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Replicating the MultiLoggerDB Database using IBReplicator v2

Database Application Note #5

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 “automatically” must 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 are 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 its 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.
- Replicant Licenses – Codes for each database, involved in replication.
- Replication Server License – Codes to allow the Replication Server to function.

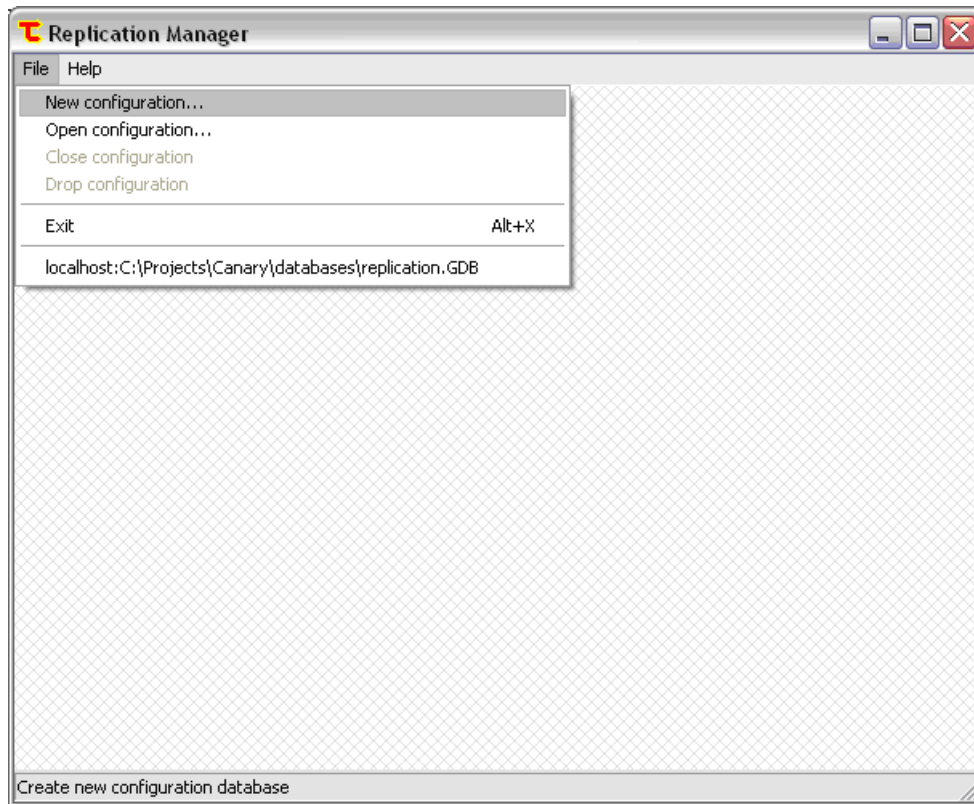
The IBReplicator installer contains both Replication Manager and Replication Server. The invoice you will receive from Canary Systems will detail the license codes required to activate the functionality. The provided IBReplicator installer is for the Windows 2000/XP/2003 platform, other platforms are supported, contact Canary Systems for additional information.

Run the installer and install IBReplicator software. If Replication Manager and Replication Server should be run on different machines, then installer should be run on each machine and appropriate options should be selected during IBReplicator installation. There will be a program group named **IBReplicator** accessible from your **Start | Programs** menu after installation.

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 **Replication Manager** shortcut from the **Programs | IBReplicator** group and click on **File | New configuration...** menu item.



Configuration database form will be shown

Fill in the following fields:

Server name: A name of Firebird server, where replicator configuration database will be stored.

Protocol: Should be TCP/IP, unless advised differently by your database administrator.

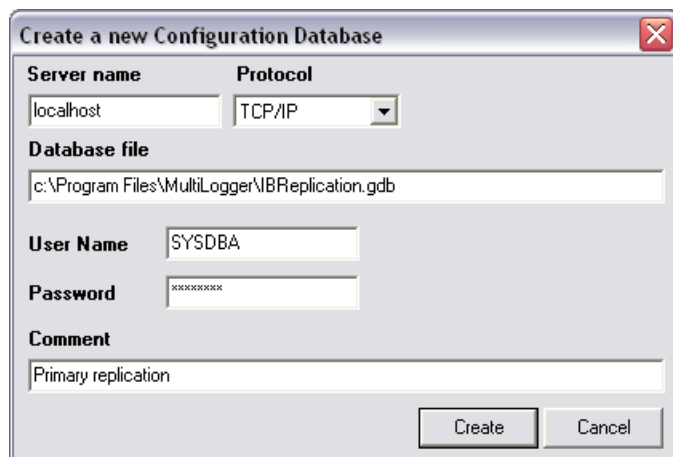
Database File: The path and name of replicator configuration database on the Firebird server. DO NOT USE the MultiLogger GDB file.

