



# **Installing MCA Services on WebSphere 5.1**

Version 2005

July 2005

Siebel Systems, Inc., 2207 Bridgepointe Parkway, San Mateo, CA 94404

Copyright © 2005 Siebel Systems, Inc.

All rights reserved.

Printed in the United States of America

No part of this publication may be stored in a retrieval system, transmitted, or reproduced in any way, including but not limited to photocopy, photographic, magnetic, or other record, without the prior agreement and written permission of Siebel Systems, Inc.

Siebel, the Siebel logo, TrickleSync, Universal Agent, and other Siebel names referenced herein are trademarks of Siebel Systems, Inc., and may be registered in certain jurisdictions.

Other product names, designations, logos, and symbols may be trademarks or registered trademarks of their respective owners.

**PRODUCT MODULES AND OPTIONS.** This guide contains descriptions of modules that are optional and for which you may not have purchased a license. Siebel's Sample Database also includes data related to these optional modules. As a result, your software implementation may differ from descriptions in this guide. To find out more about the modules your organization has purchased, see your corporate purchasing agent or your Siebel sales representative.

**U.S. GOVERNMENT RESTRICTED RIGHTS.** Programs, Ancillary Programs and Documentation, delivered subject to the Department of Defense Federal Acquisition Regulation Supplement, are "commercial computer software" as set forth in DFARS 227.7202, Commercial Computer Software and Commercial Computer Software Documentation, and as such, any use, duplication and disclosure of the Programs, Ancillary Programs and Documentation shall be subject to the restrictions contained in the applicable Siebel license agreement. All other use, duplication and disclosure of the Programs, Ancillary Programs and Documentation by the U.S. Government shall be subject to the applicable Siebel license agreement and the restrictions contained in subsection (c) of FAR 52.227-19, Commercial Computer Software - Restricted Rights (June 1987), or FAR 52.227-14, Rights in Data—General, including Alternate III (June 1987), as applicable. Contractor/licensor is Siebel Systems, Inc., 2207 Bridgepointe Parkway, San Mateo, CA 94404.

#### **Proprietary Information**

Siebel Systems, Inc. considers information included in this documentation and in Siebel Business Applications Online Help to be Confidential Information. Your access to and use of this Confidential Information are subject to the terms and conditions of: (1) the applicable Siebel Systems software license agreement, which has been executed and with which you agree to comply; and (2) the proprietary and restricted rights notices included in this documentation.

# Contents

## 1 What's New in This Release

## 2 Deployment Platform and Prerequisites

MCA Services Deployment Platform 7

MCA Services Installation Prerequisites 7

## 3 Deploying and Running on WebSphere 5.1.1

The Process of Deploying MCA Services on WebSphere 5.1.1 9

Extracting the MCA Services Files 10

Starting the WebSphere Application Server 10

Creating and Populating the MCA Services Tables on DB2 11

Prerequisites for Creating the MCA Services Tables on DB2 11

Creating and Populating the MCA Services Tables on DB2 11

Creating a Connection to the DB2 Database on the WebSphere Server 12

Creating a Connection to the DB2 Database on Windows 12

Creating a Connection to the DB2 Database on UNIX 12

Creating and Populating the MCA Services Tables on Oracle 12

Prerequisites for Creating the MCA Services Tables on Oracle 13

Configuring the Oracle tnsnames.ora File 13

Creating and Populating the MCA Services Tables on Oracle 13

Configuring the WebSphere Application Server 14

Starting the WebSphere Administrative Console 14

Configuring WebSphere's Database Access for DB2 14

Setting WebSphere DB2 Local Variables 15

Creating the WebSphere Data Source 16

Configuring WebSphere's Database Access for Oracle 16

Changing the Database and Schema Settings	18
Configuring WebSphere JMS Settings	18
Creating a WebSphere Topic Connection Factory	18
Creating a Websphere Topic Destination	19
Configuring the Listener	19
Configuring the WebSphere Pass by Reference Setting	20
Editing the MCA Services Properties Files	20
Configuring the BankframeResource.properties File	20
Configuring theTestCustomerData.properties File	21
Deploying MCA Services on WebSphere	21
Deploying MCA Services on a WebSphere Clustered Environment	21
Prerequisites for Deploying MCA Services on a WebSphere Clustered Environment	21
Starting the WebSphere Deployment Manager	22
Configuring the Clustered Database and JMS Cluster Settings	22
Configuring the BankframeResource.properties Cluster Settings	22
Configuring the Application Deployment Cluster Settings	22
Running the MCA Services Enterprise Application	23

# 1

## What's New in This Release

### What's New in Installing MCA Services on WebSphere 5.1, Version 2005

Table 1 lists changes in this version of the documentation to support release 2005 of the software.

