

Integration Objects'

Solution for Automatic Data Bridging

OPC Data Transfer
Version 1.4 Rev.1

User's Guide

Compatibility
OPC DA 1.0a
OPC DA 2.00
OPC DA 2.05a

OPC Data Transfer's User Guide Version 1.4 Rev .1
Published April 2016

Copyright © 2006 - 2016 Integration Objects. All rights reserved.

No part of this document may be reproduced, stored in a retrieval system, translated, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Integration Objects.

Windows®, Windows NT® and .NET are registered trademarks of Microsoft Corporation.

TABLE OF CONTENTS

PREFACE.....	8
About This User Guide	8
Target Audience	8
Customer Support Services.....	8
Introduction.....	9
1. Overview	9
2. Features	9
2.1. Data Transfer Between OPC Servers.....	9
2.2. OPC Server Redundancy	9
2.3. Automatic reconnection	9
2.4. Client Redundancy.....	10
2.5. Windows Service Capabilities.....	10
2.6. Log Capabilities	10
3. Typical Architecture	10
4. OPC Compatibility	11
5. System Requirements	11
Getting started.....	12
1. Installing Data Transfer	12
2. Starting-Up Data Transfer Application	13
2.1. Starting Data Transfer As NT Service	13
2.2. Starting Data Transfer As Standard Application	13
3. Stopping Data Transfer Application	15
4. Removing Data Transfer Application	15
4.1. Removing Data Transfer Service.....	15
4.2. Removing Data Transfer.....	15
Data Transfer functionalities	17
1. Session Management.....	17

2.	Multiple OPC Connection & Server Address Space Browsing	17
3.	Data Transfer.....	18
	3.1. Using Drag & Drop Mechanism	19
	3.2. Importing Data Transfer Configuration From XLS/CSV File	20
4.	OPC Server Redundancy	21
5.	Client Redundancy	22
6.	E-Mail Notification.....	23
7.	Log Event Capabilities	24
	User interface	27
1.	User Interface Overview	27
2.	Session Management.....	29
	2.1. Creating A New Session	29
	2.2. Opening An Existing Session.....	29
	2.3. Saving A Session	30
	2.4. Settings Configuration.....	31
	2.5. Shutting Down The Application.....	34
3.	Data Transfer.....	35
	3.1. One To One Mapping	35
	3.2. Many To Many Mapping	37
	3.3. One To Many Mapping	41
	3.4. Data Transfer Display	42
	3.5. Transfer Menu.....	44
4.	Redundancy	45
	4.1. Server Redundancy	46
	4.2. Client Redundancy.....	49
	4.3. Email Notification	51
	Fast DB Log Viewer.....	53
1.	Interface Overview.....	53
2.	Interface Features	54

TABLE OF FIGURES

Figure 1: OPC Data Transfer Typical Architecture.....	9
Figure 2: Launching OPC Data Transfer.....	12
Figure 4: OPC Data Transfer User Interface.....	13
Figure 5: OPC Data Transfer System Tray Icon	13
Figure 6: OPC Data Transfer System Tray Menu	14
Figure 7: Launching Fast DB Log Viewer	14
Figure 8: Shutting down OPC Data Transfer	14
Figure 9: Removing OPC Data Transfer	15
Figure 10: File Menu and Tool bar.....	16
Figure 11: Browsing Servers	17
Figure 12: Connect Manually to an OPC DA Server	17
Figure 17: Drag & Drop to create a transfer operation	18
Figure 18: Transfer Configuration Confirmation Dialog	19
Figure 19: Importing Data Transfer from XLS/CSV file	20
Figure 20: Server Contextual Menu	20
Figure 21: Server Redundancy Configuration Dialog.....	21
Figure 22: Configure Client Redundancy.....	21
Figure 23: Client Redundancy Configuration Dialog	22
Figure 24: E-mail Notification Command	22
Figure 25: E-mail Notification Configuration Dialog.....	23
Figure 26: Log Levels.....	24
Figure 27: OPC Data Bridging	26
Figure 28: OPC Data Transfer User Interface.....	27
Figure 29: Menu bar	28
Figure 30: Tool bar	28
Figure 31: Status bar.....	28
Figure 32: Creating a new session	28
Figure 33: Opening an existing configuration.....	29
Figure 34: Opening an XML configuration file.....	29
Figure 35: Saving the current configuration into an XML file	30
Figure 36: Saving an XML configuration file	30
Figure 37: Settings Configuration	31
Figure 38: Settings Configuration Dialog	33
Figure 41: Exiting OPC Data Transfer	34
Figure 42: One to One Mapping	34
Figure 43: Transfer Configuration Confirmation Dialog	35
Figure 44: Creating a source tags collection	37
Figure 45: Creating a destination tags collection	38
Figure 46: Many to Many Mapping	38
Figure 47: Many to Many Mapping Configuration	39
Figure 48: Collection Contextual Menu.....	40
Figure 49: Duplicate a source OPC item.....	41
Figure 50: Data Transfer Display.....	42
Figure 51: Data Transfer Display Table Menu	42
Figure 52: Editing the write mode of a transfer operation.....	43
Figure 53: run/stop/remove a transfer operation.....	43

Figure 54: Transfer Menu and Tool bar	44
Figure 55: Redundancy Menu and Tool bar.....	44
Figure 56: Server Redundancy Configuration	45
Figure 57: Server Redundancy Configuration of the selected server	45
Figure 58: OPC Servers browsing	46
Figure 59: Backup Server Redundancy Mode	47
Figure 60: Add/Remove Backup Server	48
Figure 61: Client Redundancy Configuration Dialog	49
Figure 62: Browsing the network	49
Figure 63: E-mail Notification Configuration.....	50
Figure 64: File Attachments.....	51
Figure 65: Fast DB Log Viewer Interface	53
Figure 66: Display Modes	53

LIST OF TABLES

Table 1: Installed Files List	13
Table 2: Configuration Parameters.....	34

PREFACE

About This User Guide

This guide:

- Describes the main features provided by the OPC Data Transfer
- Lists the system requirements for installing and running the OPC Data Transfer
- Explains how to configure OPC data transfer operations
- Explains how to use and run the OPC Data Transfer application

Target Audience

This document is intended for Integration Objects' OPC Data Transfer users. Basic knowledge of OPC DA (Data Access) specifications is assumed.