User name and Password: The login information for the Firebird server.

Comment: Any appropriate description for this configuration.

An example configuration is shown at right.

Press the **Create** button to create this configuration.



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 server, path and filename to the Source or Target database.

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

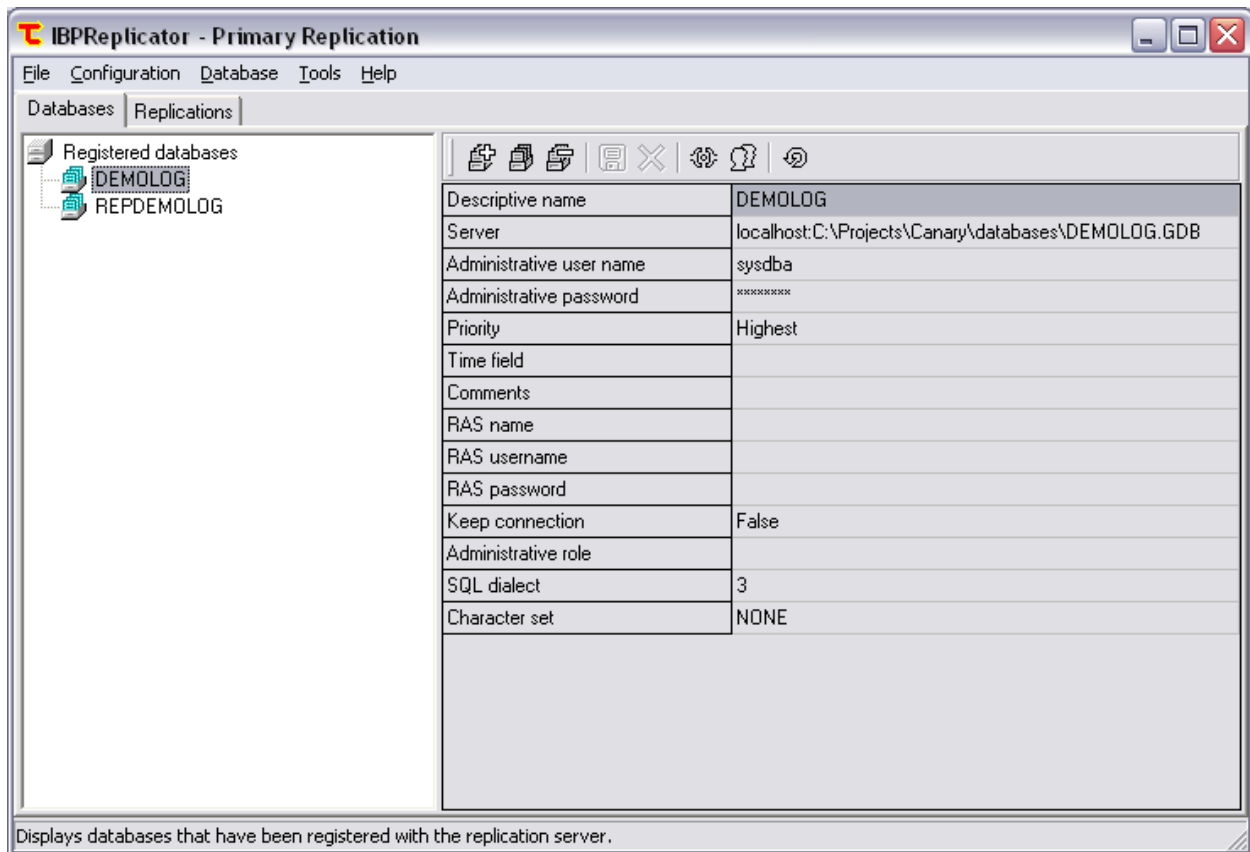
Administrative password: The password for the administrator on the server.

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).

