BEA WebLogic Enterprise

CORBA, J2EE, and Tuxedo Interoperability and Coexistence

WebLogic Enterprise 5.0
Document Edition 5.0
December 1999

Copyright

Restricted Rights Legend

Trademarks or Service Marks

CORBA, J2EE, and Tuxedo Interoperability and Coexistence

Document Edition	Date	Software Version
5.0	December 1999	BEA WebLogic Enterprise 5.0

Contents

3. CORBA/C++-to-EJB Simpapp Sample Application

About This Document

This document provides details about how to build and run the suite of sample applications, which show how Enterprise JavaBeans and CORBA objects can coexist in the same WebLogic Enterprise application.

This document covers the following topics:

- Chapter 1, “Introduction,” provides a high-level overview of the interoperability and coexistence capabilities in the WebLogic Enterprise system among the CORBA, J2EE, and Tuxedo programming models. This chapter also describes the set of interoperability sample applications provided with the WebLogic Enterprise software.
- Chapter 2, “EJB-to-CORBA/Java Simpapp Sample Application,” describes how to build and run the EJB-CORBA/Java Simpapp sample application.
- Chapter 3, “CORBA/C++-to-EJB Simpapp Sample Application,” describes how to build and run the CORBA/C++-EJB Simpapp Sample Application.

What You Need to Know

This document is intended for programmers who are interested in creating secure, scalable, transaction-based server applications. It assumes you are knowledgeable with CORBA, Enterprise JavaBeans, and the C++ and Java programming languages.

e-docs Web Site

The BEA WebLogic Enterprise product documentation is available on the BEA corporate Web site. From the BEA Home page, click the Product Documentation button or go directly to the “e-docs” Product Documentation page at http://e-docs.beasys.com.

How to Print the Document

You can print a copy of this document from a Web browser, one file at a time, by using the File—>Print option on your Web browser.

A PDF version of this document is available on the WebLogic Enterprise documentation Home page on the e-docs Web site (and also on the documentation CD). You can open the PDF in Adobe Acrobat Reader and print the entire document (or a portion of it) in book format. To access the PDFs, open the WebLogic Enterprise documentation Home page, click the PDF Files button, and select the document you want to print.

If you do not have the Adobe Acrobat Reader, you can get it for free from the Adobe Web site at http://www.adobe.com/.

Related Information

For more information about CORBA, Java 2 Enterprise Edition (J2EE), BEA TUXEDO, distributed object computing, transaction processing, C++ programming, and Java programming, see the WLE Bibliography in the WebLogic Enterprise online documentation.

Contact Us!

Your feedback on the BEA WebLogic Enterprise documentation is important to us. Send us e-mail at **docsupport@beasys.com** if you have questions or comments. Your comments will be reviewed directly by the BEA professionals who create and update the WebLogic Enterprise documentation.

In your e-mail message, please indicate that you are using the documentation for the BEA WebLogic Enterprise 5.0 release.

If you have any questions about this version of BEA WebLogic Enterprise, or if you have problems installing and running BEA WebLogic Enterprise, contact BEA Customer Support through BEA WebSupport at www.beasys.com. You can also contact Customer Support by using the contact information provided on the Customer Support Card, which is included in the product package.

When contacting Customer Support, be prepared to provide the following information:

- Your name, e-mail address, phone number, and fax number
- Your company name and company address
- Your machine type and authorization codes
- The name and version of the product you are using
- A description of the problem and the content of pertinent error messages

Documentation Conventions

The following documentation conventions are used throughout this document.

Convention	Item
boldface text	Indicates terms defined in the glossary.
Ctrl+Tab	Indicates that you must press two or more keys simultaneously.

Convention	Item
italics	Indicates emphasis or book titles.

`monospace text`	Indicates code samples, commands and their options, data structures and their members, data types, directories, and file names and their extensions. Monospace text also indicates text that you must enter from the keyboard.
	Examples:
	`#include <iostream.h> void main ( ) the pointer psz`
	`chmod u+w *`
	`\tux\data\ap`
	`.doc`
	`tux.doc`
	`BITMAP`
	`float`

`monospace boldface text`	Identifies significant words in code. *Example*: `void` **`commit`** `( )`
`monospace italic text`	Identifies variables in code. *Example*: `String` *`expr`*
UPPERCASE TEXT	Indicates device names, environment variables, and logical operators. *Example*s: LPT1 SIGNON OR
`{ }`	Indicates a set of choices in a syntax line. The braces themselves should never be typed.

`[ ]`	Indicates optional items in a syntax line. The brackets themselves should never be typed.
	Example:
	`buildobjclient [-v] [-o name ] [-f` *`file-list`*`]...`
	`[-l` *`file-list`*`]...`

Convention	Item
|	Separates mutually exclusive choices in a syntax line. The symbol itself should never be typed.

. . .	Indicates one of the following in a command line:
	■ That an argument can be repeated several times in a command line
	■ That the statement omits additional optional arguments
	■ That you can enter additional parameters, values, or other information
	The ellipsis itself should never be typed.
	Example:
	`buildobjclient [-v] [-o name ] [-f file-list]...`
	`[-l file-list]...`

. . .	Indicates the omission of items from a code example or from a syntax line. The vertical ellipsis itself should never be typed.

1 Introduction

This chapter describes the interoperability and coexistence capabilities in the WebLogic Enterprise (WLE) system among the CORBA, J2EE, and Tuxedo programming models, and also describes the interoperability sample applications provided with the WLE software. The sample applications provide client and server programmers with information about the basic concepts of combining Enterprise JavaBeans (EJBs) and CORBA objects in the same WLE application.

This chapter does not discuss specific interoperability or coexistence details on the following topics:

- Security
- WebLogic Server and WLE Connectivity

Interoperability, Coexistence, and Transactions

In general, interoperability and coexistence among CORBA, J2EE, and Tuxedo entities in the WLE environment, with respect to transactions, is fully supported. BEA clients can initiate transactions that are propagated to and coordinated among CORBA objects, Tuxedo services, and EJBs in the WLE domain.

Note the following restrictions with regard to transactions and interoperability in the WLE system:

- Transactions can be fully coordinated among Tuxedo services, CORBA objects, and EJBs, with the following exceptions:

  - A CORBA/Java object may start a transaction that is propagated to a Tuxedo service, but a Tuxedo service cannot initiate a transaction that is propagated directly to a CORBA/Java object.
  - An EJB in the WLE system may start a transaction that is propagated to a Tuxedo service, but a Tuxedo service cannot initiate a transaction that is propagated directly to an EJB.

- WLE client applications cannot initiate, terminate, or coordinate transactions that span across EJBs and CORBA objects in the WLE domain.
- Third-party client applications cannot initiate, terminate, or coordinate transactions in the WLE domain. Such clients must delegate to the WLE domain all the processes and functions related to coordinating a transaction.

As a WLE application developer, you can use transaction policies with your EJBs, CORBA objects, and Tuxedo services to ensure the appropriate transactional behaviors of WLE server applications.

Interoperability Among the CORBA, J2EE, and Tuxedo Programming Models

The key interoperability features are presented in the following categories:

- BEA servers invoking BEA servers
- BEA clients invoking BEA servers
- Third-party interoperability

Note that BEA clients invoking other BEA clients is not supported.

BEA Servers Invoking BEA Servers

The following table summarizes the interoperability support among the various BEA server applications. A plus sign (+) means that full interoperability is supported.

