Java data types into server side data types and vice versa is performed automatically within the generated classes.

Middleware Independent

It is irrespective to the application program, whether a server is processed on the same computer or running on a remote system and being called by a middleware. That means, at first, the client application can be developed locally. Afterwards, the transparent SCORE/Middleware Target can call the respective server component without modifying the Java client.

From technical side, the generated Java proxies communicate to the particular middleware through the Client Middleware Frame (CMF). The middleware itself is the connective element for further communication between Server Middleware Frame (SMF) and Server Component Frame (SCF) to the actual server module. CMF, SMF and SCF are provided or generated by SCORE/Integration Suite (see illustration on the right side).

| Java Application |
| Java Proxy |
| Client Middleware Frame |

| Middleware |

| Server Middleware Frame |
| SCF |
| Server |
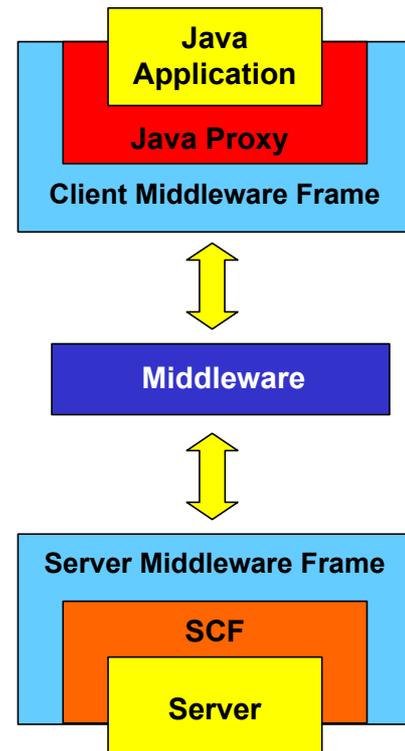
A Client/Server application structure with Java proxies.

ObjectBridge Java Edition

As an additional component to SCORE/Integration Suite, ObjectBridge Java Edition supports an object-based access on all components, integrated with SCORE/Integration Suite. It is irrespective whether the component itself has been developed by the use of object-oriented tools, resp. programming languages or not.

Proxy Generation

On client side, a Java application program, developed by ObjectBridge Java Edition generated Java classes, is able to access on any server component, created with SCORE/Integration Suite. The Java programmer is no longer aware how this component was implemented, since the calls of servers occur by generated Java classes (proxies). The developer only uses the outer component interfaces.

The proxies convert their method calls into respective server requests. A Java programmer can call the server component as if it was a Java written class with corresponding methods.

Conversion of the Java data types into server side data types and vice versa is performed automatically within the generated classes.

ObjectBridge Components

ObjectBridge Java Edition consists of the following components:

- ✓   A generator for creating Java classes
- ✓   The Java basic classes archive
- ✓   A middleware interface for local server calls

The ObjectBridge Generator

The component repository is the originator for the ObjectBridge generator that contains the server component definitions (like interface descriptions, objects, methods, signatures and so on).

The ObjectBridge generator interprets this information and creates the respective Java classes (proxies).