Table 1. What's New in Installing MCA Services on WebSphere 5.1, Version 2005

Topic	Description
<a href="#">Creating and Populating the MCA Services Tables on DB2, page 11</a>	Removed references to the sample scripts storeandforward.sql and eabpersistertxnmap.sql as these files are no longer provided with the MCA Services Enterprise Application.
<a href="#">Configuring the Oracle tnsnames.ora File, page 13</a>	Replaced the SID variable ORCL with database_instance_name.
<a href="#">Configuring the WebSphere Oracle Driver Path Resource, page 16</a>	Replaced the JDBC provider cl assname Oracl e. j dbc. xa. cl i ent. oracl e. xa. DataSource with oracl e. j dbc. pool . Oracl eConnecti onPool DataSource.
<a href="#">Creating a WebSphere Topic Connection Factory, page 18</a>	Added the Port setting to the Topic Connection Factory configuration.
<a href="#">Configuring the WebSphere Pass by Reference Setting, page 20</a>	Added instructions for configuring the WebSphere Pass by Reference setting.
<a href="#">Deploying MCA Services on a WebSphere Clustered Environment, page 21</a>	Added instructions for deploying the MCA Services Enterprise Application on a WebSphere clustered environment.



# 2

## Deployment Platform and Prerequisites

This chapter covers the MCA Services Enterprise Application deployment platform and installation prerequisites. It includes the following topics:

- MCA Services Deployment Platform
- MCA Services Installation Prerequisites

### MCA Services Deployment Platform

The steps described in this document to deploy MCA Services (Multi Channel Architecture Services) support a Windows and UNIX environment. In this documentation the terms MCA Services and Foundation Services are interchangeable. MCA Services encompasses the Financial Process Integrator engine and the Statemachine.

**NOTE:** For all supported platform version information, including the supported database, application server and third-party software versions, refer to the Siebel Foundation Services System Requirements and Supported Platforms document (SRSP). The SRSP document is available on Siebel SupportWeb (<http://supportweb.siebel.com>).

### MCA Services Installation Prerequisites

- IBM WebSphere 5.1.1 must be correctly installed and configured.
- The target server machine is not running any other WebSphere applications, including any previous version of MCA Services.
- A supported database must be installed and configured.
- The Java utilities `java`, `javac`, and `jar` must be available at the command line.





# 3

## Deploying and Running on WebSphere 5.1.1

This chapter covers deploying the MCA Services Enterprise Application on the WebSphere application server. It includes the following topics:

- [The Process of Deploying MCA Services on WebSphere 5.1.1](#)
- [Extracting the MCA Services Files](#)
- [Starting the WebSphere Application Server](#)
- [Creating and Populating the MCA Services Tables on DB2](#)
- [Creating a Connection to the DB2 Database on the WebSphere Server](#)
- [Creating and Populating the MCA Services Tables on Oracle](#)
- [Configuring the WebSphere Application Server](#)
- [Changing the Database and Schema Settings](#)
- [Configuring WebSphere JMS Settings](#)
- [Configuring the WebSphere Pass by Reference Setting](#)
- [Editing the MCA Services Properties Files](#)
- [Deploying MCA Services on WebSphere](#)
- [Deploying MCA Services on a WebSphere Clustered Environment](#)
- [Running the MCA Services Enterprise Application](#)

### The Process of Deploying MCA Services on WebSphere 5.1.1

The following sections detail the procedures needed to deploy MCA Services on a WebSphere 5.1.1 non-clustered environment. If you are deploying on a WebSphere clustered environment, read the section [Deploying MCA Services on a WebSphere Clustered Environment](#) first.