Customer Support Services

Phone	Email
Americas: +1 713 609 9208	Support: customerservice@integrationobjects.com
Europe-Africa-Middle East +216 71 195 360	Sales: sales@integrationobjects.com Online: www.integrationobjects.com

INTRODUCTION

1. Overview

The OPC Data Transfer is a high performance OPC solution designed to configure, display and monitor:

- Data transfer between OPC servers
- OPC server redundancy
- Client redundancy

Its HMI (Human Machine Interface) allows the end-user to easily configure and visualize these functionalities.

2. Features

Integration Objects' OPC Data Transfer features include:

2.1. Data Transfer Between OPC Servers

This OPC solution facilitates the DA data transfer from any OPC compliant source server to any OPC compliant destination server. You can configure transfers based on one to one mapping as well as on many to many mapping by easily dragging & dropping tags.

2.2. OPC Server Redundancy

For any master OPC server, OPC Data Transfer allows you to configure more than one backup server using three different redundancy modes. When the master fails, OPC Data Transfer automatically switches to the backup server and a notification e-mail is sent to the operator (when e-mail notification is configured). When the master goes up, OPC Data Transfer automatically switches over from the backup server to the master.

OPC Server Redundancy is available for source and destination servers.

2.3. Automatic reconnection

When there are no backup servers configured for the master server, OPC Data Transfer will automatically try to reconnect to the primary server.

2.4. Client Redundancy

In addition to server redundancy, the OPC Data Transfer allows the end-user to configure a primary OPC Data Transfer Client and a backup OPC Data Transfer Client. When a fail-over of the primary client occurs, the backup loads and executes the configuration already running in the master node and an e-mail notification is sent to the operator (when e-mail notification is configured).

2.5. Windows Service Capabilities

OPC Data Transfer can be installed as Windows NT service or as a standard application.

2.6. Log Capabilities

OPC Data Transfer performs extensive error tracking and management thus offering the user many ways to monitor all running operations:

- All log messages are saved in a fast data base
- The HMI also keeps track of the configuration operations requested. The HMI log messages can be saved in a text file
- The user is allowed to use six different log levels

3. Typical Architecture

OPC Data Transfer is developed to offer its users the implementation of different types of architectures. The figure below shows a typical architecture. In this architecture, OPC Data Transfer is connected to various source and destination OPC servers (local or remote). Each server can have a backup server. Data Transfer switches over to the backup server when a master server failover is detected and will switch over to the master server when it is back on and detected to be reconnected.

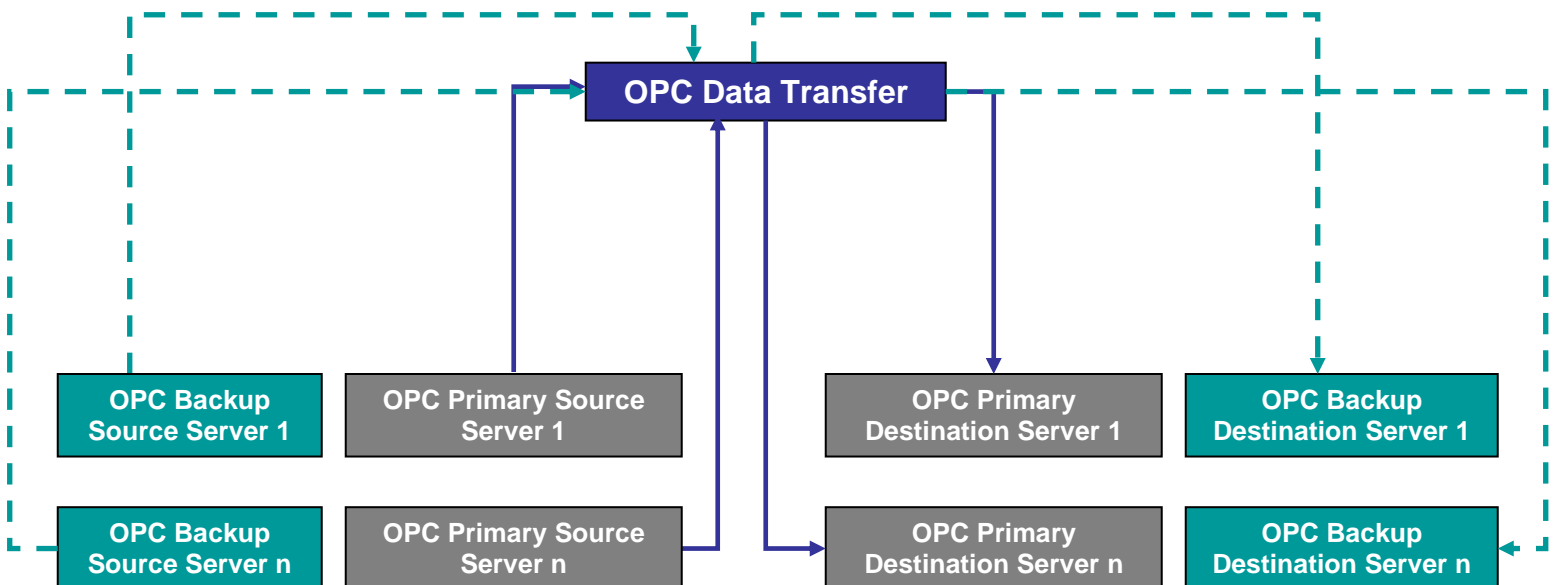


Figure 1: OPC Data Transfer Typical Architecture

4. OPC Compatibility

Currently, OPC Data Transfer is fully OPC Data Access 1.0a, 2.00 and 2.05a specifications compliant.

5. System Requirements

OPC Data Transfer was successfully installed and executed under the following operation systems:

- Windows 2003 Server (SP1)
- Windows XP (SP1 & SP2 & SP3)
- Windows Seven
- Windows Server 2008

Installing and running the application should be using administrator account.