Server Making Invocation	Server Being Invoked			
	Tuxedo Service	**CORBA C++ Object**	**CORBA Java Object**	**EJB**
Tuxedo Service	+	+	+	+
CORBA C++ Object	+(See below)	+	+	+(See below)
CORBA Java Object		+	+	+(See below)
EJB	+(See below)	+(See below)	+(See below)	+

Note the following details about the preceding table:

- *CORBA C++ object invoking a Tuxedo service*

  You can create a C++ object with a set of operations that map one-to-one with calls to Tuxedo services. See the Wrapper University sample application, available from the *Guide to the University Sample Applications*, for an example application that shows this feature.

- *CORBA C++ object invoking an EJB*

  You can create an intermediary, or wrapper, Java object between the C++ object and the EJB. See Chapter 3, "CORBA/C++-to-EJB Simpapp Sample Application," for an example application showing this feature.

- *CORBA Java object invoking an EJB*

  In the WLE environment, a CORBA Java object can invoke methods on an EJB directly. See Chapter 3, "CORBA/C++-to-EJB Simpapp Sample Application," for an example application that includes a CORBA Java object that invokes an EJB.

- *EJB invoking a Tuxedo service*

  For information, see a BEA Professional Services Organization representative.

- *EJB invoking a CORBA C++ object*

  Chapter 2, "EJB-to-CORBA/Java Simpapp Sample Application," shows an example of an EJB invoking a CORBA Java object. You can extend this example to include a CORBA C++ object by designing the Java object in that application to serve as an intermediary, or wrapper, object that delegates invocations from the EJB to the C++ object.

- *EJB invoking a CORBA Java object*

  In the WLE environment, an EJB can invoke a CORBA Java object directly. For an example, see Chapter 2, "EJB-to-CORBA/Java Simpapp Sample Application."

BEA Clients Invoking BEA Servers

The following table summarizes the interoperability support among BEA clients invoking BEA servers. A checkmark (+) means that full interoperability is supported.

Client Making Invocation	Server Being Invoked			
	Tuxedo Service	**CORBA C++ Object**	**CORBA Java Object**	**EJB**
WLE CORBA	+(See below)	+	+	+(See below)
WLE RMI		+(See below)	+(See below)	+
Tuxedo/WS	+	+(See below)	+(See below)	+(See below)

Note the following details about the preceding table:

- *WLE CORBA client application invoking a Tuxedo service*

  You can create a C++ client with a set of operations that map one-to-one with calls to Tuxedo services. See the Wrapper University sample application for an

example application that shows this feature. You can extend this example by converting the C++ server object into a WLE CORBA C++ client.

- *WLE CORBA client application invoking an EJB*

  Chapter 3, "CORBA/C++-to-EJB Simpapp Sample Application." shows an example of a C++ object invoking an EJB via a CORBA Java intermediary object.

- *WLE RMI client application invoking a CORBA C++ object*

  A WLE RMI client application can invoke a CORBA C++ object by using an EJB and a CORBA Java object in the server process as intermediaries. For an example, you can extend the sample application described in Chapter 2, "EJB-to-CORBA/Java Simpapp Sample Application," as follows:

  - The RMI client application invokes the EJB to initiate the request.
  - The Java object, which is invoked by the EJB, delegates the invocation to the C++ object.

- *WLE RMI client application invoking a CORBA Java object*

  A WLE RMI client application can invoke a CORBA Java object by using an EJB as an intermediary. For an example, you can extend the sample application descirbed in Chapter 2, "EJB-to-CORBA/Java Simpapp Sample Application," to have the RMI client application initiate the request instead of the EJB.

- *Tuxedo/WS client application invoking a CORBA C++ object*

  Interoperability is provided via a Tuxedo service wrapper. You create a Tuxedo service wrapper as a CORBA C++ object that runs in the WLE domain and that makes invocations on the legacy CORBA C++ object.

- *Tuxedo/WS client application invoking a CORBA Java object*

  Interoperability is provided via a Tuxedo service wrapper.

- *Tuxedo/WS client application invoking an EJB*

  Interoperability is provided via a Tuxedo service wrapper on a CORBA Java object in the server process, which then delegates the invocation to the EJB.

Third-party ORB Interoperability

The WLE C++ ORB supports the IIOP 1.2 protocol, and the WLE Java ORB supports the IIOP 1.0 protocol. Both ORBs interoperate with client products from other vendors that support the IIOP 1.2 (or earlier) protocol.

WLE provides transactional and security support for the following third-party client products. However, BEA does not provide environmental objects for these clients, so these products cannot directly access transactional and security capabilities inside the WLE domain. These client products can connect to a WLE server application using a stringified object reference.

- ActiveX
- Netscape Communicator
- Visibroker C++ Version 3.3 (not clients using the Visibroker Java ORB)
- Orbix 2.3c02 (with patch 26 or greater)

Overview of the Interoperability Sample Applications

The WLE software includes the sample applications described in Table 1-1:

Table 1-1 The Interoperability Sample Applications

Application	Description
EJB-to-CORBA/Java Simpapp	Shows an EJB server acting as a client invoking a request and receiving a response from a CORBA/Java object
CORBA/C++-to-EJB Simpapp	Shows CORBA/C++ client invoking a request and receiving a response from an EJB server

Use the interoperability sample applications in conjunction with the following documents:

- *Getting Started*
- *Guide to the University Sample Applications*
- *Guide to the Java Sample Applications*

2 EJB-to-CORBA/Java Simpapp Sample Application

The chapter discusses the following topics:

- How the EJB-to-CORBA/Java Simpapp sample application works
- Software prerequisites
- Building and running the EJB-to-CORBA/Java Simpapp sample application
- Stopping the EJB-to-CORBA/Java Simpapp sample application

Note: Each sample application directory tree provided with the WLE software includes a `Readme.txt` file that explains how to build and run the sample. Refer to this file in the following directory for troubleshooting information or other last-minute information about using the EJB-to-CORBA/Java sample application:

Window NT:

```
$TUXDIR\samples\interop\ejb_corbaj
```

UNIX:

```
$TUXDIR/samples/interop/ejb_corbaj
```

How the EJB-to-CORBA/Java Simpapp Sample Application Works

The EJB-to-CORBA/Java Simpapp sample application has an EJB client, an EJB server deploying the `SimpBean` EJB and an EJB-to-CORBA bridge object, and a CORBA server deploying a CORBA object.

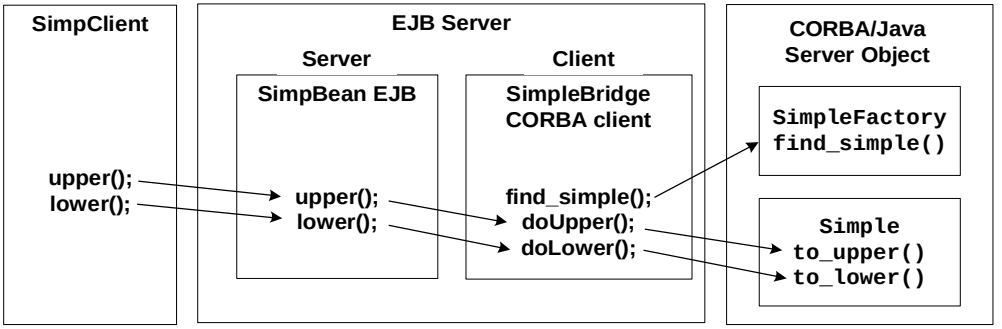
The `SimpBean` EJB has the following two remote methods:

- The `upper` method delegates invocations to the `to_upper` method on the CORBA Simple object
- The `lower` method method delegates invocations to the `to_lower` method on the CORBA Simple object

The CORBA Simple object has the following two methods:

- The `to_upper` method accepts a string from the bridge object and converts the string to uppercase letters.
- The `to_lower` method accepts a string from the bridge object and converts the string to lowercase letters.