Component
Repository

ObjectBridge
Generator
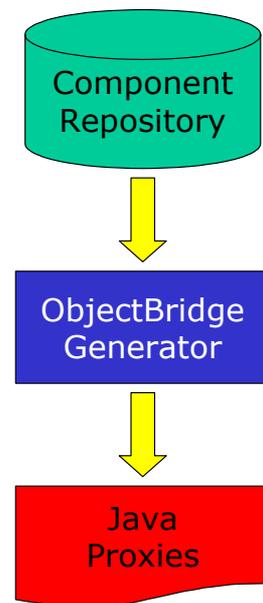
Java
Proxies

Execution of a generation with ObjectBridge Java Edition.
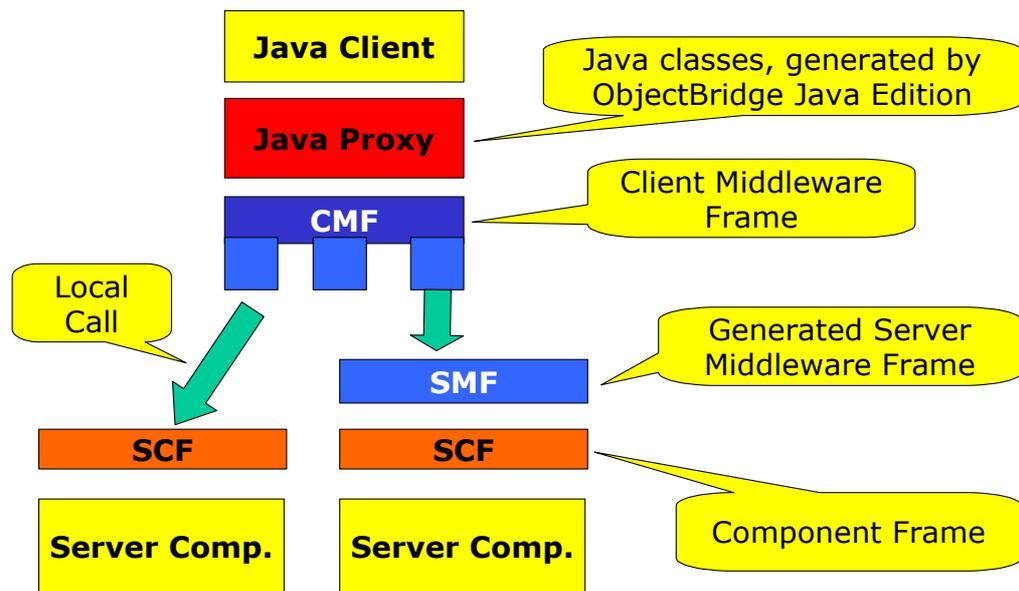
The Java Basic Classes Archive

In combination with ObjectBridge Java Edition, prefabricated Java classes are delivered in the form of a jar archive. These classes are used by generated Java proxy classes and contain, among others, data type conversion methods, transaction control methods and exception classes for error cases.

Middleware Interface

The call of remote servers depends on the middleware in use. For local server calls as well as for a middleware a Java interface has been created for (e.g. IBM CICS Java Gateway), the connection is completely provided in Java. Otherwise, additional libraries, working as an interface to the particular middleware, are delivered in combination with SCORE/Middleware Target.

A Client application can be developed middleware independent. That means, if the middleware is to be exchanged, no change in the Java client will occur.

Particular middleware specific server or host settings can be stored in a configuration file and evaluated during runtime.

```
┌─────────────────┐        ┌──────────────────────────┐
│   Java Client   │        │ Java classes, generated by│
└─────────────────┘        │  ObjectBridge Java Edition│
┌─────────────────┐        └──────────────────────────┘
│   Java Proxy    │◄───────
└─────────────────┘        ┌──────────────────────┐
┌─────────────────┐        │  Client Middleware   │
│      CMF        │◄───────│       Frame          │
└─┬───┬───┬───────┘        └──────────────────────┘
  │   │   │
┌──────┐                   ┌──────────────────────┐
│Local │                   │  Generated Server    │
│ Call │                   │  Middleware Frame    │
└──────┘        ┌──────────┐◄──────────────────────┘
                │   SMF    │
┌─────────┐     └──────────┘
│   SCF   │     ┌──────────┐
└─────────┘     │   SCF    │◄──┐
┌─────────┐     └──────────┘   │ ┌──────────────────┐
│ Server  │     ┌──────────┐   └─│ Component Frame  │
│  Comp.  │     │  Server  │     └──────────────────┘
└─────────┘     │   Comp.  │
                └──────────┘
```

Structure of local and remote server call from a Java application, developed with SCORE/Integration Suite

Procedure

Generation

The Component Repository (XML file) is the originator for a generation. This data file describes a server component and its interfaces. Java classes, generated from it, are collected in a package and have to be compiled before they can be called from client application.