GETTING STARTED

This section explains how to install, run and remove OPC Data Transfer application.

1. Installing Data Transfer

In order to install OPC Data Transfer, the user should proceed with the following steps:

- Open the installation CD and double click the exe file *DataTransferSetup.exe*. This will launch the installation wizard.
- Follow the installation wizard as it guides you through the different setup steps.
- If you want to install OPC Data Transfer as a Windows NT service, you have to check “Install Integration Objects' OPC Data Transfer as NT service” option at the end of the wizard.
- Click *Finish*.

The installation wizard copies all necessary files (refer to Table 2) to the target folder, creates a shortcut icon to launch Data Transfer from the start menu and the desktop and makes an un-installation entry in the Add/Remove Programs in the Control Panel.

File Name	File Description
DataTransfer.exe	OPC Data Transfer Configuration Tool
COMDataTransfer.exe	OPC Data Transfer COM Component
DataTransferProxy.dll	OPC Data Transfer Proxy Library
DataTransferService.exe	OPC Data Transfer executable which can run as NT service
Log.dll	Log Event Library
LogViewer.exe	Fast Database Log Viewer
Fastdb.dll	Fast Database Library
OPCDK.dll	OPC Client Library
OPCDAClientDK-CfgFile.ini	Configuration File used by OPCDK.dll

Settings.ini	Configuration File used by Data Transfer
License.io	License File
DataTransfer.pdf	Data Transfer User Guide

Table 1: Installed Files List

During the installation, the setup wizard gives you the option to install and manage Data Transfer as a service instead of a local executable. If you skip this option for later on, you can manually install it as NT service by using the [-i] command line parameter.

For example, from the command prompt window, you type:

```
Prompt> DataTransferService.exe -i
```

Prompt is the path of the target directory where the DataTransferService.exe is located.

A new service is automatically added with service name "DataTransferService". Next, you may be required to configure your service by using the service control manager.

2. Starting-Up Data Transfer Application

2.1. Starting Data Transfer As NT Service

When OPC Data Transfer is installed as NT service, it will run automatically during windows start up. You can also start/stop it from the service control manager.

2.2. Starting Data Transfer As Standard Application

OPC Data Transfer is started manually from its shortcut under the Programs menu:

Start → Programs → Integration Objects → OPC Data Transfer → OPC Data Transfer.

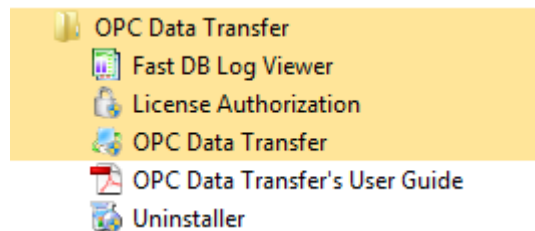


Figure 2: Launching OPC Data Transfer

Once running the OPC Data Transfer, the user interface as shown in the figure below:

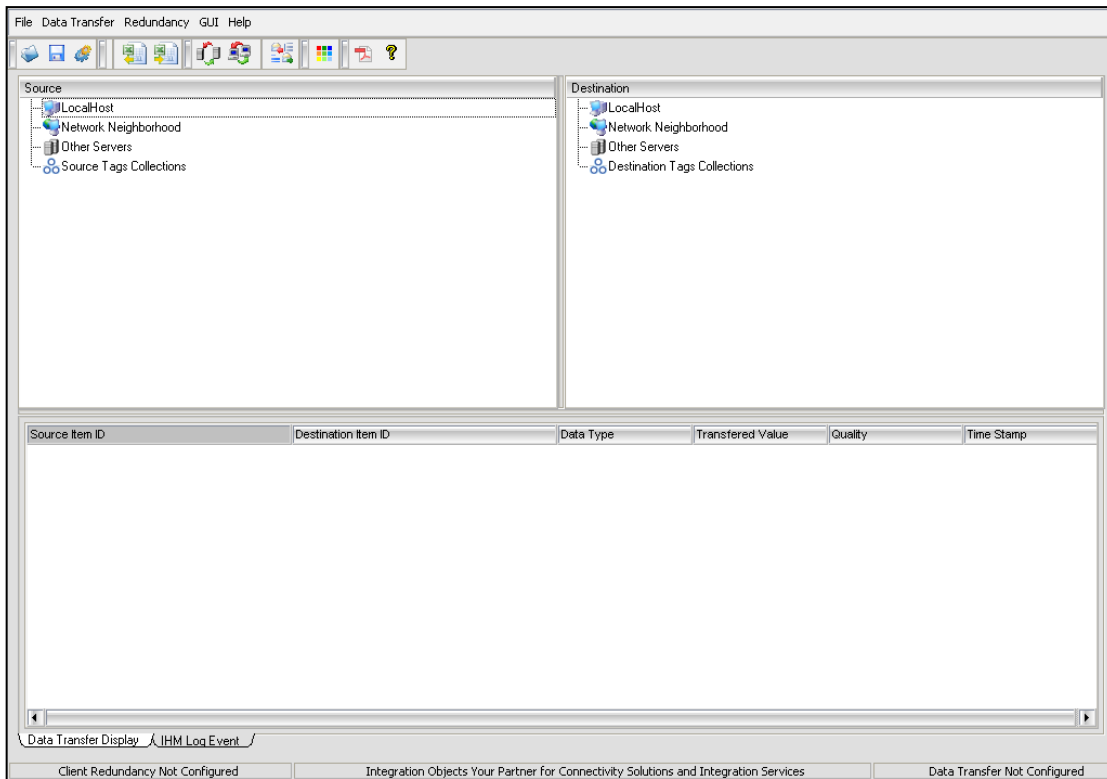


Figure 4: OPC Data Transfer User Interface

An icon in the windows system tray will also be displayed (see Figure 4).

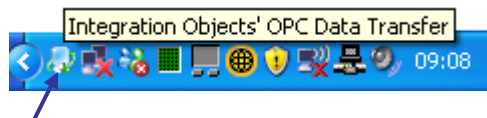


Figure 5: OPC Data Transfer System Tray Icon

Using a right-click in the system tray icon, a contextual menu will be displayed allowing you to show/hide the Data Transfer user interface, to display the about box or to shut down the application (see Figure 5).