The following figure illustrates how the EJB-to-CORBA/Java Simpapp sample application works.



Software Prerequisites

To run the `m3idltojava` compiler that is used by the EJB-to-CORBA/Java Simpapp sample application, you need to install Visual C++ Version 6.0 with Service Pack 3 or later for Visual Studio. The `m3idltojava` compiler is installed by the WLE software in the `bin` directory under `TUXDIR`.

Implementing the Bridge Object to Invoke a CORBA/Java Object

The `SimpleBridge` Java object implements bridge design pattern. This object serves as a bridge between the `SimpBean` EJB and the CORBA/Java `Simple` object, and it is created by the `SimpBean` EJB.

The `SimpleBridge` Java object performs the following functions:

- Uses the Bootstrap object to obtain a reference to the WLE FactoryFinder, from which the `SimpleBridge` object can obtain a reference to the `SimpleFactory` object
- Invokes the `SimpleFactory` object to obtain a reference to the `Simple` object
- Invokes the appropriate methods on the `Simple` object to satisfy the `SimpBean`'s requests.

The following code fragment shows the methods on the `SimpleBridge` object that delegate the `SimpBean`'s requests to the CORBA/Java `Simple` object:

```
public class SimpleBridge
{
  private Simple simple = null;

  public SimpleBridge ()
  {
    simple = getSimple();
  }

  public String doUpper(String mixedStr)
  {
    // Convert the string to upper case.
    org.omg.CORBA.StringHolder upperStr =
```

```
        new org.omg.CORBA.StringHolder(mixedStr);
      simple.to_upper(upperStr);

      System.out.println("in SimpleBridge.doUpper()");
      return upperStr.value;
    }


    public String doLower(String mixedStr)
    {
      // Convert the string to lower case.
      String lowerStr = simple.to_lower(mixedStr);

      System.out.println("in SimpleBridge.doLower()");
      return lowerStr;
    }


    public Simple getSimple()
    {
      try {
        // Obtain the bootstrap object,
       // the TOBJADDR property contains host and port to connect to.
        Tobj_Bootstrap bootstrap = TP.bootstrap();

        // Use the bootstrap object to find the factory finder.
        org.omg.CORBA.Object fact_finder_oref =
          bootstrap.resolve_initial_references("FactoryFinder");

        // Narrow the factory finder.
        FactoryFinder fact_finder_ref =
          FactoryFinderHelper.narrow(fact_finder_oref);

        // Use the factory finder to find the simple factory.
        org.omg.CORBA.Object simple_fact_oref =

  fact_finder_ref.find_one_factory_by_id(SimpleFactoryHelper.id());

        // Narrow the simple factory.
        SimpleFactory simple_factory_ref =
          SimpleFactoryHelper.narrow(simple_fact_oref);

        // Find the simple object.
        Simple simple = simple_factory_ref.find_simple();

        // everything succeeded.
        return simple;
      }
      // catch the exceptions
```

```
        return null;
      }
    }
```

The OMG IDL Code for the EJB-to-CORBA/Java Simpapp Interfaces

The sample application described in this chapter implements the CORBA interfaces listed in the following table.

Interface	Description	Operation	Policies
`SimpleFactory`	Creates object references to the Simple object	`find_simple()`	Activation: `method` Transaction: `optional`
`Simple`	Converts the case of a string	`to_upper()` `to_lower()`	Activation: `method` Transaction: `optional`

Listing 2-1 shows the `simple.idl` file that defines the CORBA interfaces in the EJB-to-CORBA/Java Simpapp sample application.

Listing 2-1 OMG IDL Code for the EJB-to-CORBA/Java Simpapp Sample Application

```
#pragma prefix "beasys.com"

interface Simple
{
    //Convert a string to lower case (return a new string)
    string to_lower(in     string val);

    //Convert a string to upper case (in place)
    void to_upper(inout string val);
};

interface SimpleFactory
{
```

```
    Simple find_simple();
};
```

Building and Running the EJB-to-CORBA/Java Simpapp Sample Application

Perform the following steps to build and run the EJB-to-CORBA/Java Simpapp sample application:

1. Verify the environment variables.
2. Copy the files for the EJB-to-CORBA/Java Simpapp sample application into a work directory.
3. Change the protection attribute on the files for the EJB-to-CORBA/Java Simpapp sample application.
4. Execute the `runme` command.

The following sections describe these steps, and also explain the following:

- How to run the EJB-to-CORBA/Java Simpapp sample application
- Processes and files created by the EJB-to-CORBA/Java Simpapp sample application

Verifying the Settings of the Environment Variables

Before building and running the EJB-to-CORBA/Java Simpapp sample application, you need to ensure that certain environment variables are set on your system. In most cases, these environment variables are set as part of the installation procedure. However, you need to check the environment variables to ensure they reflect correct information.

Table 2-1 lists the environment variables required to run the EJB-to-CORBA/Java Simpapp sample application.

Table 2-1 Required Environment Variables for the EJB-to-CORBA/Java Simpapp Sample Application

Environment Variable	Description

TUXDIR	The directory path where you installed the WLE software. For example:
	Windows NT
	`TUXDIR=c:\WLEdir`
	UNIX
	`TUXDIR=/usr/local/WLEdir`

JAVA_HOME	The directory path where you installed the JDK software. For example:
	Windows NT
	`JAVA_HOME=c:\JDK1.2.2`
	UNIX
	`JAVA_HOME=/usr/local/JDK1.2.1`

You may optionally set the following system environment variables to change their default value prior to running the EJB-to-CORBA/Java Simpapp sample application `runme` command. See the *Administration Guide* for more information about selecting appropriate values for these environment variables.

Table 2-2 lists the optional environment variables required to run the EJB-to-CORBA/Java Simpapp sample application.

Table 2-2 Optional Environment Variables for the EJB-to-CORBA/Java Simpapp Sample Application

Environment Variable	Description
HOST	The host name portion of the TCP/IP network address used by the ISL process to accept connections from CORBA. The default value is the name of the local machine.

Environment Variable	Description
PORT	The TCP port number at which the ISL process listens for incoming requests; it must be a number between 0 and 65535. The default value is 2468.
IPCKEY	The address of shared memory; the address must be a number greater than 32769 unique to this application on this system. The default value is 55432.

Verifying the Environment Variables

To verify that the information for the environment variables defined during installation is correct, perform the following steps:

Windows NT:

1. From the Start menu, select Settings.
2. From the Settings menu, select the Control Panel.

   The Control Panel appears.
3. Click the System icon.

   The System Properties window appears.
4. Click the Environment tab.

   The Environment page appears.
5. Check the settings for TUXDIR and JAVA_HOME.

UNIX:

1. Enter the ksh command to use the Korn shell.
2. Enter the printenv command to display the values of TUXDIR and JAVA_HOME, as in the following example:

```
ksh prompt>printenv TUXDIR
ksh prompt>printenv JAVA_HOME
```

Changing the Environment Variables

To change the environment variable settings, perform the following steps:

Windows NT:

1. From the Start menu, select Settings.
2. From the Settings menu, select the Control Panel.

   The Control Panel appears.
3. Click the System icon.