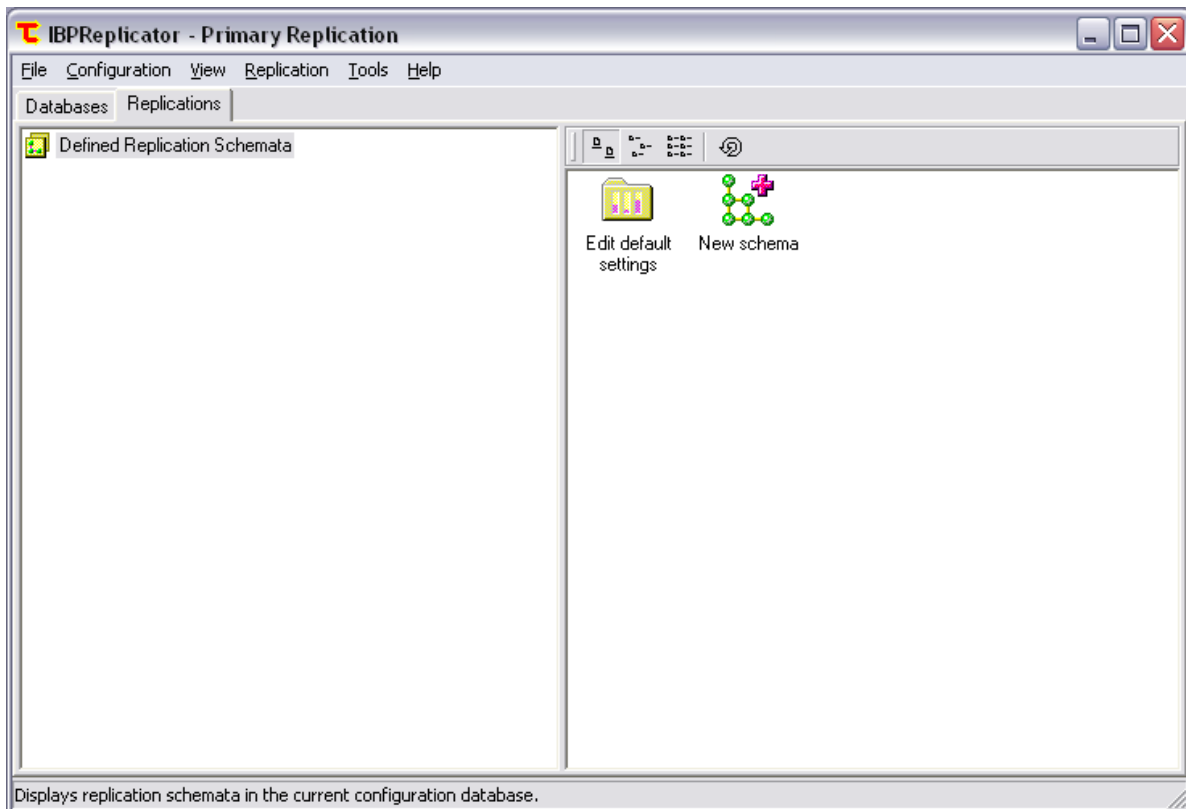
Keep connection: Generally set to false, to disconnect the line after replication is complete.

When the source and target databases are configured you should have a display similar to that shown below. Right-click on the Server field for each database and click on Test Connection to make sure that configuration is correct. Note: The DEMOLOG name was simply used for this example, the actual database names and configuration will be different for your configuration.

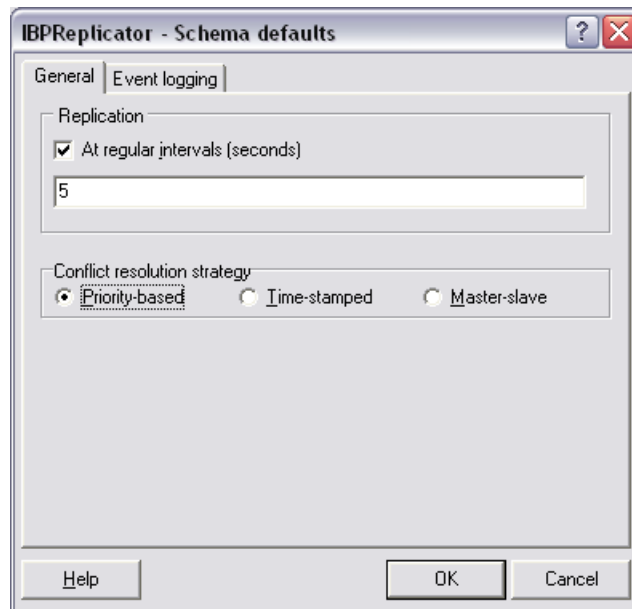


Now the Replication Schema must be defined, or defining what exactly will be replicated from one database to another.

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

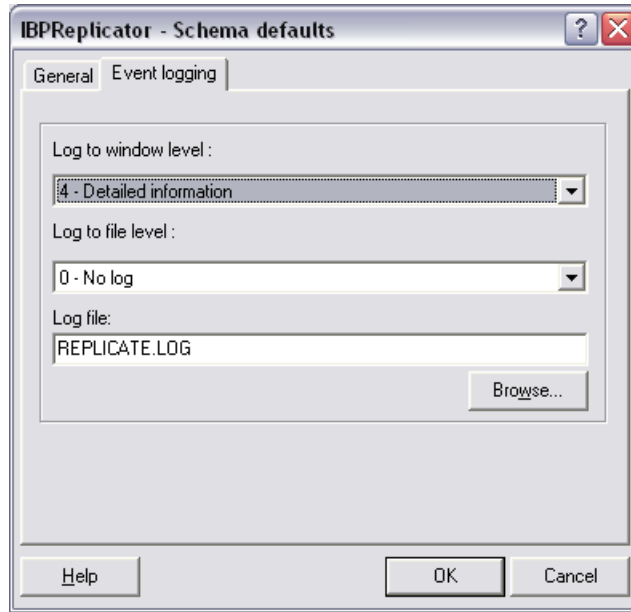


Double-click the **Edit default settings** icon on the right; this displays the Schema defaults form. These settings will be used as the defaults for any new Schema that is created.



