

Replicating the MultiLoggerDB Database Database Application Note #1

Overview

Replication is simply the process of replicating or duplicating, the changes made from a source database, to one or more target databases. Once replication has taken place the data at all sites is in synchronization. This is typically done to improve access to the data because it allows various sites in the organization to have their own copies of the data. Each site then works on their own copy, and the changes made by each must “automagically” be reflected at any or all of the other sites.

IBReplicator uses an Asynchronous model for replication, changes are ‘stored up’, and every so often, every few seconds/minutes/hours or days, the Replication Server wakes up and send the changes to the targets. The advantage of this method is that if one or more of the target databases is off-line, it does not matter, since it will catch up next time it is on-line. The disadvantage is that there is a lag time in which the source database is out of sync with it’s various targets, but this normally can be kept within acceptable levels.

This Database Application Note will provide guidelines in the configuration and use of IBReplicator to Replicate the MultiLogger Database on local or remote machines.

Installation

You will need 4 items to run IBReplicator:

- Replication Manager – For configuring the replication process.
- Replication Server – For executing the replication process.
- Replication Manager License – Codes to allow the Replication Manager to function.
- Replication Server License – Codes to allow the Replication Server to function.

The IBReplicator CD contains the installer for the Replication Manager and Replication Server. The invoice you will receive from Canary Systems will detail the Manager and Server license codes required to activate the functionality. The IBReplicator CD contains installers for the Windows platform, other platforms are supported, contact Canary Systems for additional information.

Insert the IBReplicator CD, the installation program should start, as shown below.



Select **IBReplicator Manager** and click **Install**. Follow the on-screen instructions. It is recommended to use a common directory for both products, i.e. \Program Files\IBReplicator.

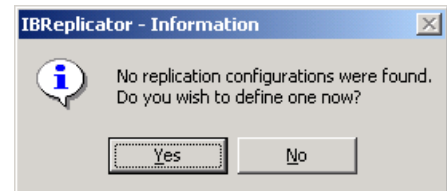
Select **IBReplicator Server** and click **Install**. Follow the on-screen instructions.

You will now have a program group named **IBReplicator** accessible from your **Start | Programs** menu.

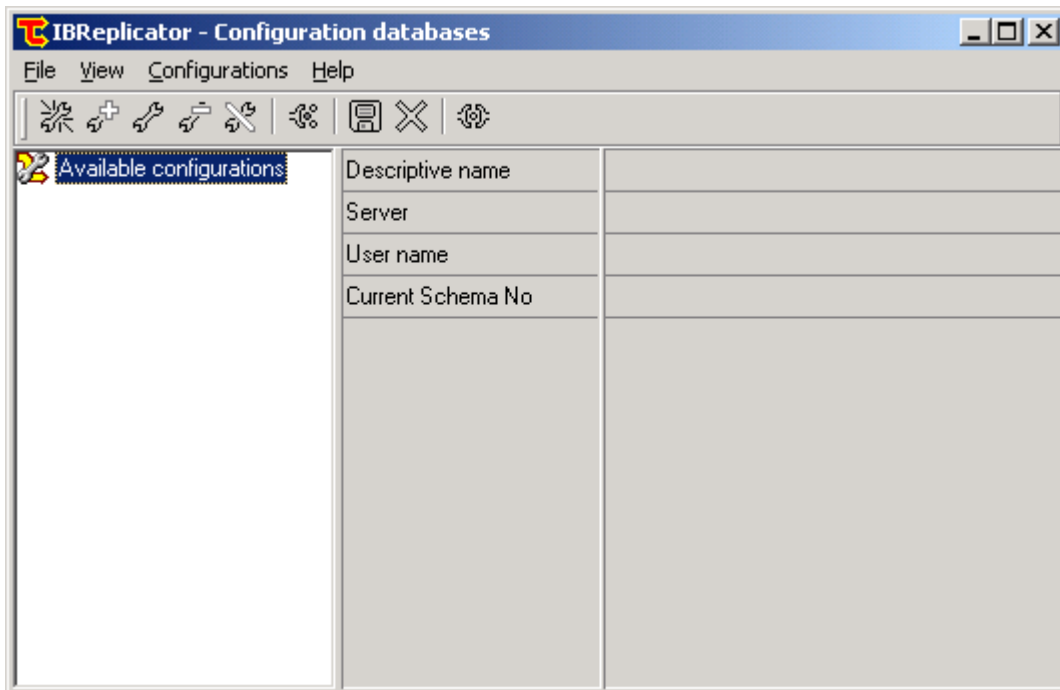
NOTE: There may be important updates to your database that must be performed for IBReplicator to function. Before attempting to install and configure IBReplicator contact Canary Systems.

Configuration

Start the Replication Manager by selecting the **IBRpIManager** shortcut from the **Programs | IBReplicator** group. Since this is a new installation a prompt will display regarding the missing configurations.



Click **Yes** to begin configuration using the Configuration Databases form, shown below.



Select the menu item **Configurations | Create** to begin the configuration process.