   The System Properties window appears.
4. Click the Environment tab.

   The Environment page appears.
5. On the Environment page in the System Properties window, click the environment variable you want to change or enter the name of the environment variable in the Variable field.
6. Enter the correct information for the environment variable in the Value field.
7. Click OK to save the changes.

UNIX:

1. Enter the `ksh` command to use the Korn shell.
2. Enter the `export` command to set the correct values for the `TUXDIR` and `JAVA_HOME` environment variables, as in the following example:

```
ksh prompt>export TUXDIR=directorypath
ksh prompt>export JAVA_HOME=directorypath
```

Copying the Files for the Java Simpapp Sample Application into a Work Directory

You need to copy the files for the EJB-to-CORBA/Java Simpapp sample application into a work directory on your local machine. The files for the EJB-to-CORBA/Java Simpapp sample application are located in the following directories under TUXDIR:

Windows NT:

```
$TUXDIR\samples\interop\ejb_corbaj
```

UNIX:

```
$TUXDIR/samples/interop/ejb_corbaj
```

The following steps describe how to execute a makefile to copy all the example files into a work directory.

1. Create the work directory on your machine.
2. Copy the entire `ejb_corbaj` directory to the working directory created in the previous step:

Windows NT:

```
> copy $TUXDIR\samples\interop\ejb_corbaj\*.* <work_directory>
```

UNIX:

```
> cp -R $TUXDIR/samples/interop/ejb_corbaj/* <work_directory>
```

3. Change to the working directory created in step 1.
4. Enter the following command, which copies the remaining EJB-to-CORBA/Java Simpapp sample application files to the working directory:

   Windows NT:

   ```
   >nmake -f makefile.nt copy
   ```

   UNIX:

   ```
   >make -f makefile.mk copy
   ```

Files in the Working Directory

This section lists and describes the files copied into your working directory after you have performed the steps described in the previous section.

The EJB-to-CORBA/Java Simpapp sample application files exist in the following sets:

- EJB Simpapp files
- CORBA/Java Simpapp files

- EJB-to-CORBA/Java utility files

Table 2-3 lists and describes the source files for the EJB portion of this sample application. These are the files that exist after you do the make command. These files are copied into a subdirectory named `ejb`.

Table 2-3 EJB Simpapp Files

File	Description
`ejb-jar.XML`	The standard deployment descriptor for the `SimpBean` class.
`weblogic-ejb-extensions.XML`	The XML file specifying the WebLogic EJB extensions to the deployment descriptor DTD.
`SimpClient.Java`	The EJB Simpapp client.
`SimpBean.java`	The `SimpBean` class. This is an example of a stateless session bean. This bean contains the methods that invoke the `SimpleBridge` class to delegate the invocations on the `Simple` CORBA/Java object.
`Simp.java`	The Remote interface of the `SimpBean` class.
`SimpHome.Java`	The Home interface of the `SimpBean` class.

Table 2-4 lists and describes the source files for the CORBA/Java portion of this sample application. They are copied into a subdirectory named `corbaj`.

Table 2-4 CORBA/Java Simpapp Files

File	Description
`Simple.idl`	The OMG IDL that declares the `SimpleFactory` and `Simple` interfaces.
`Simple.xml`	The Server Description File for the `Simple` CORBA object.

File	Description
SimpleBridge.Java	The EJB-to-CORBA/Java Simpapp SimpleBridge class. This class is used by the SimpBean class to communicate with the CORBA/Java Simple object. This is the class that effects the interoperability between the EJB and the CORBA/Java object.
ServerImpl.Java	The implementation of the Server.initialize and Server.release methods.
SimpleFactoryImpl.Java	The implementation of the SimpleFactory methods.
SimpleImpl.Java	The implementation of the Simple methods.

Table 2-5 lists and describes the utility files for this sample application.

Table 2-5 EJB-to-CORBA/Java Utility Files

File	Description
Readme.txt	Contains directions for building and executing the EJB-to-CORBA/Java Simpapp sample application.
runme.cmd	The Windows NT batch file that contains commands to build and execute the EJB-to-CORBA/Java Simpapp sample application.
runme.ksh	The UNIX Korn shell script that contains commands to build and execute the EJB-to-CORBA/Java Simpapp sample application.
makefile.nt	The common makefile for the EJB-to-CORBA/Java Simpapp sample application on the Windows NT platform. This makefile can be used directly by the Visual C++ nmake command. The makefile.nt file is included by the smakefile.nt file.
smakefile.nt	The makefile for the EJB-to-CORBA/Java Simpapp sample application to be used by Symantec's Visual Café smake program.

File	Description
makefile.mk	The makefile for the EJB-to-CORBA/Java Simpapp sample application on the UNIX platform.

Changing the Protection Attribute on the Files for the EJB-to-CORBA/Java Simpapp Sample Application

During the installation of the WLE software, the sample application files are marked read-only. Before you can edit or build the files in the EJB-to-CORBA/Java Simpapp sample application, you need to change the protection attribute of the files you copied into your work directory (including the respective `ejb` and `corbaj` subdirectories), as follows:

Windows NT:

```
prompt>attrib /S -r drive:\workdirectory\*.*
```

UNIX:

```
prompt>/bin/ksh

ksh prompt>chmod +w /workdirectory/*.*
```

On the UNIX operating system platform, you also need to change the permission of `runme.ksh` to give execute permission to the file, as follows:

```
ksh prompt>chmod +x runme.ksh
```

Executing the runme Command

The `runme` command automates the following steps:

1. Setting the system environment variables
2. Loading the `UBBCONFIG` file
3. Compiling the code for the EJB server object
4. Compiling the code for the CORBA/Java server application

5. Starting the server application using the `tmboot` command
6. Starting the client application
7. Stopping the server application using the `tmshutdown` command

To build and run the EJB-to-CORBA Simpapp sample application, enter the `runme` command, as follows:

Windows NT:

```
prompt>cd workdirectory

prompt>runme
```

UNIX:

```
ksh prompt>cd workdirectory

ksh prompt>./runme.ksh
```

The EJB-to-CORBA/Java Simpapp sample application runs and prints the following messages:

```
Testing simpapp
    cleaned up
    prepared
    built
    loaded ubb
    booted
    ran
    shutdown
    saved results
  PASSED
```

All of the sample application output is placed in the `results` directory, which is located in the `ejb_corbaj` working directory. You can check in the `results` directory for the following files:

- The `log` file, for any compile, server boot, or server shutdown errors
- The `ULOG` file for server application errors and exceptions
- The `output` file for EJB client application output and exceptions

Running the Sample Application

After you have executed the `runme` command, you can run the EJB-to-CORBA/Java Simpapp sample application manually if you like.