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

Make sure **At regular intervals** is checked in the **Replication** group. Switch to **Event logging** tab.

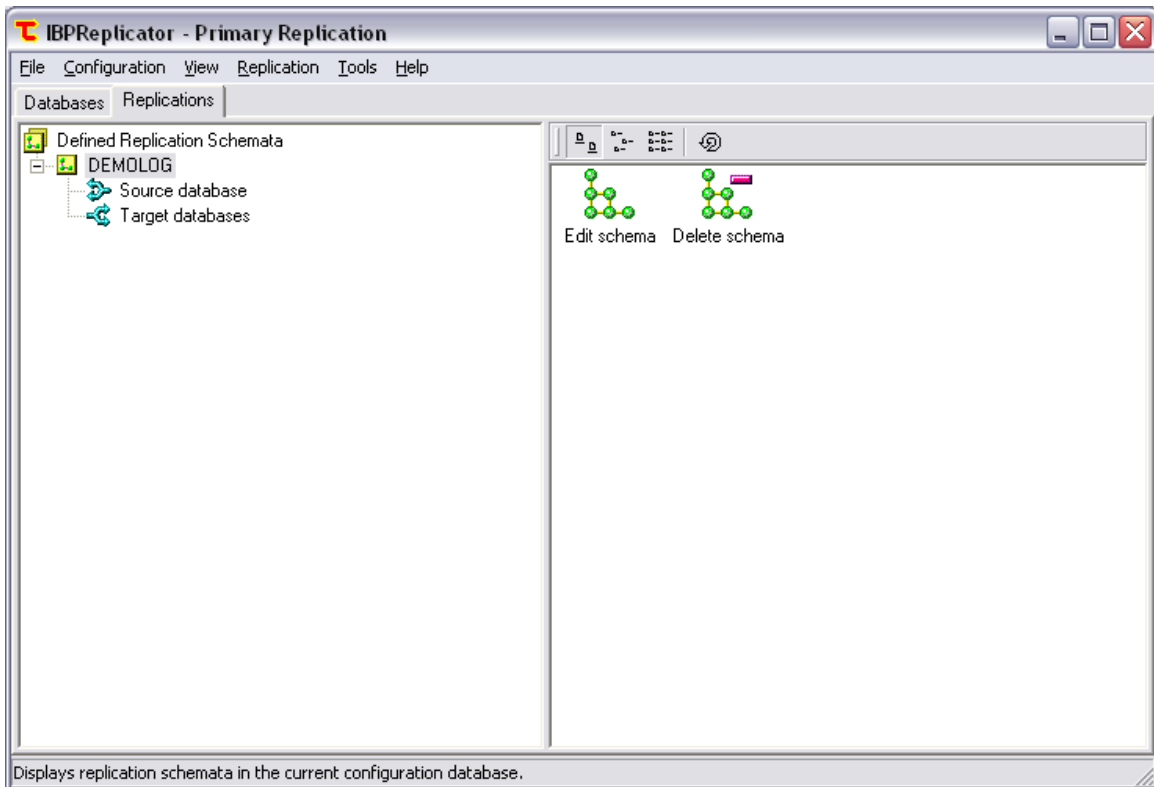


Make sure that **Log to window level** is set to level **4**. You may also want to log these events to a file, but usually the window messages are sufficient.