Fill in the following fields:

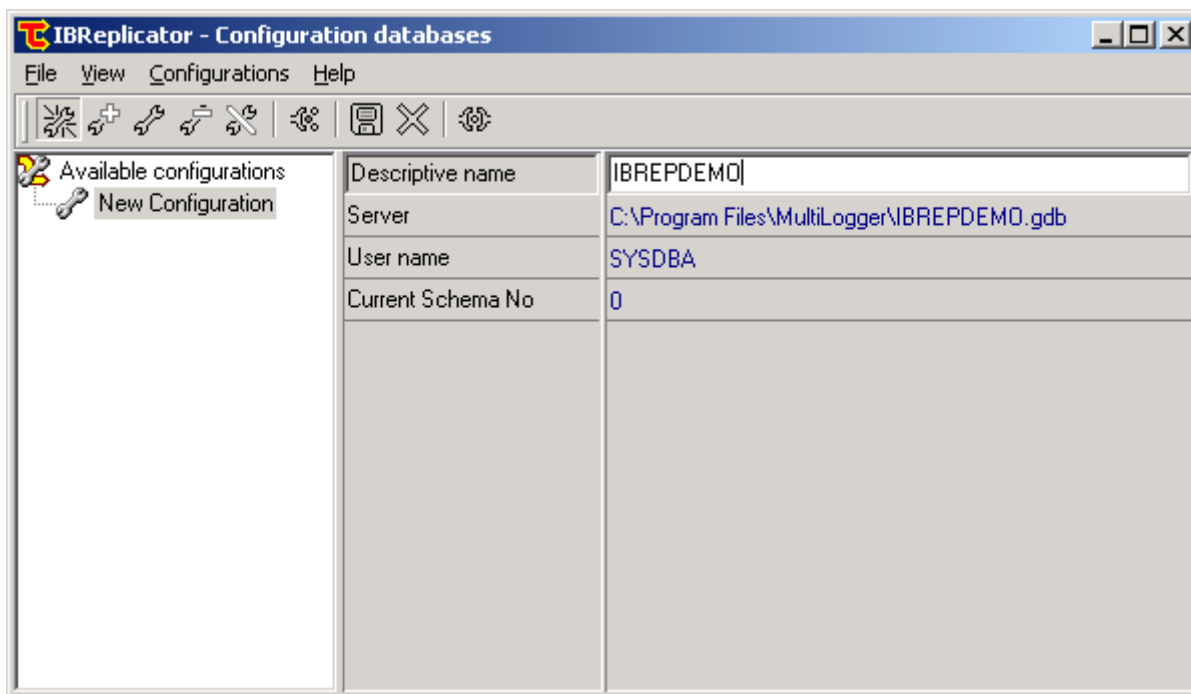
Descriptive name: A more verbose description of the replication.

Server: A path to the configuration file, browse to an existing file or browse to an existing directory and type in the file to create. An Interbase GDB file is used to store the configuration. **DO NOT USE** the MultiLogger GDB file.

User name: The administrator name on the configuration file host machine.

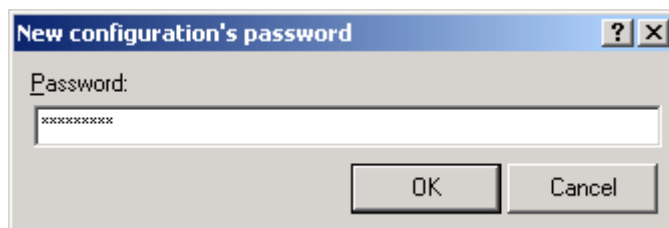
Current Schema No: Generally the default may be used, if numerous replication schemes are to be defined then it is advisable to separate the Schema No by at least 100, this avoids conflicts when triggers are created on each replicated table in each configured replication scheme.

An example configuration is shown below.



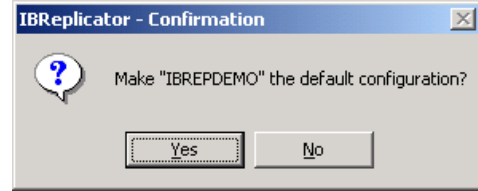
Select **Configurations | Save** or press the **Save** button on the toolbar to save this configuration.

You will be prompted for your password on the host machine to save the configuration.



Press **OK**.

You will then be prompted to set this configuration as the default. Select **Yes**. You will be prompted for your password again.



The Replication Manager form will display, select the **Databases** tab. The source and target database must be configured for the replication process. The source database will be the existing MultiLoggerDB database, a file with the extension .GDB, usually in the \Program Files\MultiLogger directory. When MultiLoggerDB is installed an empty database named multilogger.gdb is installed in your \Program Files\MultiLogger directory, this file is typically copied and renamed to match the project that this database will be used for. You will also need the empty copy of multilogger.gdb for the replication process.

Select the menu item **Database | Add** (or click on the toolbar button), you will notice on the right side of the form fields to configure the database. Configure the fields, then select **Database | Save** (or click on the toolbar button).

Minimum configuration includes:

Description name: A more verbose description of the database.

Server: The path and filename to the Source or Target database.

Administrative user name: The user name for administrative rights on the server.