To manually run the EJB-to-CORBA/Java Simpapp sample application:

1. Verify that your environment variables are correct by entering the following command:

   Windows NT:

   ```
   prompt>results\setenv
   ```

   UNIX:

   ```
   prompt>. results/setenv.ksh
   ```

2. Run the sample, as follows:

   Windows NT:

```
prompt>tmboot -y
prompt>java -classpath %CLIENTCLASSPATH% ejb.SimpClient corbaloc:%TOBJADDR%
```

   UNIX:

```
prompt>tmboot -y
prompt>java -classpath ${CLIENTCLASSPATH} ejb.SimpClient corbaloc:${TOBJADDR}
```

3. The EJB-to-CORBA/Java Simpapp sample application prompts you to enter a string. After you enter the string, the application returns the string in uppercase and lowercase characters, respectively:

   ```
   String?
   Hello World
   HELLO WORLD
   hello world
   ```

All of the sample application output is placed in the `results` directory. You can check in that directory for the following files:

- The `.log` file, for any compile, server boot, or server shutdown errors
- The `ULOG` file for server application errors and exceptions
- The `output` file for EJB client application output and exceptions

Processes and Files Generated by the EJB-to-CORBA/Java Simpapp Sample Application

This section lists and describes the processes started and the files generated by the EJB-to-CORBA/Java Simpapp sample application.

Processes Started

When the `tmboot` command is executed to start the EJB-to-CORBA/Java Simpapp sample application, the following server processes are started:

Process	Description
TMSYSEVT	The BEA Tuxedo system Event Broker.
TMFFNAME	Starts the following TMFFNAME processes: ■ The TMFFNAME server process with the `-N` option and the `-M` option is the MASTER `NameManager` service. The `-N` option says to start the NameManager Service; the `-M` option says to start this name manager as a Master. This service maintains a mapping of application-supplied names to object references. ■ The TMFFNAME server process with the `-N` option only is a SLAVE `NameManager` service. ■ The TMFFNAME server with the `-F` option contains the `FactoryFinder` object.
JavaServer	The JavaServer process that deploys the `SimpBean` EJB and hosts the implementation of the `SimpBridge` CORBA object. The JavaServer takes one argument, `SimpleEjb.jar`, which is the module for the `SimpBean` EJB.
JavaServer	The JavaServer process which deploys the `Simple` CORBA object (the deployment of this process also includes the `SimpleFactory` factory for the `Simple` object). The JavaServer takes one argument, `SimpleCorba.jar`, which is the module for the `Simple` CORBA object.
ISL	The IIOP Listener/Handler.

Files Generated in the corbaj Directory

The following table lists and describes the files that are generated in the `corbaj` working directory.

File	Description
`Simple.java`	Generated by the `m3idltojava` command for the `Simple` interface. This interface contains the Java version of the IDL interface. It extends the `org.omg.CORBA.Object` class.
`SimpleHelper.java`	Generated by the `m3idltojava` command for the `Simple` interface. This class provides auxiliary functionality, notably the narrow method.
`SimpleHolder.java`	Generated by the `m3idltojava` command for the `Simple` interface. This class holds a public instance member of type `Simple`. It provides operations for `out` and `inout` arguments, which CORBA has, but which do not map easily to Java's semantics.
`_SimpleImplBase.java`	Generated by the `m3idltojava` command for the `Simple` interface. This abstract class is the server skeleton. It implements the `Simple.java` interface. The server class `SimpleImpl` extends `_SimpleImplBase`.
`_SimpleStub.java`	Generated by the `m3idltojava` command for the `Simple` interface. This class is the client stub. It implements the `Simple.java` interface.

`SimpleFactory.java`
`SimpleFactoryHelper.java`
`SimpleFactoryHolder.java`
`_SimpleFactoryImplBase.java`
`_SimpleFactoryStub.java`
	Generated by the `m3idltojava` command for the `SimpleFactory` interface.

`Simple.ser`	The server descriptor file that is generated by the `buildjavaserver` command.

File	Description
Simple.jar	The Java archive file that is generated by the buildjavaserver command.

File Generated in the ejb_corbaj Directory

The following file is generated in the ejb_corbaj directory:

results directory	Generated by the runme comand.
.adm/.keydb	Generated by the tmloadcf command. Contains the security encryption key database.

Files Generated in the results Directory

The following table lists and describes the files that are generated in the results directory, which is a subdirectory of the ejb_corbaj working directory.

File	Description
input	Generated by the runme command. Contains the input that runme gives to the SimpleClient Java application.
output	Generated by the runme command. Contains the output that is produced when runme executes the SimpleClient Java application.
expected_output	Generated by the runme command. Contains the output that is expected when the SimpleClient Java application is executed by the runme command. The data in the output file is compared with the data in the expected_output file to determine whether the test passed or failed.
log	Generated by the runme command. Contains the output generated by the runme command. If the runme command fails, check this file and the ULOG file for errors.

File	Description
`setenv.cmd`	Generated by the Windows NT `runme.cmd` command. Contains the commands to set the environment variables needed to build and execute the EJB-to-CORBA/Java Simpapp sample application.
`setenv.ksh`	Generated by the UNIX `runme.ksh` command. Contains the commands to set the environment variables needed to build and execute the `Simpapp` sample.
`stderr`	Generated by the `tmboot` command, which is executed by the `runme` command. If the `-noredirect` server option is specified in the `UBBCONFIG` file, the `System.err.println` method sends the output to the `stderr` file instead of to the `ULOG` user log file.
`stdout`	Generated by the `tmboot` command, which is executed by the `runme` command. If the `-noredirect` server option is specified in the `UBBCONFIG` file, the `System.out.println` method sends the output to the `stdout` file instead of to the `ULOG` user log file
`tmsysevt.dat`	Generated by the `tmboot` command, which is executed by the `runme` command. It contains filtering and notification rules used by the `TMSYSEVT` (system event reporting) process.
`tuxconfig`	Generated by the `tmloadcf` command, which is executed by the `runme` command.
`ubb`	The `UBBCONFIG` file for the EJB-to-CORBA/Java Simpapp sample application.
`ULOG.<`*`date`*`>`	A log file that contains messages generated by the `tmboot` command. If there are any compile or run-time errors, check this file.

Stopping the EJB-to-CORBA/Java Simpapp Sample Application

Before using another sample application, use the following procedure to stop the EJB-to-CORBA/Java Simpapp sample application and to remove unnecessary files from the work directory.

1. Stop the application:

   Windows NT:

   ```
   prompt>tmshutdown -y
   ```

   UNIX:

   ```
   ksh prompt>tmshutdown -y
   ```

2. Restore the working directory to its original state:

   Windows NT:

   ```
   prompt>nmake -f makefile.nt clean
   ```

   UNIX:

   ```
   prompt>. ./results/setenv.ksh
   prompt>make -f makefile.nt clean
   ```

3. If Symantec's Visual Café is installed on your system, you can use the `smakefile.nt` file rather than the `makefile.nt` file, which is intended for use with the Visual C++ `nmake` program. For example, execute the following commands:

   ```
   prompt>results\setenv
   prompt>set JDKDIR=%JAVA_HOME%
   prompt>smake -f smakefile.nt
   ```

3 CORBA/C++-to-EJB Simpapp Sample Application

This chapter discusses the following topics:

- How the CORBA/C++-to-EJB sample application works
- Software prerequisites
- The OMG IDL code for the CORBA/C++-to-EJB Simpapp interfaces
- Building and running the CORBA/C++-to-EJB Simpapp sample application
- Stopping the CORBA/C++-to-EJB Simpapp sample application

Note: Each sample application directory tree provided with the WLE software includes a `Readme.txt` file that explains how to build and run the sample. Refer to this file in the following directory for troubleshooting information or other last-minute information about using the CORBA/C++-to-EJB Simpapp sample application.