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

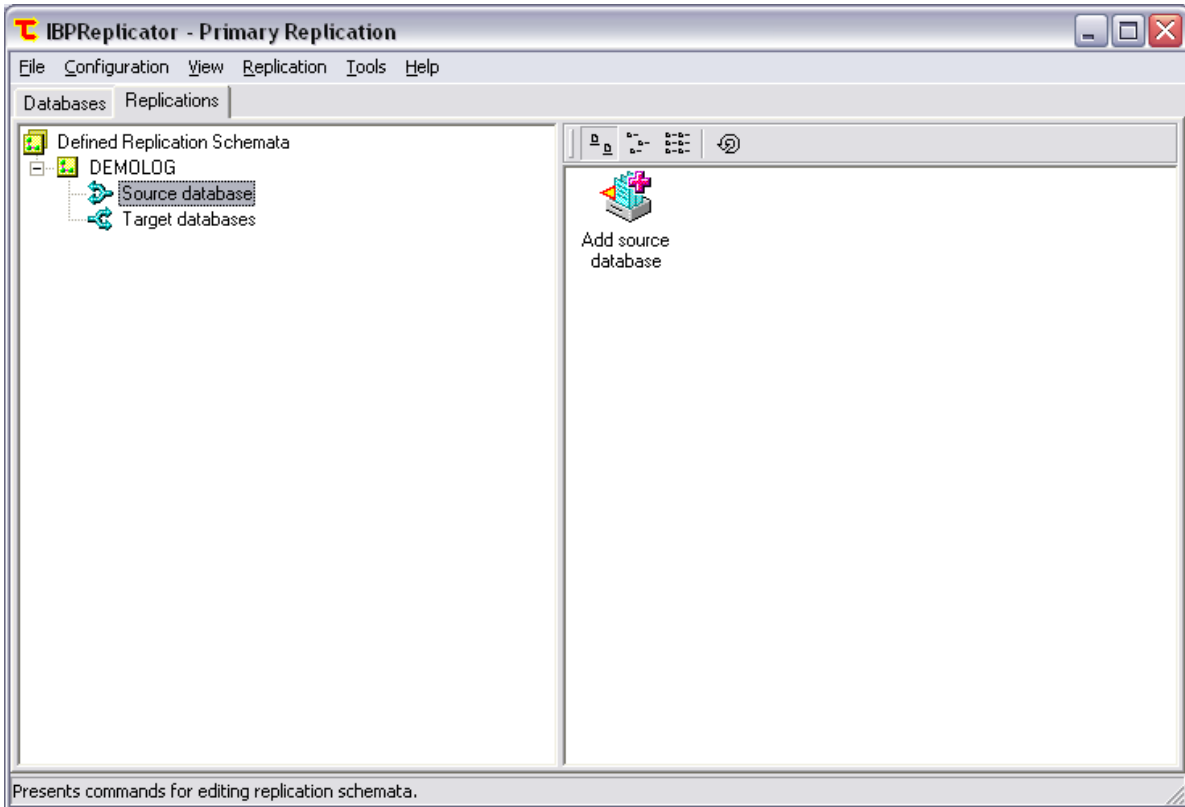
Double-click the **New schema** icon; enter a schema name, using an appropriate name for your project, and click **OK** to create a new schema.

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

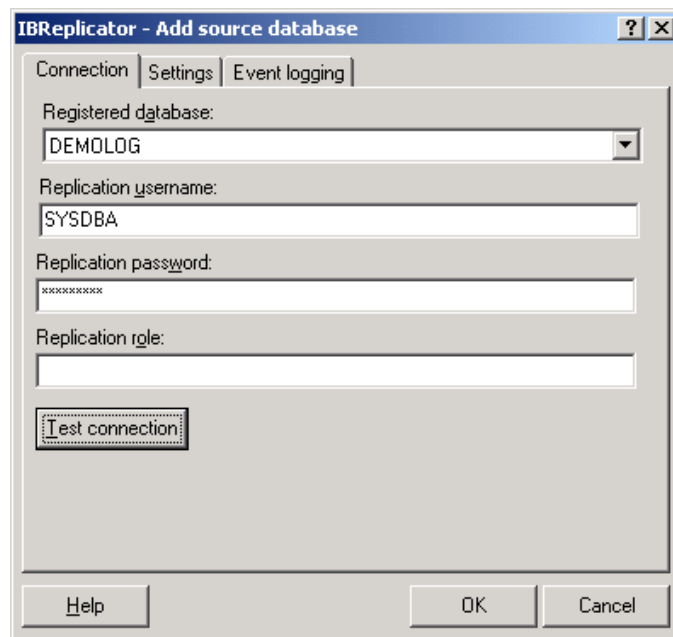


Expand the tree until **Source database** and **Target database** are shown in the tree.

Select **Source database** and double-click the **Add source database** icon shown on the right.