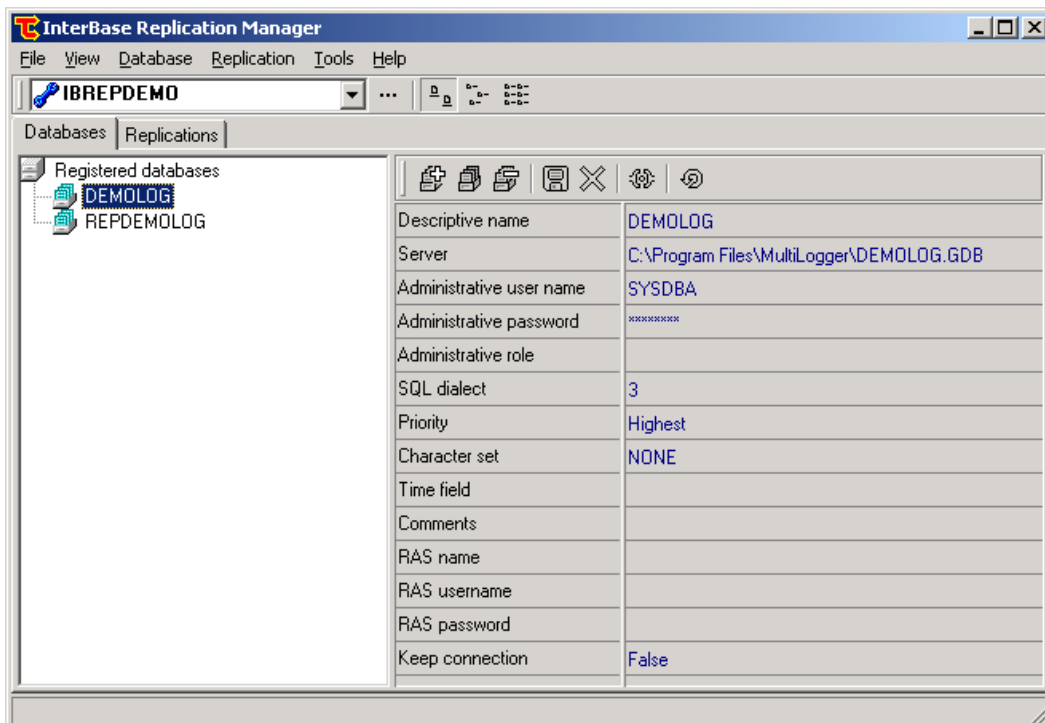
Administrative password: The password for the administrator on the server.

Advanced configuration includes:

RAS name: The name of your Remote Access Server configuration to allow the replication server to dial-up a remote machine and perform updates using RAS (you will need to check your Start | Settings | Network and Dialup Settings configuration for a list of RAS names).

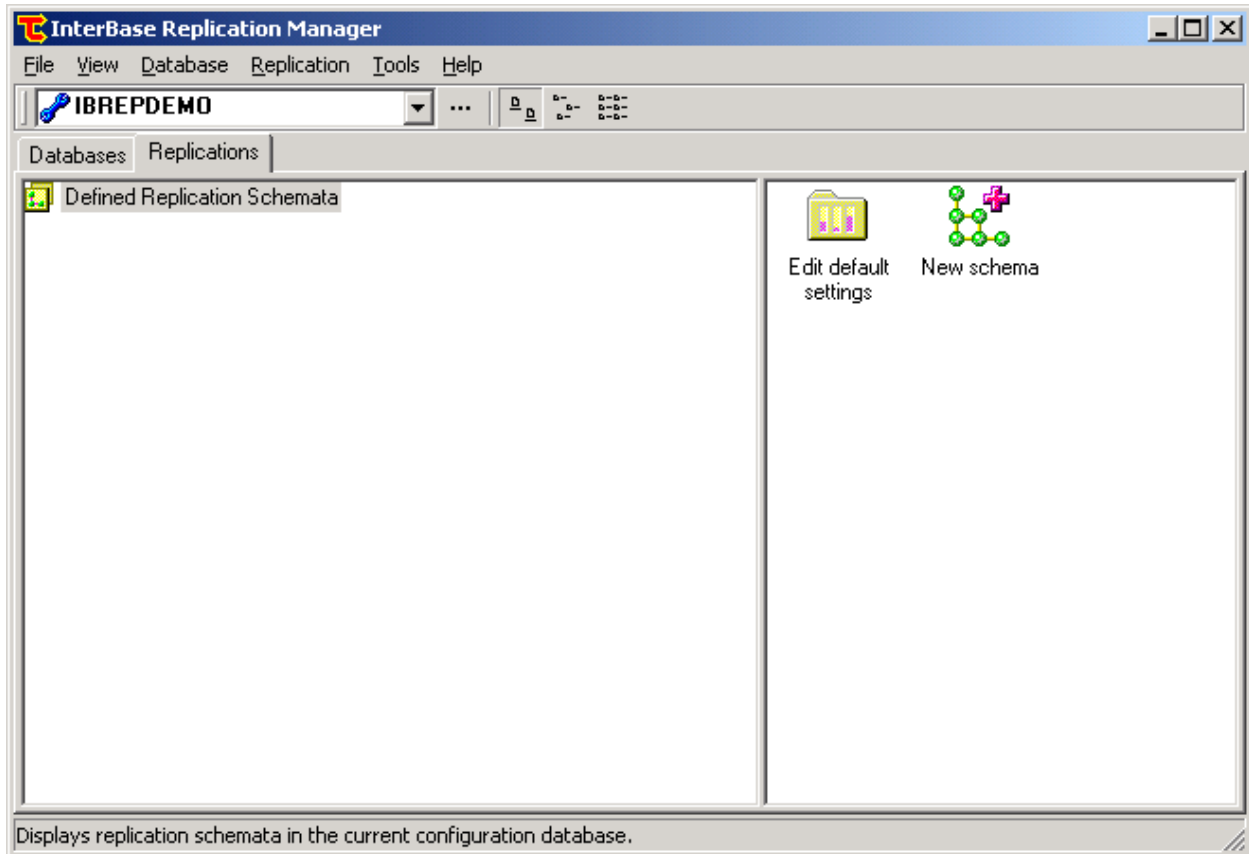
Keep connection: Generally set to false, to disconnect the line after replication is complete.

When the source and target databases are configured you should have a display similar to that shown below. Note: The DEMOLOG name was simply used for this example, the actual database names and configuration will be different for your configuration.



Now the Replication Schema must be defined, or defining what exactly will be replicated from one database to another.