Windows NT:

```
$TUXDIR\samples\interop\cpp_ejb
```

UNIX:

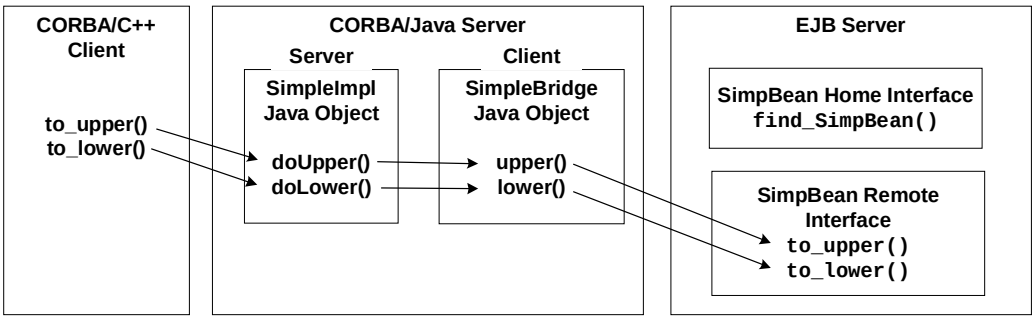
```
$TUXDIR/samples/interop/cpp_ejb
```

How the CORBA/C++-to-EJB Simpapp Sample Application Works

The CORBA/C++-to-EJB Simpapp sample application features the following:

- A CORBA/C++ client application.
- A CORBA/Java server application acting as a liaison between the C++ client application and an EJB server. Contains SimpleImpl object, and the SimpleBridge Java object
- An EJB server that provides the following two operations:
  - One operation accepts a string from the client and converts the string to uppercase letters.
  - Another operation that accepts a string from the client and converts the string to lowercase letters.

The following figure illustrates how the CORBA/C++-to-EJB Simpapp sample application works.



Software Prerequisites

To run the `m3idltojava` compiler that is used by the CORBA/C++-to-EJB Simpapp sample application, you need to install Visual C++ Version 6.0 with Service Pack 3 or later for Visual Studio. The `m3idltojava` compiler is installed by the WLE software in the `bin` directory under `TUXDIR`.

Implementing the Bridge Object to Invoke an EJB

The `SimpleBridge` Java object serves as the intermediary between the CORBA/Java server and the EJB server application. The SimpleBridge Java object is created by the SimpleImpl Java object. The `SimpleBridge` Java object performs the following functions:

- Obtains the initial context for the EJB server application.
- Performs a lookup on the EJB Home interface.
- Invokes the appropriate methods on the `SimpBean` class to satisfy the client application requests.

The following code fragment shows the methods on the `SimpleBridge` object that delegate the `SimpleImpl`'s requests to the EJB server application:

```
public class SimpBridge {


  public String doUpper(String mixedStr)
  {
    String upperStr = "";
   javax.naming.Context ctx = null;
    SimpHome home = null;

    try {
      // create connection
      ctx = getContext();

      // look up home object
      home = (SimpHome) ctx.lookup("ejb.SimpHome");

      // create the object and use it
      Simp simp = home.create();
```

```
    upperStr = simp.upper(mixedStr);
  } // catch exceptions
  }

  return upperStr;
}


public String doLower(String mixedStr)
{
  String lowerStr = "";
  javax.naming.Context ctx = null;
  SimpHome home = null;

  try {
    // create connection
    ctx = getContext();

    // look up home object
    home = (SimpHome) ctx.lookup("ejb.SimpHome");

    // create the object and use it
    Simp simp = home.create();
    lowerStr = simp.lower(mixedStr);
  } // catch exceptions
  }

  return lowerStr;
}


public static Context getContext()
{
  Context context = null;

  Hashtable env = new Hashtable();
  env.put(Context.INITIAL_CONTEXT_FACTORY,
    "com.beasys.jndi.WLEInitialContextFactory");
  env.put(Context.SECURITY_AUTHENTICATION, "none");

  try {
    context = new InitialContext(env);
  } catch (NamingException ee) {
    System.out.println("getContext failed: " + ee);
    ee.printStackTrace();
  }

  return context;
```

```
  }
}
```

The OMG IDL Code for the CORBA/C++-to-EJB Simpapp Interfaces

The C++ and Java objects in the sample application described in this chapter implement the CORBA interfaces listed in the following table.

Interface	Description	Operation	Policies
`SimpleFactory`	Creates object references to the Simple object.	`find_simple()`	Activation: `method` Transaction: `optional`
`Simple`	Delegates the conversion of the string to the EJB server.	`to_upper()` `to_lower()`	Activation: `method` Transaction: `optional`

Listing 3-1 shows the `simple.idl` file that defines the CORBA interfaces in the CORBA/C++-to-EJB Simpapp sample application.

Listing 3-1 OMG IDL Code for the CORBA/C++-to-EJB Simpapp Sample Application

```
#pragma prefix "beasys.com"

interface Simple
{
    //Convert a string to lower case (return a new string)
    string to_lower(in     string val);

    //Convert a string to upper case (in place)
    void to_upper(inout string val);
};

interface SimpleFactory
{
```

```
    Simple find_simple();
};
```

Building and Running the CORBA/C++-to-EJB Simpapp Sample Application

Perform the following steps to build and run the CORBA/C++-to-EJB Simpapp sample application:

1. Verify the environment variables.
2. Copy the files for the CORBA/C++-to-EJB Simpapp sample application into a work directory.
3. Change the protection attribute on the files for the CORBA/C++-to-EJB Simpapp sample application.
4. Execute the `runme` command.

The following sections describe these steps, and also explain the following:

- How to run the CORBA/C++-to-EJB Simpapp sample application
- Processes and files generated by the CORBA/C++-to-EJB Simpapp sample application

Verifying the Settings of the Environment Variables

Before building and running the CORBA/C++-to-EJB Simpapp sample application, you need to ensure that certain environment variables are set on your system. In most cases, these environment variables are set as part of the installation procedure. However, you need to check the environment variables to ensure they reflect correct information.

Table 3-1 lists the environment variables required to run the CORBA/C++-to-EJB Simpapp sample application.

Table 3-1 Required Environment Variables for the CORBA/C++-to-EJB Simpapp Sample Application

Environment Variable	Description

`TUXDIR`	The directory path where you installed the WLE software. For example:
	Windows NT
	`TUXDIR=c:\WLEdir`
	UNIX
	`TUXDIR=/usr/local/WLEdir`

`JAVA_HOME`	The directory path where you installed the JDK software. For example:
	Windows NT
	`JAVA_HOME=c:\JDK1.2.2`
	UNIX
	`JAVA_HOME=/usr/local/JDK1.2.1`

You may optionally set the following system environment variables to change their default value prior to running the CORBA/C++-to-EJB Simpapp sample `runme` command. See the *Administration Guide* for more information about selecting appropriate values for these environment variables.

Table 3-2 lists the optional environment variables you can assign prior to running the CORBA/C++-to-EJB Simpapp sample application.

Table 3-2 Optional Environment Variables for the CORBA/C++-to-EJB Simpapp Sample Application

Environment Variable	Description
`HOST`	The host name portion of the TCP/IP network address used by the ISL process to accept connections from CORBA. The default value is the name of the local machine.

Environment Variable	Description
PORT	The TCP port number at which the ISL process listens for incoming requests; it must be a number between 0 and 65535. The default value is 2468.
IPCKEY	The address of shared memory; it must be a number greater than 32769 unique to this application on this system. The default value is 55432.

Verifying the Environment Variables

To verify that the information for the environment variables defined during installation is correct, perform the following steps:

Windows NT:

1. From the Start menu, select Settings.
2. From the Settings menu, select the Control Panel.

   The Control Panel appears.
3. Click the System icon.