The process of deploying MCA Services on a WebSphere 5.1.1 non-clustered environment is comprised of the following procedures to be performed in the order listed:

- [Extracting the MCA Services Files](#)
- [Starting the WebSphere Application Server](#)
- [Creating and Populating the MCA Services Tables on DB2](#)
- [Creating a Connection to the DB2 Database on the WebSphere Server](#)
- [Creating and Populating the MCA Services Tables on Oracle](#)

- [Configuring the WebSphere Application Server](#)
- [Changing the Database and Schema Settings](#)
- [Configuring WebSphere JMS Settings](#)
- [Configuring the WebSphere Pass by Reference Setting](#)
- [Editing the MCA Services Properties Files](#)
- [Deploying MCA Services on WebSphere](#)
- [Running the MCA Services Enterprise Application](#)

## Extracting the MCA Services Files

The MCA Services installation files for WebSphere 5.1.1 are available on the installation CD.

The installation files need to be extracted from the installation JAR file to the WebSphere root directory before deploying MCA Services.

### *To extract the MCA Services installation files*

- 1 Copy the installation files from the installation CD to a temporary folder.
  - The WebSphere 5.1.1 DB2 installation file is available on the Installation CD at:  
packs\FoundationServices<vx.x>WebSphere511forDB2.jar
  - The WebSphere 5.1.1 Oracle installation file is available on the Installation CD at:  
packs\FoundationServices<vx.x>WebSphere511forOracle.jar

- 2 Type the following commands at a command prompt:

```
cd <tmp>
```

```
jar xvf <tmp>\<foundationservices_install.jar>
```

where tmp is the folder you have copied the installation files to and  
foundationservices\_install.jar is the name of the JAR file to be extracted.

## Starting the WebSphere Application Server

This section describes how to start the WebSphere application server.

### *To start WebSphere on Windows*

- 1 Navigate to the Start > Programs > IBM WebSphere > Application Server v5.1.1 > First Steps screen.
- 2 Click on the Start the Server option. When Server server1 open for ebusiness appears in the log on the bottom of the panel, this indicates that the server has started up successfully.

### *To start WebSphere on UNIX*

- 1 Go to the root of the server installation, which should be the folder named WebSphere.
- 2 Enter the bin subdirectory and type the command:  
`./startServer server1 &`

## Creating and Populating the MCA Services Tables on DB2

This section covers creating and populating the MCA Services tables on a DB2 database. If you are using an Oracle database server, ignore this section and skip to the [Creating and Populating the MCA Services Tables on Oracle](#) section.

### Prerequisites for Creating the MCA Services Tables on DB2

The following are the prerequisites for creating and configuring the MCA Services database tables on DB2:

- A DB2 database and DB2 database user with DBA rights for the database have been created. Consult your DB2 documentation for information on how to do this.
- You must have physical access to the console of the machine running DB2.

### Creating and Populating the MCA Services Tables on DB2

This topic covers creating the MCA Services database tables and populating the MCA Services Routes and Financial Process Integrator tables with sample data.

**NOTE:** Running the MCA Services script can produce errors such as:

DB21034E The command was processed as an SQL statement because it was not a valid Command Line Processor command. During SQL processing it returned: SQL0204N  
"BANKFRM.EJBGROUP\_PERMISSIONS" is an undefined name. SQLSTATE=42704

These errors are normal and should be ignored. They are produced because the script always ensures it has an empty table space.

#### *To create and populate the MCA Services tables on DB2*

- 1 Copy the database scripts `bufferpool.sql`, `bankframemca.sql`, `defaultroutes.sql`, and `txnsampledta.sql` from `<installation_directory>\deployment\database\db2` directory to the DB2 server.
- 2 Type the following commands at a command prompt to create the buffer pool:  
`<x: \SQLLIB>\bin\db2cmd`  
`db2 -f <x: \xx>\bufferpool.sql`

where <x: \SQLLI B> is the path to the DB2 bin directory and <x: \xx> is the path to bufferpool . sql on the DB2 server.

**3** Restart the DB2 server to activate the buffer pool.

**4** Type the following commands at a command prompt to create the database tables:

```
<x: \SQLLI B>\bin\db2cmd
```

```
db2 -f <x: \xx>\bankframemca. sql
```

where <x: \SQLLI B> is the path to the DB2 bin directory and <x: \xx> is the path to bankframemca. sql on the DB2 server.

**5** Type the following commands at a command prompt to populate the MCA Services Routes and Financial Process Integrator tables with sample data:

```
db2 -f <x: \xx>\default routes. sql
```

```
db2 -f <x: \xx>\txnsampl edata. sql
```

where <x: \SQLLI B> is the path to the DB2 bin directory and <x: \xx> is the path to default routes. sql and txnsampl edata. sql on the DB2 server.