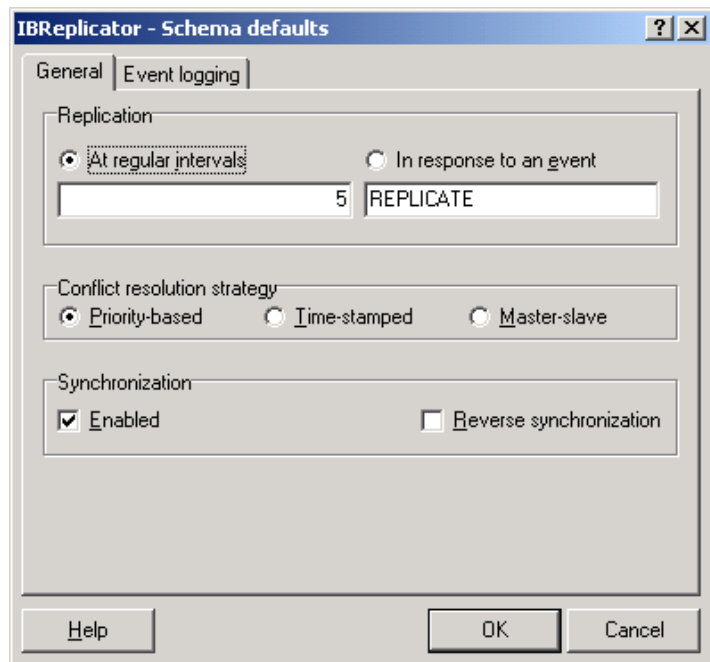
Click on the **Replications** tab to display the Replication Schema configuration, as shown below.



Double-click the **Edit default settings** icon on the right, this displays the Schema defaults form. These settings will be used as the defaults for any new Schema that is created.

Make sure **Priority-based** is selected as the **Conflict resolution strategy** on the General tab.

Make sure **Enabled** is checked in the **Synchronization** group.

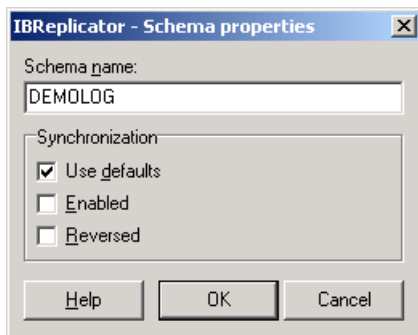
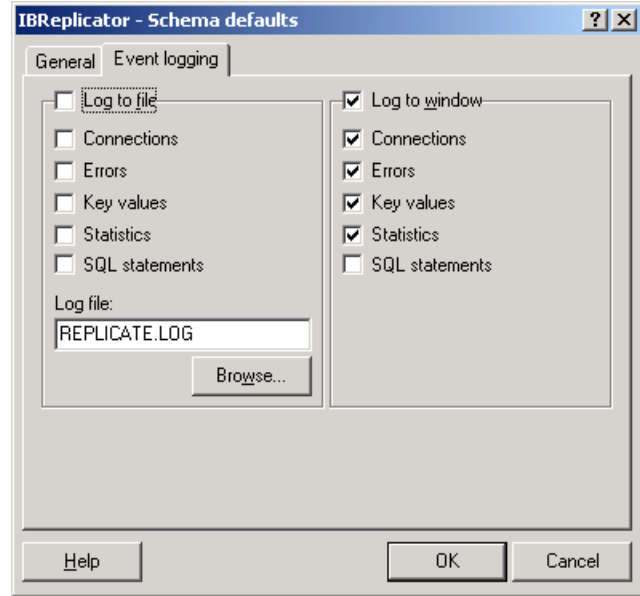


Make sure that **Log to Window** is enabled and the **Connections**, **Errors**, **Key Values**, and **Statistics** items are checked on the **Event logging** tab. You may also want to log these events to a file, but usually the window messages are sufficient.

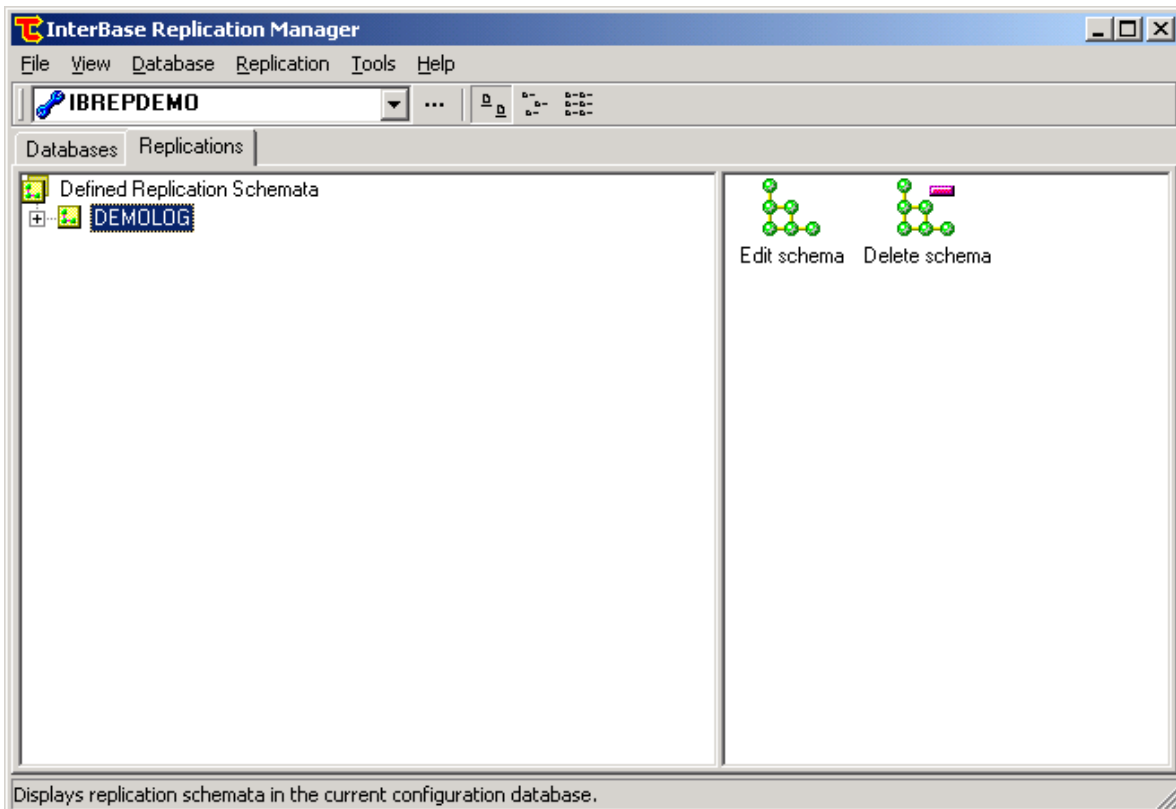
Click **OK** to complete these modifications to the Schema defaults.