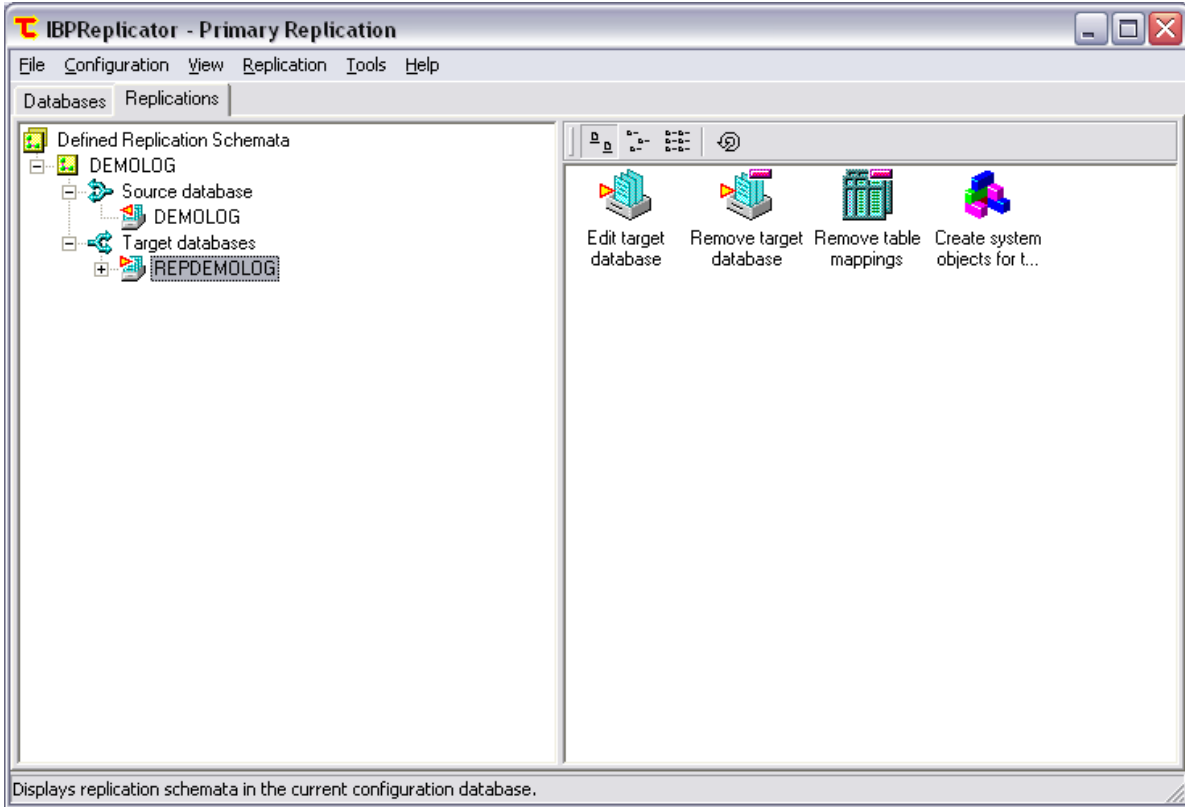


Select the source database from the drop-down list. Re-enter the password for the administrator login. Click **OK** to close the **Add source database** form.

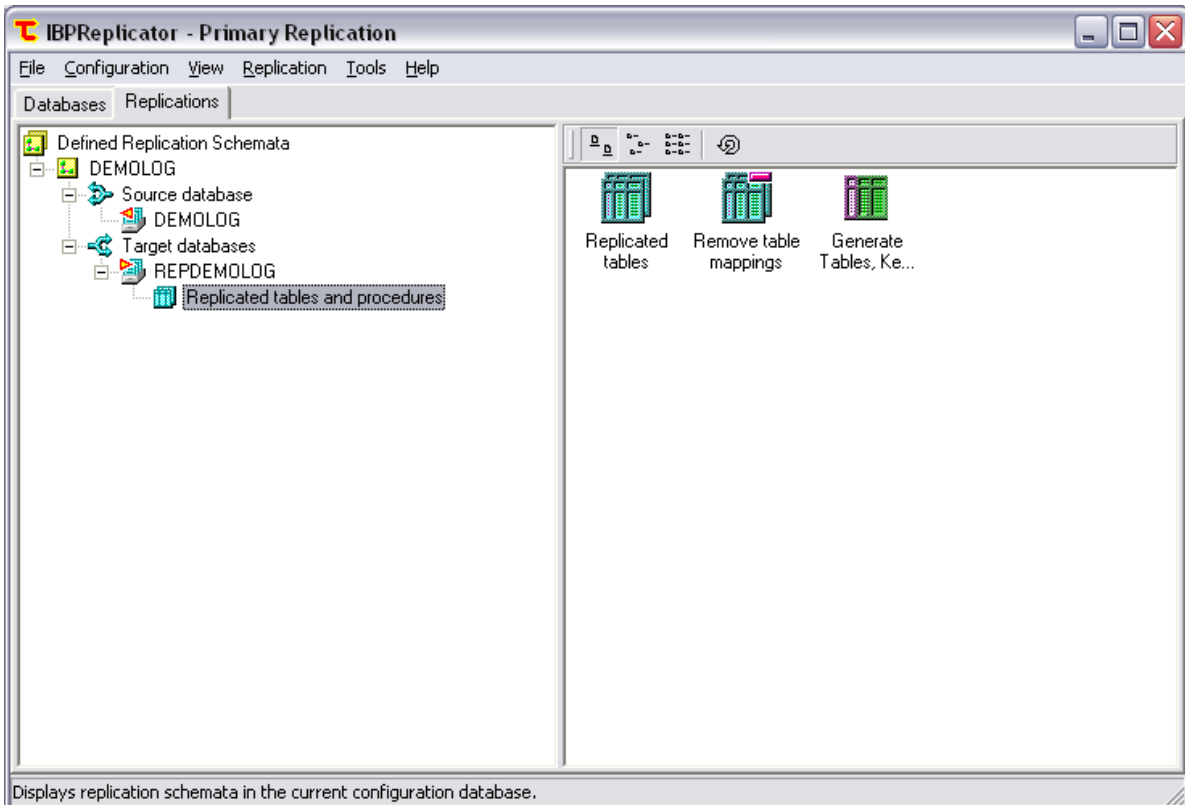


Repeat this process for the target database.