## Creating a Connection to the DB2 Database on the WebSphere Server

If the DB2 server is not running on the same machine as the WebSphere server, a connection to the DB2 database must be configured on the WebSphere Server. This documentation assumes the connection is named bankfrm, adjust to your database configuration.

### Creating a Connection to the DB2 Database on Windows

Use the DB2 Client Configuration Assistant to create a connection to the DB2 database. Consult your DB2 documentation for information on how to do this.

### Creating a Connection to the DB2 Database on UNIX

Use the DB2 command-line interpreter and the DB2 catalog database command to create a connection to the DB2 database. Consult your DB2 documentation for information on how to do this.

## Creating and Populating the MCA Services Tables on Oracle

This section covers creating and populating the MCA Services tables on an Oracle database. If you are using a DB2 database server ignore this section and refer to the [Creating and Populating the MCA Services Tables on DB2](#) section.

## Prerequisites for Creating the MCA Services Tables on Oracle

The following are the prerequisites for creating the MCA Services database tables on Oracle:

- The Oracle command line utilities must be available at the command line.
- An Oracle database and Oracle database user with DBA rights for the database has been created. Consult your Oracle documentation for information on how to do this.

## Configuring the Oracle tnsnames.ora File

The database information needs to be added to the Oracle tnsnames.ora file, which is used to read database connection configurations.

### To configure the Oracle tnsnames.ora file

- 1 Copy the database scripts bankframemca.sql, defaultroutes.sql, and txnsampledta.sql from <installation\_directory>\deploy\database\Oracle directory to the Oracle server.
- 2 Open the Oracle tnsnames.ora file located in the Oracle installation directory.
- 3 Add the following entry to the end of the file:

```
<database_name> =  
  (DESCRIPTION =  
    (ADDRESS = (PROTOCOL = TCP)(Host = <hostname>)(Port = 1521))  
    (CONNECT_DATA = (SID = <database_instance_name>))  
  )
```

where <database\_name> is the name of the MCA Services database, <hostname> is the name of the Oracle database server and <database\_instance\_name> is the name of the Oracle MCA Services database instance.

## Creating and Populating the MCA Services Tables on Oracle

This section covers creating and populating the MCA Services database tables on Oracle.

**NOTE:** Running the MCA Services script can produce errors such as:

*delete from BANKFRM.EJBGROUP\_MEMBERS*

*\**

*ERROR at line 1:*

*ORA-00942: table or view does not exist*

These errors are normal and should be ignored. They are produced because the script always ensures it has an empty table space.

*To create and populate the MCA Services tables on Oracle*

- 1 Start SQL Plus with the following command:  
`sql pl us <database_user>/<password>@<database_name>`
- 2 Run the following script to create the MCA Services database tables:  
`@' <x: \xx>\bankframemca. sql '`  
Where <x:\xx> is the path to bankframemca.sql on the Oracle server.
- 3 Run the following scripts to populate the MCA Services Routes and Financial Process Integrator tables with sample data:  
`@' <x: \xx>\default routes. sql '`  
`@' <x: \xx>\txnsampl edata. sql '`  
Where <x:\xx> is the path to default routes. sql and txnsampl edata. sql on the Oracle server.

## Configuring the WebSphere Application Server

### Starting the WebSphere Administrative Console

The WebSphere administrative console is the mechanism by which WebSphere defines and configures its properties.

*To start the WebSphere administrative console*

- 1 Start the WebSphere application server.
- 2 When the WebSphere application server is running, open a web browser and point it to `http: //<hostname>: 9090/admi n.`  
where <hostname> is the URL/IP address of the machine that WebSphere is running on. A Login screen displays with a User ID field.
- 3 Enter a User ID in the User ID field. The User ID field is not part of any authentication mechanism and is only used to track user changes, therefore you can use any name.

### Configuring WebSphere's Database Access for DB2

The domain configuration must be modified to provide WebSphere with the user credentials associated with the DB2 database. This is done to allow WebSphere access to the MCA Services DB2 database.