Double-click the **New schema** icon, the Schema properties form will display. Enter a schema name, use an appropriate name for your project, leave other settings at their defaults.

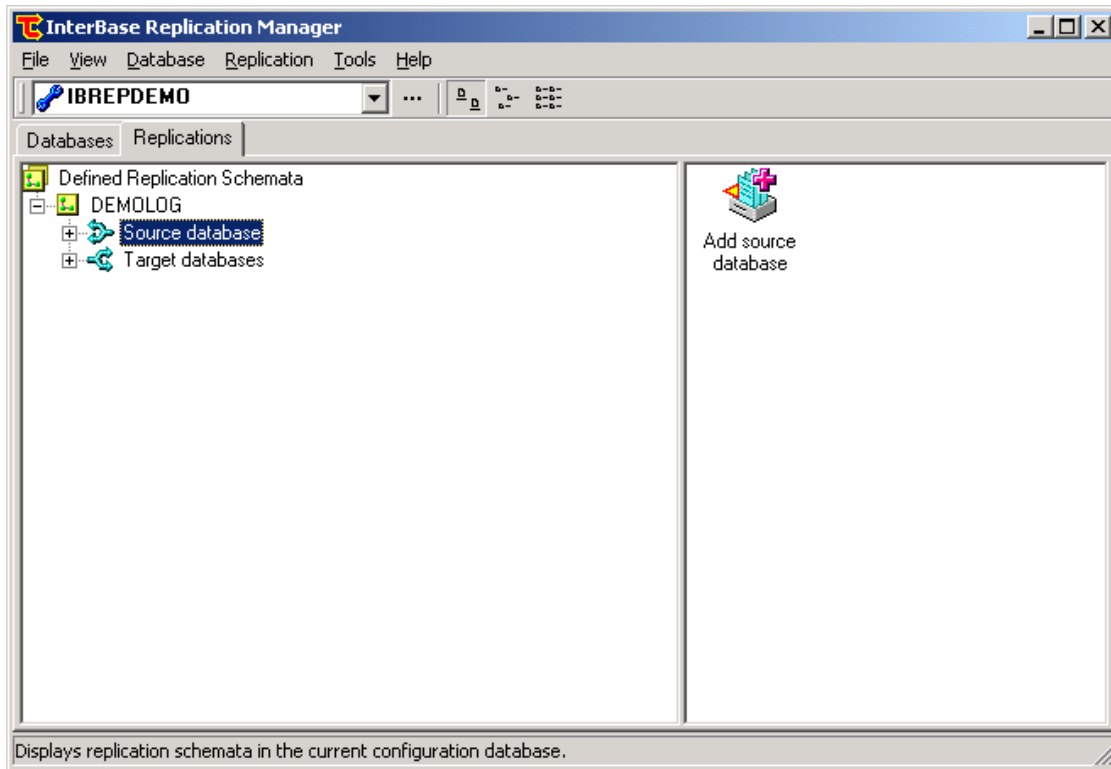
Click **OK** to close the Schema properties form.



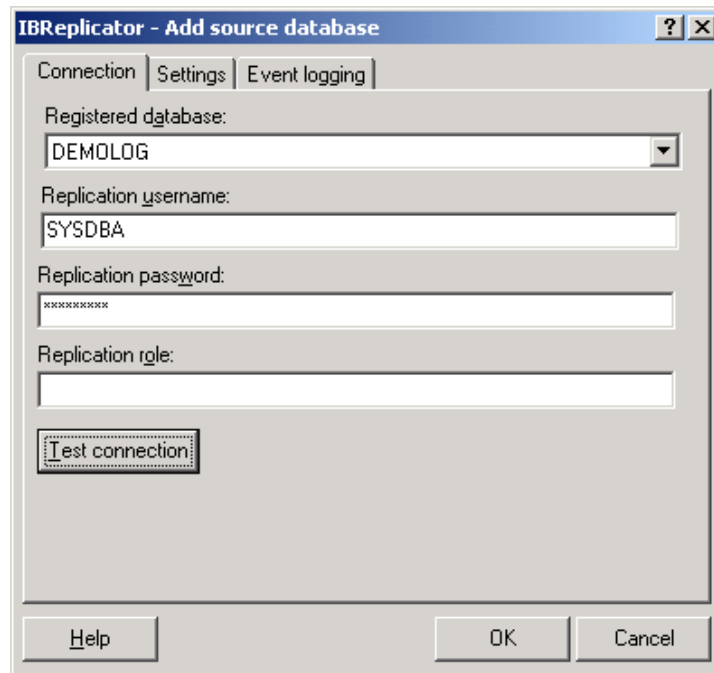
Notice the Schema configuration which now includes the newly added schema.