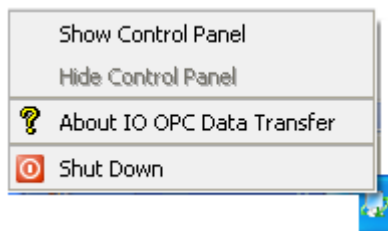


Figure 6: OPC Data Transfer System Tray Menu

To launch Fast DB Log Viewer, click on **Start** → **Programs** → **Integration Objects** → **OPC Data Transfer** → **Fast DB Log Viewer**.

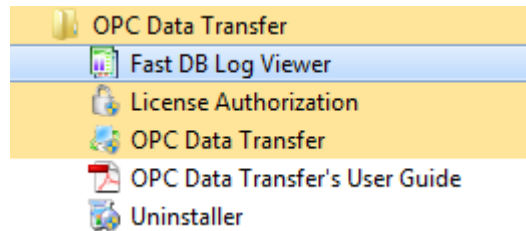


Figure 7: Launching Fast DB Log Viewer



Before starting to work with OPC Data Transfer, make sure you have the settings configuration that suits your needs (refer to settings configuration section).

3. Stopping Data Transfer Application

To stop OPC Data Transfer, use the 'Shut Down' action in the system tray icon menu as shown in the figure below:

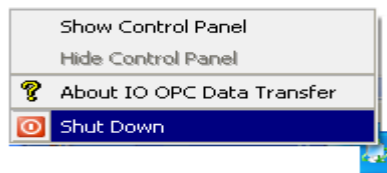


Figure 8: Shutting down OPC Data Transfer

4. Removing Data Transfer Application

4.1. Removing Data Transfer Service

If you only want to remove Data Transfer service, you can un-install it by using the [-u] command line parameter. For example, from the command prompt window, you type:

```
Prompt> DataTransferService.exe -u
```

Prompt is the path of the target directory where the DataTransferService.exe is located.

If the Data Transfer is un-installed as NT service, it can still be launched as executable.

4.2. Removing Data Transfer

To remove the OPC Data Transfer from your machine, just click the *Uninstaller* shortcut icon from the start menu, as shown in the figure below.

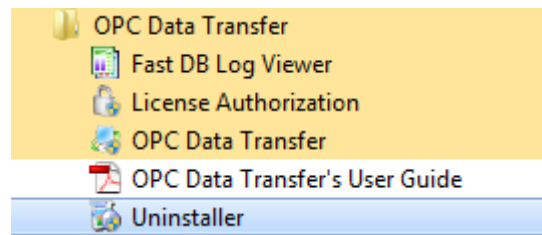


Figure 9: Removing OPC Data Transfer

The OPC Data Transfer can also be removed manually as follows:

1. Go to the Control Panel.
2. Click *Add/Remove Programs*.
3. In Add/Remove Programs dialog screen select "Integration Objects' OPC Data Transfer".
4. Click *Change/Remove* then *OK*.

DATA TRANSFER FUNCTIONALITIES

In this part, we'll explain the functions implemented in the current version of the OPC Data Transfer and quickly describe how to configure these features.

1. Session Management

Once the OPC Data Transfer is launched, a new session is created.

The 'File' menu allows the end-user to manage sessions:

- You can open an existing configuration file by clicking *Open* and selecting the corresponding XML file.
- The 'Save' action allows you to save your current configuration into an XML file.
- The 'Settings' action will enable the user to configure the application settings (refer to Section 2.4).
- If you click the *Display Log Viewer* action, it will display a table showing the log messages stocked in the Fast DB.
- Click *Exit* to close the application.

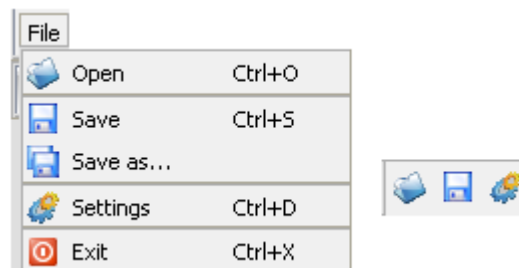


Figure 10: File Menu and Tool bar

2. Multiple OPC Connection & Server Address Space Browsing

Using OPC Data Transfer, you can connect to different OPC DA servers (local or remote) at the same time. By double clicking on the server progID, you can connect to the server and browse its address space as shown in the figure below.