### *To configure the database access and specify the DB2 driver classes*

- 1** Start the WebSphere administrative console and log into the console.
- 2** Navigate to the Resources > JDBC Providers screen from the left hand pane.
- 3** Specify the database driver classes.  
WebSphere, by default, might already have an entry here for a driver that you can edit as appropriate.
  - a** If there is not a default entry, click the New button to create a driver entry.  
Name the new driver DB2 Universal JDBC Provider (XA), and enter a description if required.
  - b** If a driver already exists, click on the driver name.  
You can edit the driver name if required.
- 4** Set the DB2\_JDBC\_DRIVER\_PATH variable to the classpath of the driver classes.
- 5** Type COM.ibm.db2.jdbc.DB2XADataSource for the implementation classname.
- 6** Click Apply.  
A message box is displayed at the top of the page indicating that changes have been made that need to be saved.
- 7** Click on Save in the message box.  
The Save to Master Configuration screen is then displayed.
- 8** Click the Save button again.  
On completion, the Home Page is displayed.

It is good practice to save any unsaved changes as you proceed. Changes needing to be saved are indicated by the appearance of the message box with the hyper-linked Save being added to the top of the pages being viewed.

## Setting WebSphere DB2 Local Variables

When the database driver has been declared, you must set the path to the driver classes by changing the DB2\_JDBC\_DRIVER\_PATH variable.

### *To set the WebSphere local variables*

- 1** Navigate to Environment > Manage WebSphere Variables from the left hand pane of the console and a listing of all the WebSphere local variables is displayed.
- 2** Select the variable named DB2\_JDBC\_DRIVER\_PATH to configure the variable.  
The configuration screen is then displayed.
- 3** Configure the Value field to display the absolute path to the zip file containing the driver classes.  
This zip file is usually called db2java.zip, for example, if the path to the db2java.zip file is d:\SQLLIB\java\db2java.zip, set the variable DB2\_JDBC\_DRIVER\_PATH to value d:\SQLLIB\java.

## Creating the WebSphere Data Source

When the database driver has been declared and a path associated with it, you must set up a data source.

### *To create the WebSphere Data Source*

- 1 Select Resource > JDBC Providers from the left menu. The page displayed should have a list of possible drivers.
- 2 Select the driver named DB2 Universal JDBC Provider. At the bottom of the resultant screen, click on Data Sources (Version 4) and a new screen is displayed.
- 3 Click the New button to create a new data source. The configuration screen is then displayed. Configure the Name, JNDI Name, Database Name, Default User ID and Default Password fields.
- 4 Save the changes.

## Configuring WebSphere's Database Access for Oracle

You must modify the domain configuration to provide WebSphere with the user credentials associated with the Oracle database. This allows WebSphere access to the MCA Services Oracle database.

### Configuring the WebSphere Oracle Driver Path Resource

The WebSphere JDBC Providers screen is used to specify the database driver classes.

### *To configure the Oracle Driver Class Resource*

- 1 Log into the WebSphere console.
- 2 Navigate to the Resources > JDBC Providers screen.
- 3 Click the New button.  
The Configuration panel displays.
- 4 Select Oracle JDBC Driver (XA) from the drop-down list.
- 5 Click Apply.  
The General Properties panel displays.
- 6 Configure the following fields:

Value	Description
Driver Name	Set to Oracle JDBC Driver (XA) for consistency with the rest of this document.
Description	Enter a description of the Oracle class driver. This field is optional.
ORACLE_JDBC_DRIVER_PATH	Set this to the classpath of the Oracle driver classes.
Implementation Class Name	Set this to <code>oracle.jdbc.pool.OracleConnectionPoolDataSource</code> .



Value	Description
	oracle.jdbc.pool.OracleConnectionPoolDataSource

- 7 Click Apply and save the changes.

## Configuring the WebSphere Oracle Driver Path Environment Variable

When the database driver has been declared, you must set the path to the driver classes by changing the ORACLE\_JDBC\_DRIVER\_PATH variable.

### To configure the WebSphere Oracle Driver Path Environment Variable

- 1 Navigate to the Environment > Manage WebSphere Variables screen.
- 2 Click on the ORACLE\_JDBC\_DRIVER\_PATH variable.
- 3 The Configuration panel displays.
- 4 Set the Value variable to the absolute path of the Oracle driver classes.
- 5 The Oracle driver classes zip file is usually called classes12.zip. If the path to the classes12.zip file is d:\oracle\ora90\jdbc\lib\classes12.zip, set the ORACLE\_JDBC\_DRIVER\_PATH Value variable to d:\oracle\ora90\jdbc\lib.

## Creating a WebSphere Oracle Data Source

Now that the database driver has been declared and a path associated with it, you must set up a data source.