   The System Properties window appears.
4. Click the Environment tab.

   The Environment page appears.
5. Check the settings for `TUXDIR` and `JAVA_HOME`.

UNIX:

1. Enter the `ksh` command to use the Korn shell.
2. Enter the `printenv` command to display the values of `TUXDIR` and `JAVA_HOME`, as in the following example:

```
ksh prompt>printenv TUXDIR
ksh prompt>printenv JAVA_HOME
```

Changing the Environment Variables

To change the environment variable settings, perform the following steps:

Windows NT:

1. From the Start menu, select Settings.
2. From the Settings menu, select the Control Panel.

   The Control Panel appears.
3. Click the System icon.

   The System Properties window appears.
4. Click the Environment tab.

   The Environment page appears.
5. On the Environment page in the System Properties window, click the environment variable you want to change or enter the name of the environment variable in the Variable field.
6. Enter the correct information for the environment variable in the Value field.
7. Click OK to save the changes.

UNIX:

1. Enter the `ksh` command to use the Korn shell.
2. Enter the `export` command to set the correct values for the `TUXDIR` and `JAVA_HOME` environment variables, as in the following example:

```
ksh prompt>export TUXDIR=directorypath
ksh prompt>export JAVA_HOME=directorypath
```

Copying the Files for the CORBA/C++-to-EJB Simpapp Sample Application into a Work Directory

You need to copy the files for the CORBA/C++-to-EJB Simpapp sample application into a work directory on your local machine. The files for the CORBA/C++-to-EJB Simpapp sample application are located in the following directories.

Windows NT:

```
$TUXDIR\samples\interop\cpp_ejb
```

UNIX:

```
$TUXDIR/samples/interop/cpp_ejb
```

The following steps describe how to execute a makefile to copy all the example files into a work directory.

1. Create the work directory on your machine.
2. Copy the entire `cpp_ejb` directory to the working directory created in the previous step:

Windows NT:

```
> copy $TUXDIR\samples\interop\cpp_ejb\*.* <work_directory>
```

UNIX:

```
> cp -R $TUXDIR/samples/interop/cpp_ejb/* <work_directory>
```

3. Change to the working directory created in step 1.
4. Enter the following command, which copies the remaining EJB-to-CORBA/Java Simpapp sample application files to the working directory:

   Windows NT:

   ```
   >nmake -f makefile.nt copy
   ```

   UNIX:

   ```
   >make -f makefile.mk copy
   ```

Files in the Working Directory

This section lists and describes the files copied into your working directory after you have performed the steps described in the previous section.

The CORBA/C++-to-EJB Simpapp sample application files exist in the following sets:

- CORBA C++ and Java source files
- EJB source files

- CORBA/C++-to-EJB Simpapp utility files

Table 3-3 lists and describes the files needed to create the CORBA/C++ client. Also included are the files needed to create the CORBA/Java server that acts as a bridge for the CORBA/C++-to-EJB Simpapp sample application. These files are located in the `cpp` subdirectory.

Table 3-3 CORBA C++ and Java Files for the CORBA/C++-to-EJB Simpapp Sample Application

File	Description
`simplec.cpp`	C++ client program for the `simple` sample application.
`simple.idl`	The OMG IDL that declares the `SimpleFactory` and `Simple` interfaces.
`simple.xml`	The XML source file used to associate activation and transaction policy values with interfaces.
`ServerImpl.Java`	The Java source code that implements the `Server.initialize` and `Server.release` methods.
`SimpleFactoryImpl.Java`	The Java source code that implements the `SimpleFactory` methods.
`SimpleImpl.Java`	The Java source code that implements the `Simple` methods.

Table 3-4 lists and describes the files needed to create the EJB server for the CORBA/C++-to-EJB Simpapp sample application. These files are located in the `ejb` subdirectory.

Table 3-4 EJB Source Files for the CORBA/C++-to-EJB Simpapp Sample Application

File	Description
`weblogic-ejb-extensions.XML`	The XML file specifying the WebLogic EJB extensions to the deployment descriptor DTD.

File	Description
SimpBean.java	The Java source code for the SimpBean class. This is an example of a stateless session bean. This bean contains the methods that invoked by the SimpleBridge class.
Simp.java	The Java source code for the Remote interface of the SimpBean class.
SimpHome.Java	The Java source code for the Home interface of the SimpBean class.
SimpleBridge.java	The Java source code for the SimpleBridge class. This class is used by the SimpleImpl class to communicate with the EJB server. This is the class that effects the interoperability between the CORBA/C++ object and the EJB server.

Table 3-5 lists and describes the utility files for this sample application.

Table 3-5 CORBA/C++-to-EJB Simpapp Utility Files

File	Description
Readme.txt	Contains directions for building and executing the CORBA/C++-to-EJB Simpapp sample application.
runme.cmd	The Windows NT batch file that contains commands to build and execute the CORBA/C++-to-EJB Simpapp sample application.
runme.ksh	The UNIX Korn shell script that contains commands to build and execute the CORBA/C++-to-EJB Simpapp sample application.
makefile.nt	The common makefile for the CORBA/C++-to-EJB Simpapp sample application on the Windows NT platform. This makefile can be used directly by the Visual C++ nmake command. The makefile.nt file is included by the smakefile.nt file.

File	Description
`smakefile.nt`	The makefile for the CORBA/C++-to-EJB Simpapp sample application to be used by Symantec's Visual Café `smake` program.
`makefile.mk`	The makefile for the CORBA/C++-to-EJB Simpappp sample application on the UNIX platform.

Changing the Protection Attribute on the Files for the CORBA/C++-to-EJB Simpapp Sample Application

During the installation of the WLE software, the sample application files are marked read-only. Before you can edit or build the files in the CORBA/C++-to-EJB Simpapp sample application, you need to change the protection attribute of the files you copied into your work directory (including the respective `ejb` and `corbaj` subdirectories), as follows:

Windows NT:

```
prompt>attrib /S -r drive:\workdirectory\*.*
```

UNIX:

```
prompt>/bin/ksh
ksh prompt>chmod +w /workdirectory/*.*
```

On the UNIX operating system platform, you also need to change the permission of `runme.ksh` to give execute permission to the file, as follows:

```
ksh prompt>chmod +x runme.ksh
```

Executing the runme Command

The `runme` command automates the following steps:

1. Setting the system environment variables
2. Loading the `UBBCONFIG` file

3. Compiling the code for the EJB server object
4. Compiling the code for the CORBA/C++ joint client/server application
5. Compiling the code for the CORBA/Java server application
6. Starting the server application using the `tmboot` command
7. Starting the client application
8. Stopping the server application using the `tmshutdown` command

To build and run the CORBA/Java Simpapp sample application, enter the `runme` command, as follows:

Windows NT:

```
prompt>cd workdirectory

prompt>runme
```

UNIX:

```
ksh prompt>cd workdirectory

ksh prompt>./runme.ksh
```

The CORBA/C++-to-EJB Simpapp sample application runs and prints the following messages:

```
Testing simpapp
    cleaned up
    prepared
    built
    loaded ubb
    booted
    ran
    shutdown
    saved results
  PASSED
```

All of the sample application output is placed in the `results` directory. You can check in that directory for the following files:

- The `.log` file, for any compile, server boot, or server shutdown errors
- The `ULOG` file for server application errors and exceptions
- The `output` file for EJB client application output and exceptions

Running the Sample Application

After you have executed the `runme` command, you can run the CORBA/C++-to-EJB Simpapp sample application manually if you like.