Expand the tree until **Source database** and **Target database** are shown in the tree, select **Source database** and click the **Add source database** icon shown on the right.

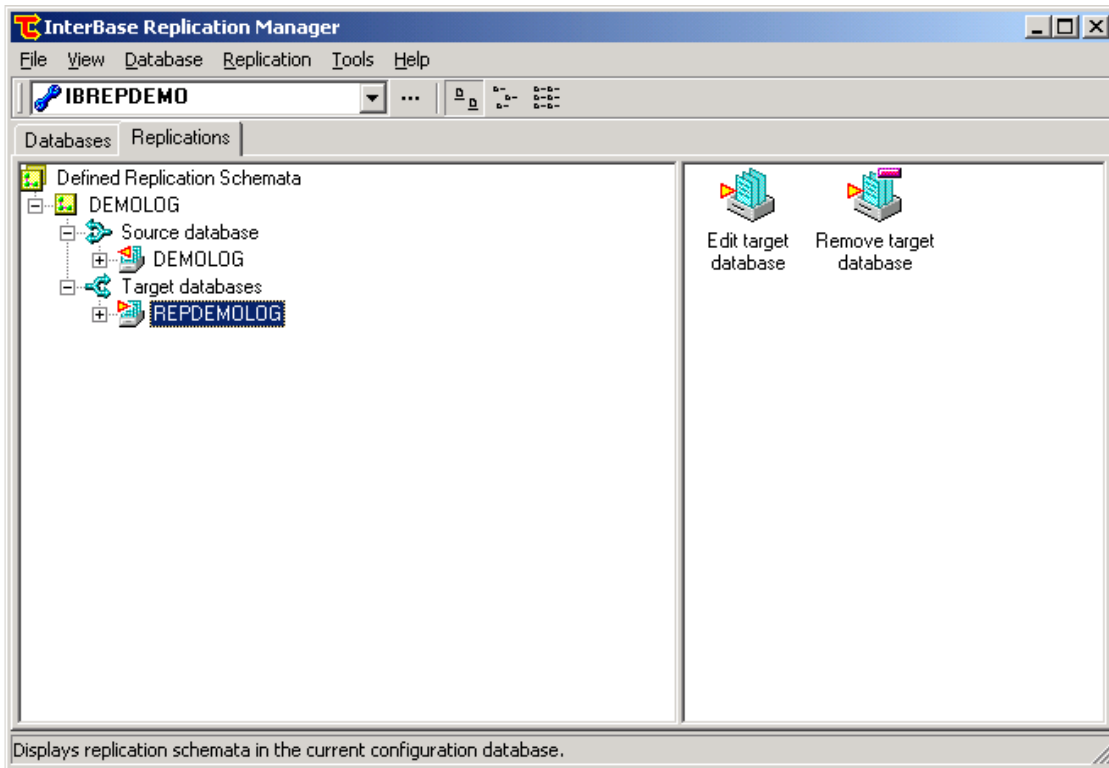


Select the source database from the drop-down list. Re-enter the password for the administrator login. Click **OK** to close the **Add source database** form.

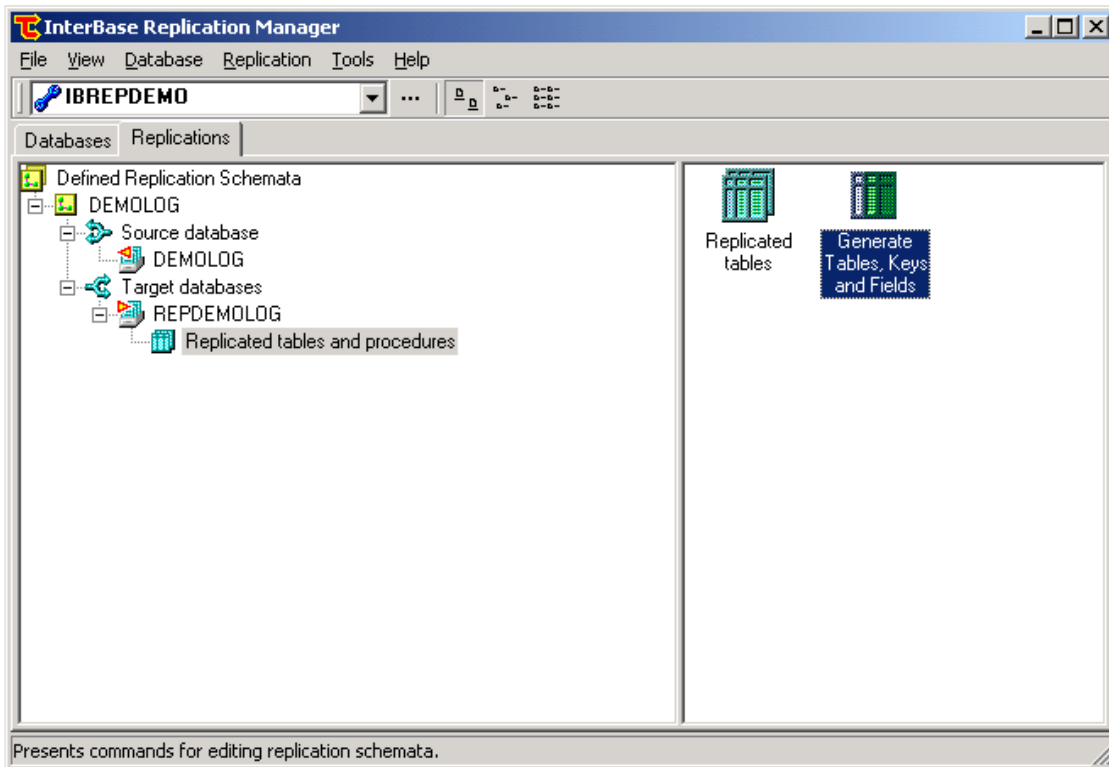


Repeat this process for the target database.