### To create a WebSphere Oracle data source

- 1 Navigate to the Resource > JDBC Providers screen from the left hand pane.  
A list of possible drivers is displayed.
- 2 Click on the Oracle JDBC Driver (XA) driver.
- 3 Click on Data Sources (Version 4) on the bottom of the next screen.  
The Data Sources (Version 4) screen displays.
- 4 Click the New button to create a new data source.  
The General Properties screen displays.
- 5 Configure the following fields:

Value	Description
Name	The required display name.
JNDI Name	The JNDI name for the resource.
Database Name	The database used by the WebSphere data source instance to get a connection.
Default User ID	The User ID for connecting to the database.

Value	Description
Default Password	The password for connecting to the database.

- 6 Click Apply to save the information.  
The Additional Properties panel displays.
- 7 Click on Custom Properties.  
The Custom Properties screen displays.
- 8 Click on URL.  
The URL Configuration screen displays.
- 9 Set the URL Value variable to the JDBC URL. The JDBC URL should be similar to  
jdbc:oracle:thin:@databaseservername:1521:bankfrm.
- 10 Click on Apply.
- 11 Click Save to save the changes.

## Changing the Database and Schema Settings

For deployable EAR files in WebSphere Application Server 5.1.1, you must change the database name and schema to which the EJBs are mapped.

- 1 Import the EAR file into WSAD.
- 2 Open the J2EE Navigator perspective and navigate to the folder WebSphere-MCAEJBs/ejbModule/META-INF/Schema.
- 3 To configure the Database name field, double click on the .dbxmi file and modify.
- 4 To change the schema name, double click on the .schxmi file and modify the field.  
Specifying the schema name as NULLID allows the EAR file to be deployed on any schema on the specified database.
- 5 Save the modifications and re-export the EAR file for re-deployment on the application server.

## Configuring WebSphere JMS Settings

The following sections describe how to configure Java Message Service (JMS) settings.

### Creating a WebSphere Topic Connection Factory

This procedure covers creating a new WebSphere Topic Connection factory.

### *To create a Topic Connection factory*

- 1 Navigate to Resource > WebSphere JMS Provider > Select the WebSphere Topic Connection Factories.
- 2 Click New to add a new Topic Connection Factory.
- 3 In the General Properties screen, complete the following fields:

Field	Value
Name	exampl eTopi cConnecti onFactory
JNDI Name	eontec/j ms/Topi cConnecti onFactory
Port	queued

- 4 Click the Enable XA tick-box.
- 5 Save the configurations.

## Creating a Websphere Topic Destination

This topic covers creating a WebSphere Topic Destination.

### *To create a WebSphere Topic Destination*

- 1 Navigate to the Resource > WebSphere JMS Provider screen.
- 2 Select WebSphere Topic Destinations.
- 3 Click on New to add a new Topic Destination.  
The General properties screen displays.
- 4 Complete the fields as follows:

Property	Value
Name	exampl eTopi c
JNDI Name	eontec/j ms/exampl eTopi c
Topic	eontec/j ms/exampl eTopi c

- 5 Save the changes.

## Configuring the Listener

### *To configure the listener:*

- 1 Navigate to the Servers > Application Servers > server1 > Message Listener Service > Listener Ports > New screen.

- 2 On the Configuration tab, complete the fields as follows:

Property	Value
Name	eontecListener
Initial State	started
Connection Factory JNDI Name	eontec/jms/TopicConnectionFactory
Destination JNDI Name	eontec/jms/exampleTopic

- 3 Save the changes.

## Configuring the WebSphere Pass by Reference Setting

The WebSphere Pass by Reference value needs to be configured to prevent `ClassCastException` being thrown when the MCA Services `convertEnumToVector` method is called.

### *Configuring the WebSphere Pass by Reference value*

- 1 Navigate to the Servers > Application Servers screen.
- 2 Select server1.
- 3 Select ORB Service from the list of Options on the next screen.
- 4 Click on the check box Pass by Reference to set it to true.

## Editing the MCA Services Properties Files

Before MCA Services is uploaded onto the server, you must edit the files `BankframeResource.properties` and `TestCustomerData.properties` in the `si ebel . ear` file for local settings. The file `si ebel . ear` will have been extracted to `<WebSphere Root>\Foundation\services\deploy\`.

Extract the files `BankframeResource.properties` and `TestCustomerData.properties` from the file `si ebel . ear` to a local directory.

### Configuring the `BankframeResource.properties` File

For configuring the `BankframeResource.properties` file, refer to *MCA Services Configuration and Administration Guide* on the Foundation Services Bookshelf.