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

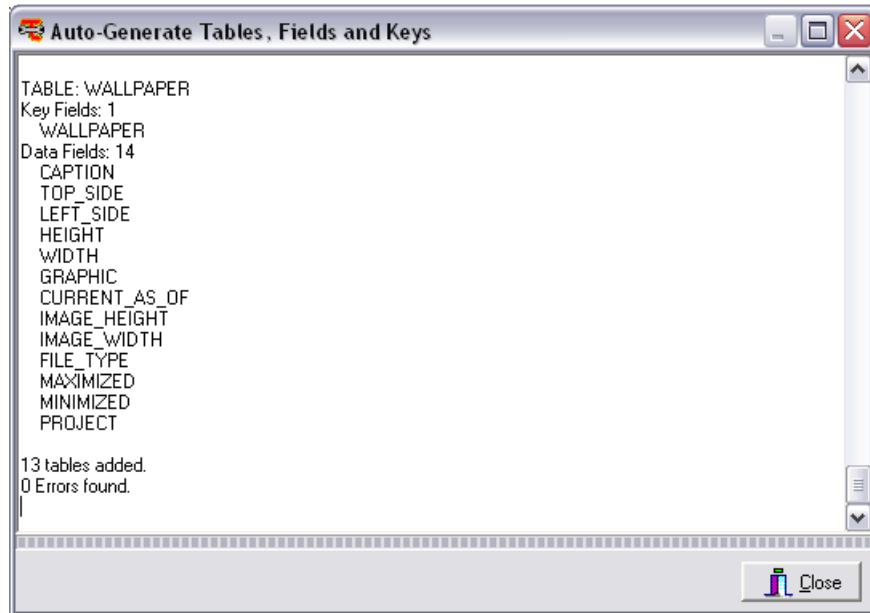


Expand the **Target databases** item in the tree.

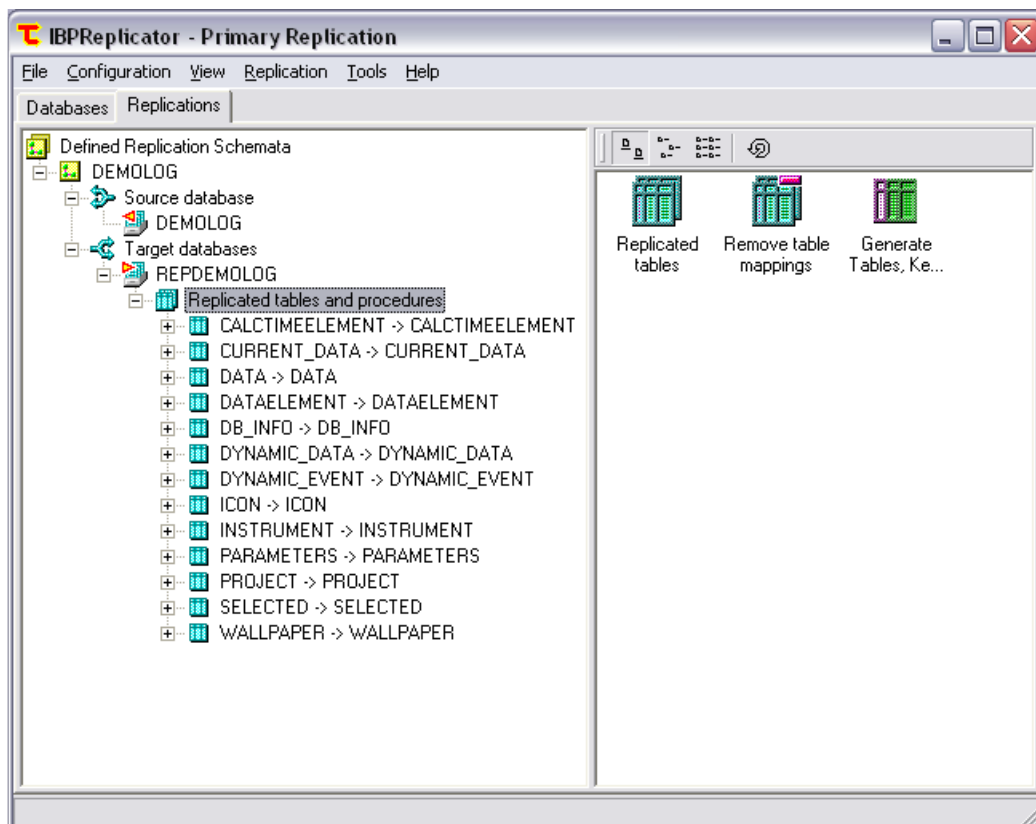


Note: MultiLogger database files with revision prior to revision 10 will require a script to be executed to update the database, contact Canary Systems if any errors show in the listing and to obtain the required script.