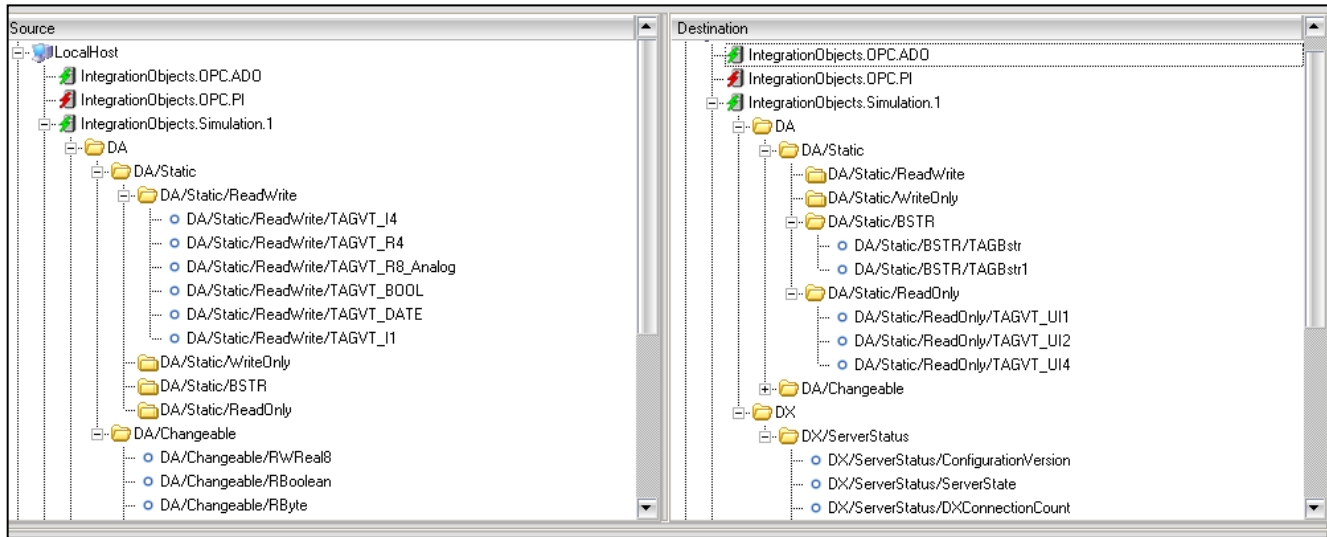


Figure 11: Browsing Servers

You can also browse available source or destination DA server lists in local or remote machines. You also have the ability to manually connect to a DA server by clicking the *Other Servers* item located in the source/destination list. You'll obtain the window shown in the figure below:

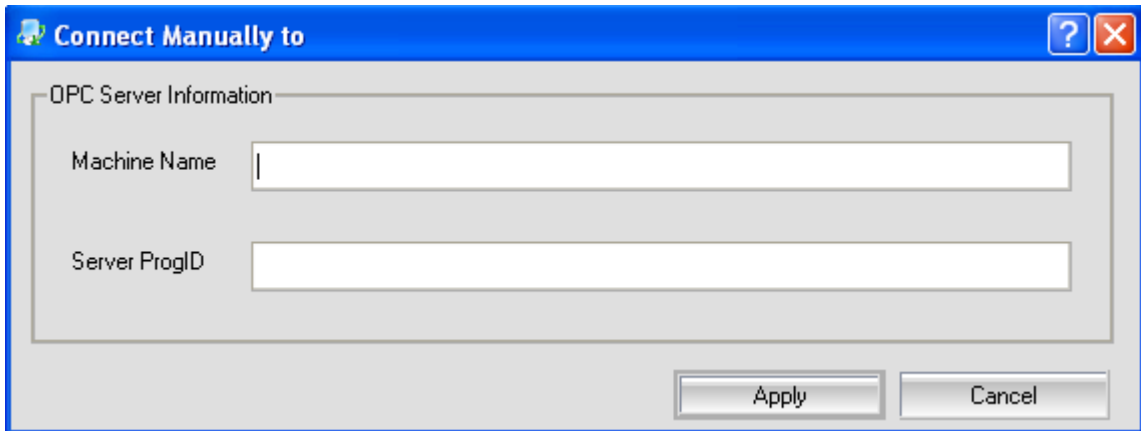


Figure 12: Connect Manually to an OPC DA Server

The 'Machine Name' holds the host name (or the IP address) of the machine where the OPC server is located. The 'Server ProgID' is the progID of the server you're targeting.

3. Data Transfer

To configure data transfer, you have to create a transfer operation. A transfer operation is a pair of tags (source tag, destination tag). The source tag will provide the data values to be written in the destination tag.

The HMI of Data Transfer offers two main ways to associate a source tag to a destination tag.

3.1. Using Drag & Drop Mechanism

To associate a source tag **TAG1** to a destination tag **TAG2**, you can easily drag **TAG1** from the source list view and drop it into the **TAG2** of destination list view (see figure below).