## Configuring the `TestCustomerData.properties` File

For configuring `TestCustomerData.properties` refer to *MCA Services Configuration and Administration Guide* on the Foundation Services Bookshelf.

## Deploying MCA Services on WebSphere

- 1 In the WebSphere Web Browser Console, navigate to Applications > Enterprise Applications from the left hand pane.  
A list of all applications already deployed and running is displayed.
- 2 Click Install to display the Preparing for the application installation screen.
- 3 Click Browse to locate the file `si_ebel.ear` on the local machine, then select the file and click Next.  
This action uploads the `si_ebel.ear` file from the local machine to the server, be it on a remote machine or on the local machine itself. The App Deployment Options screens are then displayed.
- 4 Click Next at the bottom of each of the App Deployment Options screens pages until the final confirmation page is displayed.  
The App Deployment Options screens are used to install the EAR file on the server. However, the default values for all these options are pre-filled from uploading the `si_ebel.ear` file, so there is no need to alter any of the options over the nine pages.
- 5 Click Finish.  
The EAR file is displayed. Successful installation of the EAR file results in the display of an Application Installed Successfully screen.
- 6 Click Save.
- 7 The WebSphere home page displays.

## Deploying MCA Services on a WebSphere Clustered Environment

You deploy MCA Services on a clustered environment in the same way as for a non-clustered environment, apart from the steps in this section. Also, for a clustered environment, you use the WebSphere Deployment Manager rather than the WebSphere Administrative Console, for configuring the database and JMS components, and for deploying the application.

## Prerequisites for Deploying MCA Services on a WebSphere Clustered Environment

You must set up and configure the WebSphere clustered environment before deploying MCA Services. Consult your vendor's documentation on how to set up and configure a WebSphere clustered environment.

## Starting the WebSphere Deployment Manager

You use the Deployment Manager to access each node in the cluster. In a clustered environment you configure the database and JMS components, and deploy MCA Services using the Deployment Manager.

### *To start the Deployment Manager*

- 1 Open a Web browser and point it to `http://<servername>:<portnumber>/admin`.  
where *servername* is the URL/IP address of the machine on which WebSphere 5.1.1 has been installed and *portnumber* is the port that the Deployment Manager is listening on.
- 2 Start the WebSphere Application Server.
- 3 The Login screen is displayed.
- 4 Type any user name in the User ID field. The User ID field is not part of any authentication mechanism but is used to track user changes, therefore you can type any name.

## Configuring the Clustered Database and JMS Cluster Settings

You must configure the database and JMS components in the same way as described in the sections: Configuring WebSphere's Database Access for DB2, Configuring WebSphere's Database Access for Oracle and Configuring WebSphere JMS Settings, with the following exceptions:

- You must do the configuration using the Deployment Manager rather than the Administrative Console.
- You must do the configuration on a per-node basis.

## Configuring the BankframeResource.properties Cluster Settings

You must configure the BankframeResource.properties file as described in the *MCA Services Configuration and Administration Guide*, with the following exception:

- Set the channel . `http.client.url =` property to:  
`http://WebServer-Hostname:WebServer-Port-Number/BankFrameMCA/HttpServer`  
where *WebServer-Hostname* and *WebServer-Port-Number* are the hostname and port number of the HTTP Server. In most cases, you can leave the port number field blank. Consult the vendor documentation for further information.

## Configuring the Application Deployment Cluster Settings

You must configure the settings in the same way as described in the section Deploying MCA Services on WebSphere, with the following exceptions:

- You must do the configuration using the Deployment Manager rather than the Administrative Console.

- You must select the cluster for all modules on the Map Modules to Application Settings screen.
- You must select the option Synchronizing changes with Nodes when saving the changes to the repository.

## Running the MCA Services Enterprise Application

When MCA Services is installed, there is a red X to the right of the `si_ebel` application, indicating that the application is installed but not running.

### *To run the MCA Services Enterprise Application*

- 1 Navigate to the Applications > Enterprise Applications screen.  
A list of installed applications displays.
- 2 Select the option box to the left of the `si_ebel` application.
- 3 Click the Start button.
- 4 Save the changes when prompted.
- 5 Navigate to the Applications > Enterprise Applications screen from the left hand menu.  
The list of installed applications displays. A green arrow displays to the right of the `si_ebel` application indicating that the application is running.