Your Schema configuration should now look something like this, with appropriate names for your project:



Expand the **Target databases** item in the tree.

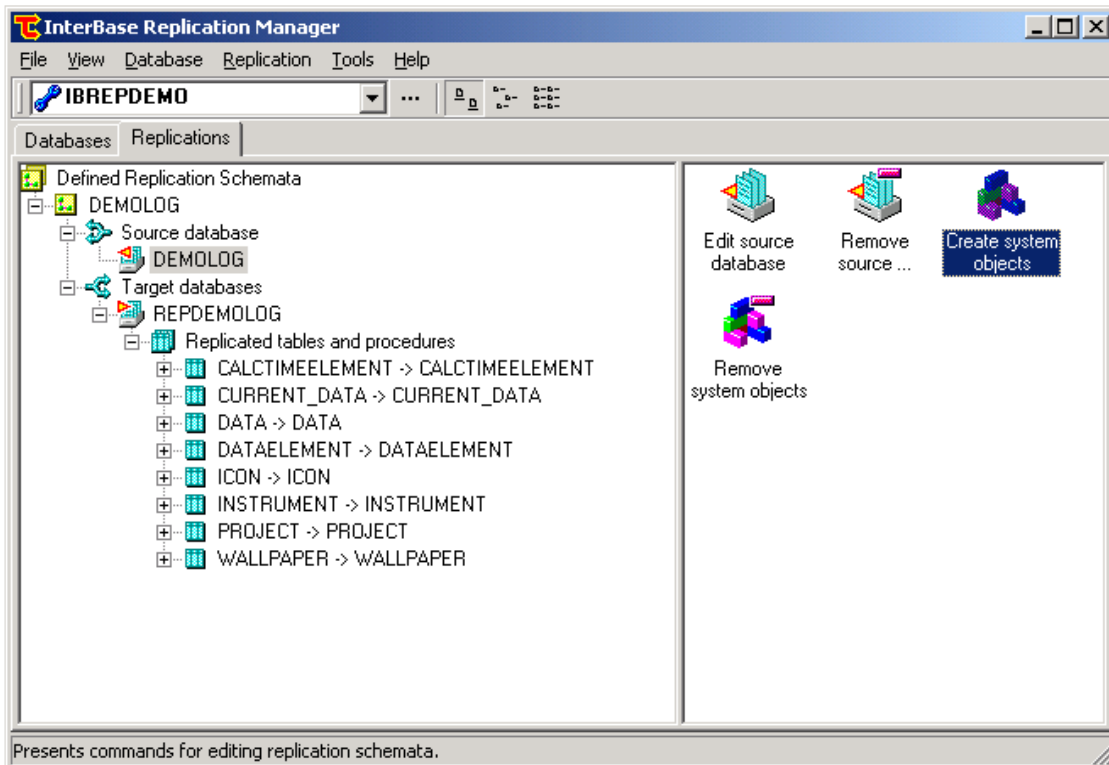


Click on the **Generate Tables, Keys and Fields** icon shown on the right. This will bring up the Auto-Generate Tables, Keys and Fields form. Click **Generate** to automatically generate the Tables configuration. A summary will display at the end if the operation completes successfully. Note any errors shown on this form and **DO NOT PROCEED UNTIL RESOLVED**.

Note: Older MultiLogger database files will require a script to be executed to update the database, contact Canary Systems if any errors show in the listing and to obtain the required script.

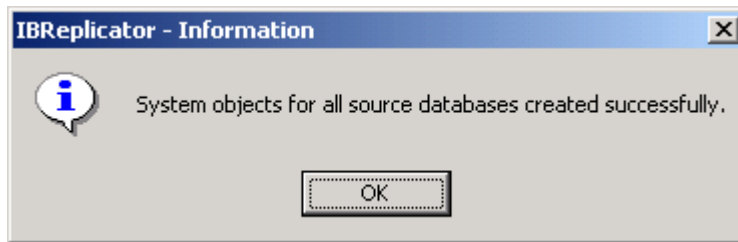


Press Close to return to the Replication Manager form, you should now see your replicated database with a listing of all the Tables to be replicated, as shown below.



Now the Replication Manager must create the System Objects from the source database for replication to function. Click on the **Source database**, notice the **Create system objects** icon.

Double-click **Create system objects**, the following message should display after a few moments:



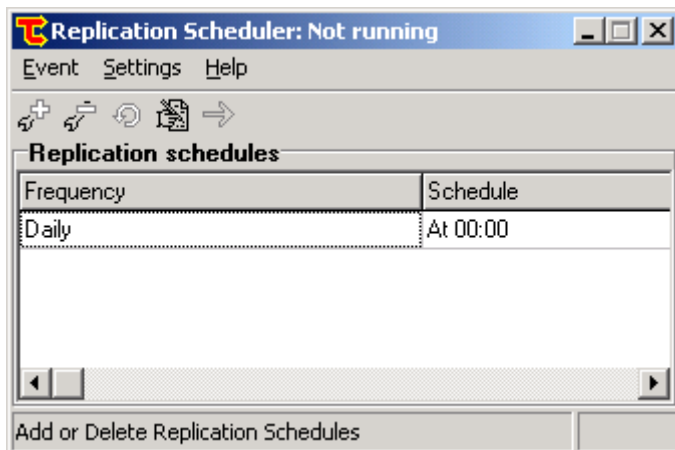
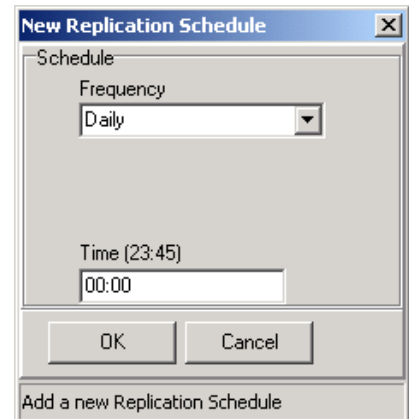
Configuration is almost complete! You have successfully defined your replication configuration and are now ready to complete the setup.