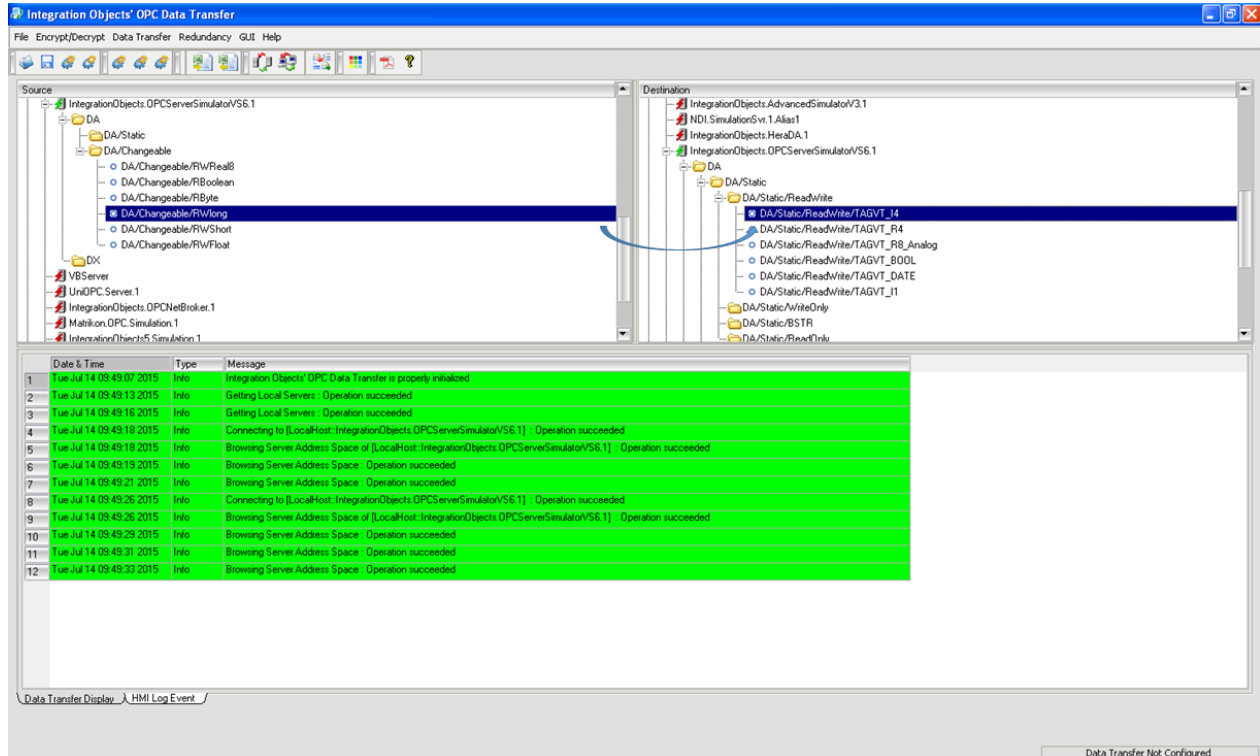
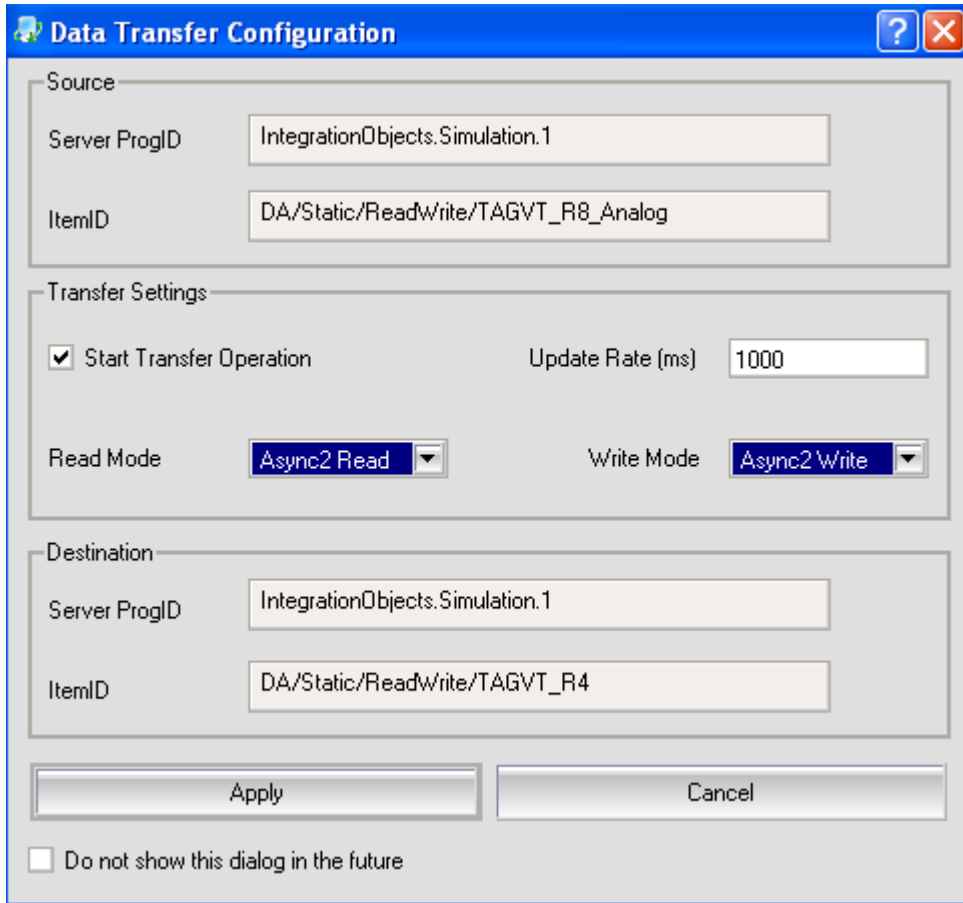


Figure 17: Drag & Drop to create a transfer operation

After the drag & drop, a confirmation dialog will appear (see figure below):



The dialog box is titled "Data Transfer Configuration" and contains the following sections:

- Source:**
 - Server ProgID: IntegrationObjects.Simulation.1
 - ItemID: DA/Static/ReadWrite/TAGVT_R8_Analog
- Transfer Settings:**
 - Start Transfer Operation
 - Update Rate (ms): 1000
 - Read Mode: Async2 Read
 - Write Mode: Async2 Write
- Destination:**
 - Server ProgID: IntegrationObjects.Simulation.1
 - ItemID: DA/Static/ReadWrite/TAGVT_R4

At the bottom, there are "Apply" and "Cancel" buttons, and a checkbox labeled "Do not show this dialog in the future".

Figure 18: Transfer Configuration Confirmation Dialog

To confirm the association that you made, click the *Apply* button. Otherwise, click the *Cancel* button.

You can choose not to show this confirmation dialog in the future by checking the option '*Do not show this dialog in the future*' available at the bottom of the dialog. In this case, the transfer settings will be the default settings stated in the settings (Refer to the settings configuration section).

3.2. Importing Data Transfer Configuration From XLS/CSV File

In addition to the graphical configuration way, the end user can configure data transfer by importing tag mapping from an XLS or a CSV file using the 'Import from XLS/CSV file' command available at the 'Data Transfer' menu.

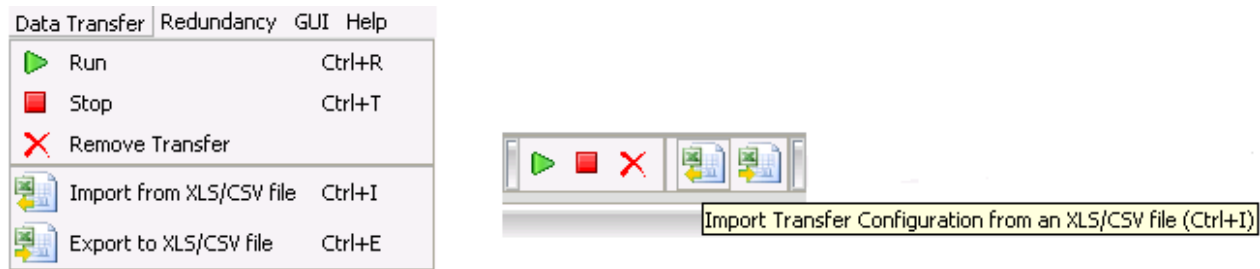


Figure 19: Importing Data Transfer from XLS/CSV file

The XLS/CSV file should have the following format:

Source Machine	Source ProgID	Source Tag	Destination Machine	Destination Server	Destination Tag	Transfer State	Read Mode	Write Mode	Update Rate

- Source Machine: the name of the machine where the source server is running.
- Source Server: the ProgID of the source server.
- Source Tag: the item ID of the source tag.
- Destination Machine: the name of the machine where the destination server is running.
- Destination Server: the ProgID of the destination server.
- Destination Tag: the item ID of the destination tag.
- Transfer State: this indicates if the transfer operation is started (1) or stopped (0).
- Read Mode: the read mode used to read data from the source server (0 for the asynchronous mode 2.0, 1 for asynchronous mode 1.0a and 3 for synchronous mode).
- Write Mode: the write mode used to write data to the destination server (4 for the asynchronous mode 2.0, 5 for asynchronous mode 1.0a and 7 for synchronous mode).
- Update Rate: the value of the source update rate.