To run the CORBA/C++-to-EJB Simpapp sample application:

1. Verify that your environment variables are correct by entering the following command:

   Windows NT:

   ```
   prompt>results\setenv
   ```

   UNIX:

   ```
   prompt>. results/setenv.ksh
   ```

2. Run the sample:

   Windows NT:

   ```
   prompt>tmboot -y
   prompt>java -DTOBJADDR=%TOBJADDR% SimpleClient
   ```

   UNIX:

   ```
   prompt>tmboot -y
   prompt>java -DTOBJADDR=$TOBJADDR SimpleClient
   ```

3. To run the CORBA/C++ joint client/server application, enter a string. After you enter the string, the application returns the string in uppercase and lowercase characters, respectively:

   ```
   String?
   Hello World
   HELLO WORLD
   hello world
   ```

All of the sample application output is placed in the `results` directory. You can check in that directory for the following files:

- The `.log` file, for any compile, server boot, or server shutdown errors
- The `ULOG` file for server application errors and exceptions
- The `output` file for EJB client application output and exceptions

Processes and Files Generated by the CORBA/C++-to-EJB Simpapp Sample Application

This section lists and describes the processes started and the files generated by the CORBA/C++-to-EJB Simpapp sample application.

Processes Started

When the `tmboot` command is executed to start the CORBA/C++-to-EJB Simpapp sample application, the following server processes are started:

Process	Description
TMSYSEVT	The BEA Tuxedo system Event Broker.
TMFFNAME	Starts the following TMFFNAME processes: ■ The TMFFNAME server process with the `-N` option and the `-M` option is the MASTER `NameManager` service. The `-N` option says to start the NameManager Service; the `-M` option says to start this name manager as a Master. This service maintains a mapping of application-supplied names to object references. ■ The TMFFNAME server process with the `-N` option only is a SLAVE `NameManager` service. ■ The TMFFNAME server with the `-F` option contains the `FactoryFinder` object.
JavaServer	The simpapp server process that implements ejb-jar file for the `SimpBean` and `SimpHome` interfaces. The JavaServer has one argument, `SimpleEjb.jar`, which is the EJB Java Archive (JAR) file that was created for the application.
JavaServer	The simpapp server process that implements the `SimpleFactory` interface and the `Simple` interface. The JavaServer has one argument, `SimpleCorba.jar`, which is the CORBA Java Archive (JAR) file that was created for the application.
ISL	The IIOP Listener/Handler.

Files Generated in the cpp Directory

The following table lists and describes the files generated in the `cpp` directory.

File	Description
`Simple_c.cpp`	Client stubs for the `Simple` and `SimpleFactory` interfaces.
`Simple_c.h`	Client stub header for the `Simple` and `SimpleFactory` interfaces.
`Simple_client.exe`	C++ client executable.
`Simple.java`	Generated by the `m3idltojava` command for the `Simple` interface. This interface contains the Java version of the IDL interface. It extends the base class `org.omg.CORBA.Object`.
`SimpleHelper.java`	Generated by the `m3idltojava` command for the `Simple` interface. This class provides auxiliary functionality, notably the `narrow` method.
`SimpleHolder.java`	Generated by the `m3idltojava` command for the `Simple` interface. This class holds a public instance member of type `Simple`. It provides operations for `out` and `inout` arguments, which CORBA has, but which do not map easily to Java's semantics.
`_SimpleImplBase.java`	Generated by the `m3idltojava` command for the `Simple` interface. This abstract class is the server skeleton. It implements the `Simple.java` interface. The server class `SimpleImpl` extends `_SimpleImplBase`.
`_SimpleStub.java`	Generated by the `m3idltojava` command for the `Simple` interface. This class is the client stub. It implements the `Simple.java` interface.

File	Description
SimpleFactory.java SimpleFactoryHelper.java SimpleFactoryHolder.java _SimpleFactoryImplBase.java _SimpleFactoryStub.java	Generated by the m3idltojava command for the SimpleFactory interface.
Simple.ser	The server descriptor file that is generated by the buildjavaserver command.
Simple.jar	The Java archive file that is generated by the buildjavaserver command.

File Generated in the cpp_ejb Directory

The following files are generated in the cpp_ejb directory:

results directory	Generated by the runme command.
.adm/.keydb	Generated by the tmloadcf command. Contains the security encryption key database.

Files Generated in the results Directory

The following table lists and describes the files that are generated in the results directory, which is a subdirectory of the corbaj working directory.

File	Description
input	Generated by the runme command. Contains the input that runme gives to the SimpleClient Java application.
output	Generated by the runme command. Contains the output that is produced when runme executes the SimpleClient Java application.

File	Description
`expected_output`	Generated by the `runme` command. Contains the output that is expected when the `SimpleClient` Java application is executed by the `runme` command. The data in the `output` file is compared with the data in the `expected_output` file to determine whether the test passed or failed.
`log`	Generated by the `runme` command. Contains the output generated by the `runme` command. If the `runme` command fails, check this file, and the `ULOG` file, for errors.
`setenv.cmd`	Generated by the Windows NT `runme.cmd` command. Contains the commands to set the environment variables needed to build and execute the CORBA/C++-to-EJB Simpapp sample application.
`setenv.ksh`	Generated by the UNIX `runme.ksh` command. Contains the commands to set the environment variables needed to build and execute the `Simpapp` sample application.
`stderr`	Generated by the `tmboot` command, which is executed by the `runme` command. If the `-noredirect` server option is specified in the `UBBCONFIG` file, the `System.err.println` method sends the output to `stderr` instead of to the `ULOG` user log file.
`stdout`	Generated by the `tmboot` command, which is executed by the `runme` command. If the `-noredirect` server option is specified in the `UBBCONFIG` file, the `System.out.println` method sends the output to the `stdout` file instead of to the `ULOG` user log file.
`tmsysevt.dat`	Generated by the `tmboot` command, which is executed by the `runme` command. It contains filtering and notification rules used by the TMSYSEVT (system event reporting) process.
`tuxconfig`	Generated by the `tmloadcf` command, which is executed by the `runme` command.
`ubb`	The `UBBCONFIG` file for the CORBA/C++-to-EJB Simpapp sample application.
`ULOG.<`*`date`*`>`	A log file that contains messages generated by the `tmboot` command.

Stopping the CORBA/C++-to-EJB Simpapp Sample Application

Before using another sample application, use the following procedure to stop the CORBA/C++-to-EJB Simpapp sample application and to remove unnecessary files from the work directory:

1. Stop the application:

   Windows NT:

   ```
   prompt>tmshutdown -y
   ```

   UNIX:

   ```
   ksh prompt>tmshutdown -y
   ```

2. Restore the working directory to its original state:

   Windows NT:

   ```
   prompt>nmake -f makefile.nt clean
   ```

   UNIX:

   ```
   prompt>. ./results/setenv.ksh
   prompt>make -f makefile.nt clean
   ```

3. If Symantec's Visual Café is installed on your system, you can use the `smakefile.nt` file rather than the `makefile.nt` file, which is intended for use with the Visual C++ `nmake` program. For example, execute the following commands:

   ```
   prompt>results\setenv
   prompt>set JDKDIR=%JAVA_HOME%
   prompt>smake -f smakefile.nt
   ```

Index

U

V