Click on the **Generate Tables, Keys and Fields** icon shown on the right 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**.

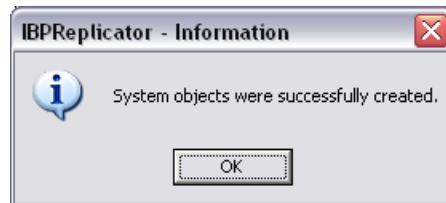


Press Close to return to the Replication Manager form, you should now see your replicated database with a listing of all the Tables to be replicated, as shown below.



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

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



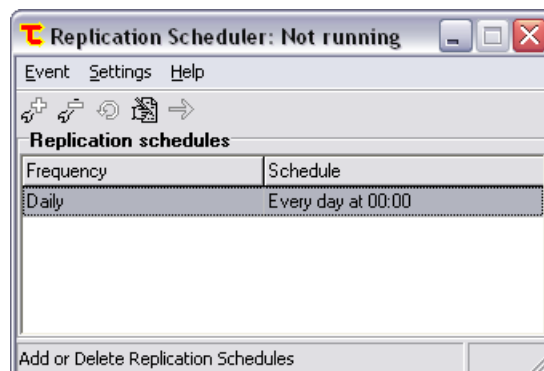
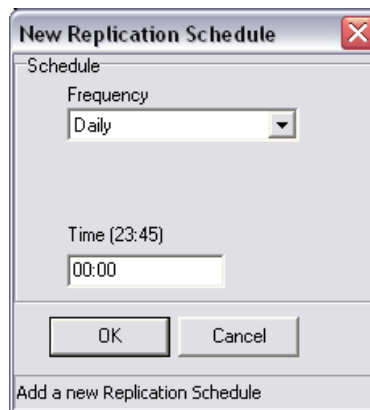
Configuration is almost complete! You have successfully defined your replication configuration and are now ready to complete the setup.

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 for each source or target database. A Server license acts also as a Replicant license, if Replication Server runs on the same machine with one of replicated databases. 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.

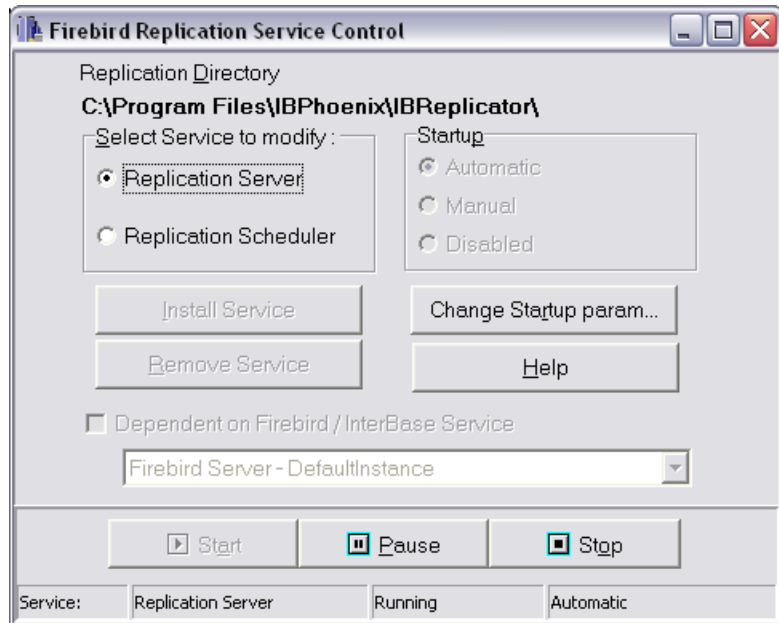


Now replication server and scheduler services need to be installed and started. In Windows **Start | Programs** open **IBReplicator | Configure Services**.

For each **Replication Server** and **Replication Scheduler** service, select **Automatic** in **Startup** box, then click on **Install Service**, and then click on **Start**. Verify that the service is marked as **Running** on the status bar at the bottom.

At this point replication should be fully configured and operational.

See the **Replication Manager** help file for additional information on how to configure and run replication.



Replication status can be monitored in **Replication Monitor**, which can be started from Replication Manager's **Tools | Monitor** menu. See the **Replication Monitor** help file for more information on how to use it.