Producing Java classes (proxies) on the base of the Component Repository.

Compile Process

When Sun uses JDK, the compile can be processed in Delta/Scout² directly. With other tools (e.g. IBM Visual Age), the produced Java sources will be imported into the development environment, if necessary. After that, the client application can call the server functions by the methods of these proxies. For this call, the generated and compiled Java proxies will be used.

Performance Increase

To reduce the calls between client and server, optimisations in form of request and response packaging can be specified for a component within the repository. The packaging is supported by proxies and, with that, can increase the performance of the application.

Generated Class Types

For each component repository of a server component, the ObjectBridge generator creates the following Java classes:
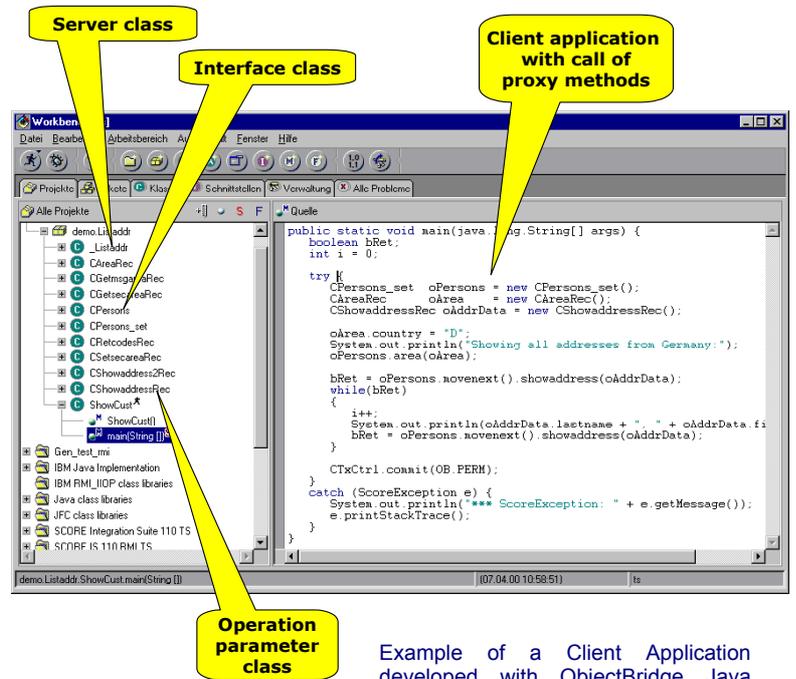
Server Class

For every server component, one server class will be generated. This class packs all Java method calls, creates signatures from it and calls the respective server component. In addition to this, it is also responsible for the optimised execution of operations (Request-/Response Packaging).

Interface Class

For every component interface, one Java class will be produced. This class contains Java methods for all operations provided by the interface.

Example of a Client Application developed with ObjectBridge Java Edition in an IBM Visual Age environment.

Operation Parameter Class

For each operation parameter, consisting of a structure, the generator will create a particular class. (Operation Parameter class.) This Java class contains all data elements of the operation parameter, defined as public fields of the type String. These fields are automatically converted into the server component data types and vice versa.

S y s t e m Requirements

... For generation environment:

Hardware At least 64 MB main memory	IBM-compatible PC with Pentium processor
Operating systems	Microsoft Windows® NT / 2000
Software	SCORE/Integration Suite 1.4 Delta/Scout² (recommended) SCORE/Development Suite (optional)

... For runtime environment:

Operating systems	Microsoft Windows® NT / 2000 Sun Solaris® further Unix Systems on inquiry
Software	Sun JDK 1.1.6 or higher compatible Java VM

MA 23956.02

www.d-s-t-g.com