Before proceeding you will need to enter your licensing codes to activate the replication functionality. Use the menu item **Tools | License Manager** to display the license manager. You must have a Server License and at least 1 Replicant License. You will receive these codes on the Invoice from Canary Systems, contact us if you cannot find your licensing codes.

Next the scheduler must be configured. The replication process can actually be performed manually but generally scheduling its operation is more convenient. Select the menu item **Tools | Scheduler** to display the schedule manager.

Select the menu item **Event | Add**, or click the toolbar button, to add a scheduling event. The new Replication Schedule form will display. Select the desired interval and close the form by clicking on the form close button in the upper right corner.

Click OK when finished. The scheduler will display with the new schedule item, the screenshot illustrates a daily replication at midnight.



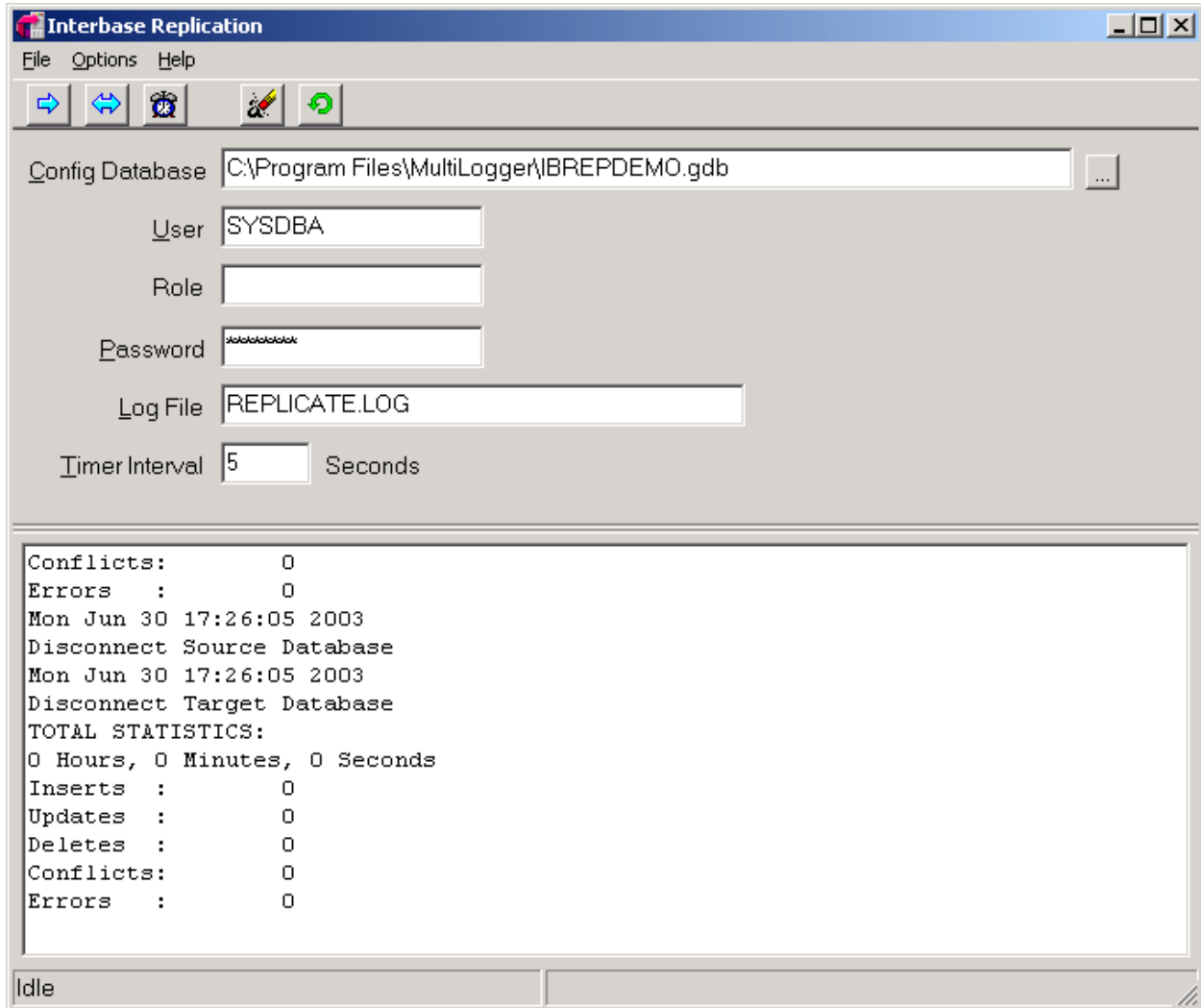
Notice the arrow button on the toolbar. You must press this button to start the scheduler!

The Replication Manager must be running for the scheduling to operate. It is recommended to include the Replication Manager in your startup group on the machine which will initiate replication.

One final step, the Replication Server must be started. This program actually performs the replication function, using the schedule configured using the Replication Manager.

The Replication Server must be installed on the machine hosting the database, it is launched by selecting the **IBReplServer** shortcut in the Programs | IBReplicator group.

The screenshot illustrates a successful replication.



See the Replication Server help file and chapter 11 of the **Interbase Operations Guide** for more information on the Replication Server.