4. OPC Server Redundancy

In addition to implementing an automatic reconnection procedure, the Data Transfer application allows the end-user to configure a backup server for any OPC master server. To do so, right click on the master server.

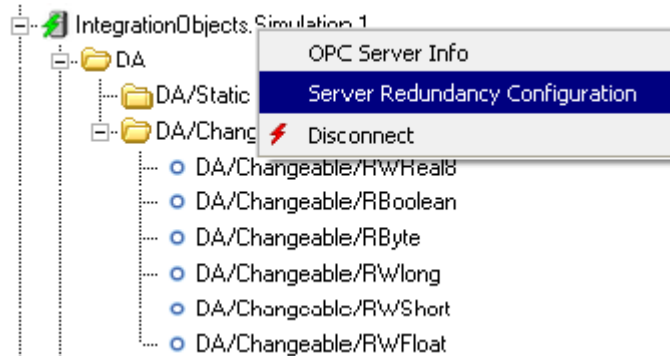


Figure 20: Server Contextual Menu

By choosing the 'Server Redundancy Configuration', you'll get the following dialog screen allowing you to configure one or more backup servers.

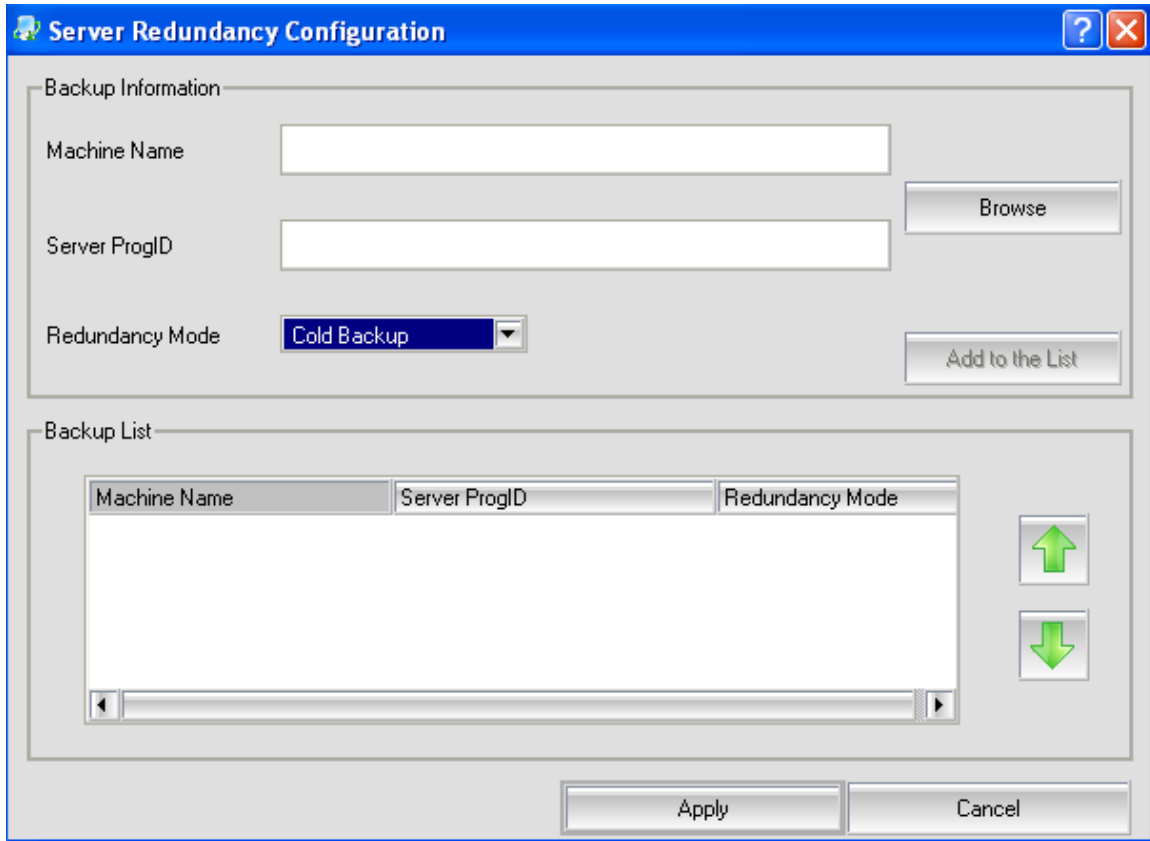


Figure 21: Server Redundancy Configuration Dialog

5. Client Redundancy

To configure a backup for the data transfer application, proceed to the following steps:

1. Click the *Client Redundancy* available in the Redundancy menu.



Figure 22: Configure Client Redundancy

You'll receive the following dialog:

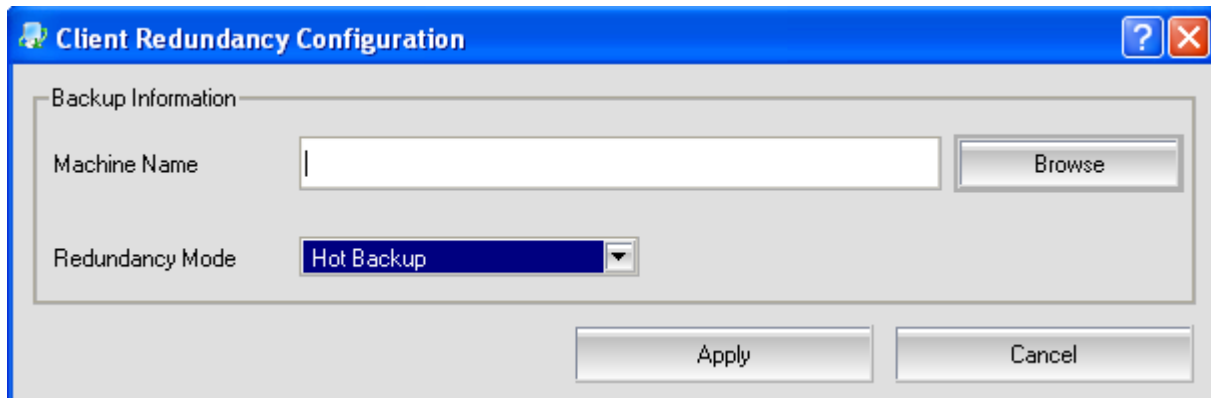


Figure 23: Client Redundancy Configuration Dialog

2. Enter the backup machine name and the redundancy mode.
3. Click the *Apply* button.
4. Verify if the backup application is well configured by observing the generated log message.

6. E-Mail Notification

To be able to configure e-mail notification for master server/client failure, the user has to choose the 'E-mail Notification' command available in the 'Redundancy' menu.



Figure 24: E-mail Notification Command

Executing this command, you'll obtain the following dialog window allowing you to set the parameters that the application needs to send e-mail notifications when a master server or the master client fails.

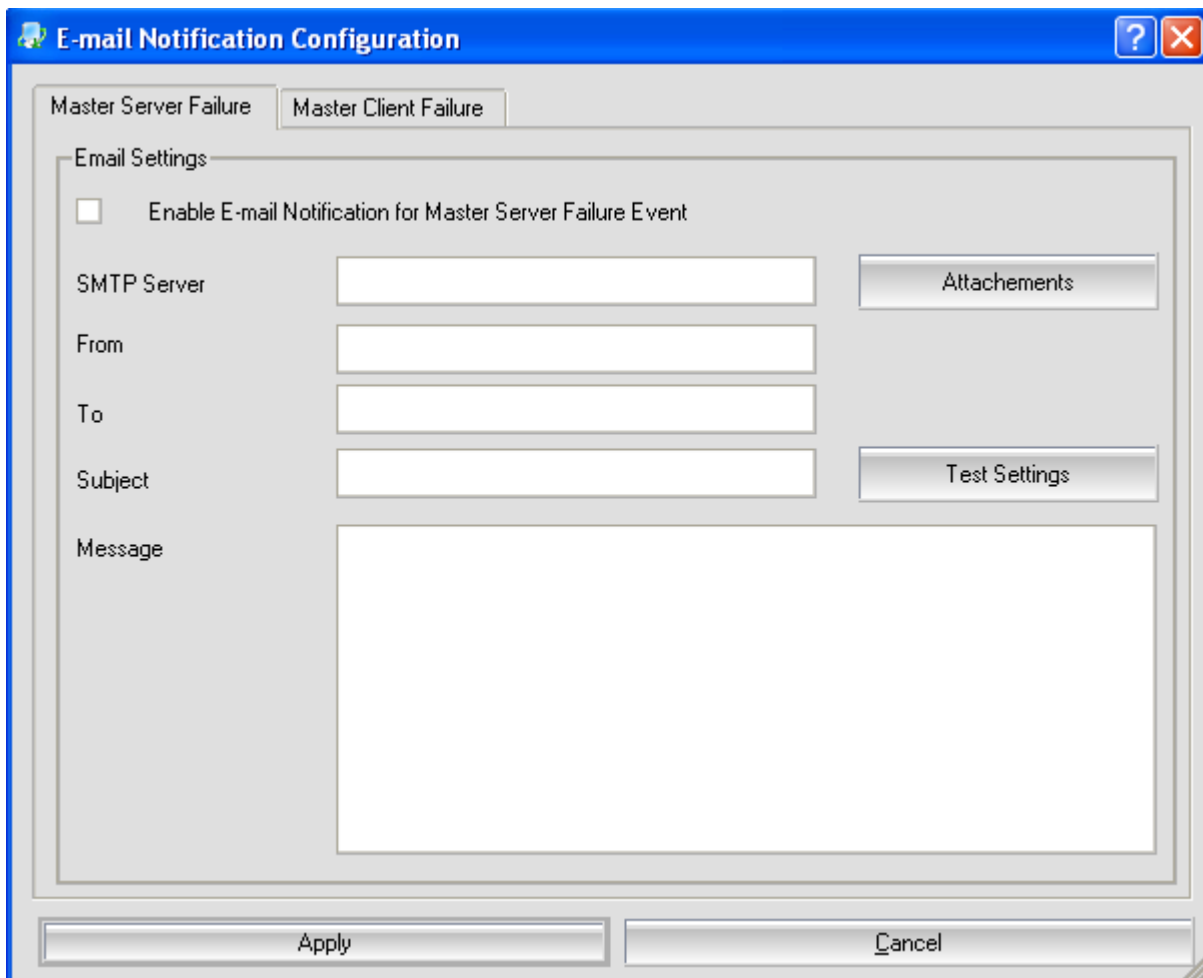


Figure 25: E-mail Notification Configuration Dialog

7. Log Event Capabilities

OPC Data Transfer provides quite extensive error tracking and management tools thus offering the end-user many ways to monitor his application in real time.

In fact, OPC Data Transfer generates 3 types of logs allowing the end-user to supervise the whole application:

- **Data Transfer Configuration Tool Logs:** These log messages are displayed on the user interface and can be exported to a text file.
- **Data Transfer COM Component Logs:** These log messages are stored in the fast database '*DataTransferLogging.fdb*' located in the Data Transfer installation directory. This file can be opened by the Log Viewer tool provided with the application.
- **OPC Client Library Logs:** These log messages are stored in the '*OPCDAClientDK-LogEvent.LOG*' text file located in the Data Transfer installation directory.

Moreover, the end-user can choose between six available log levels, shown in the settings configuration display window:

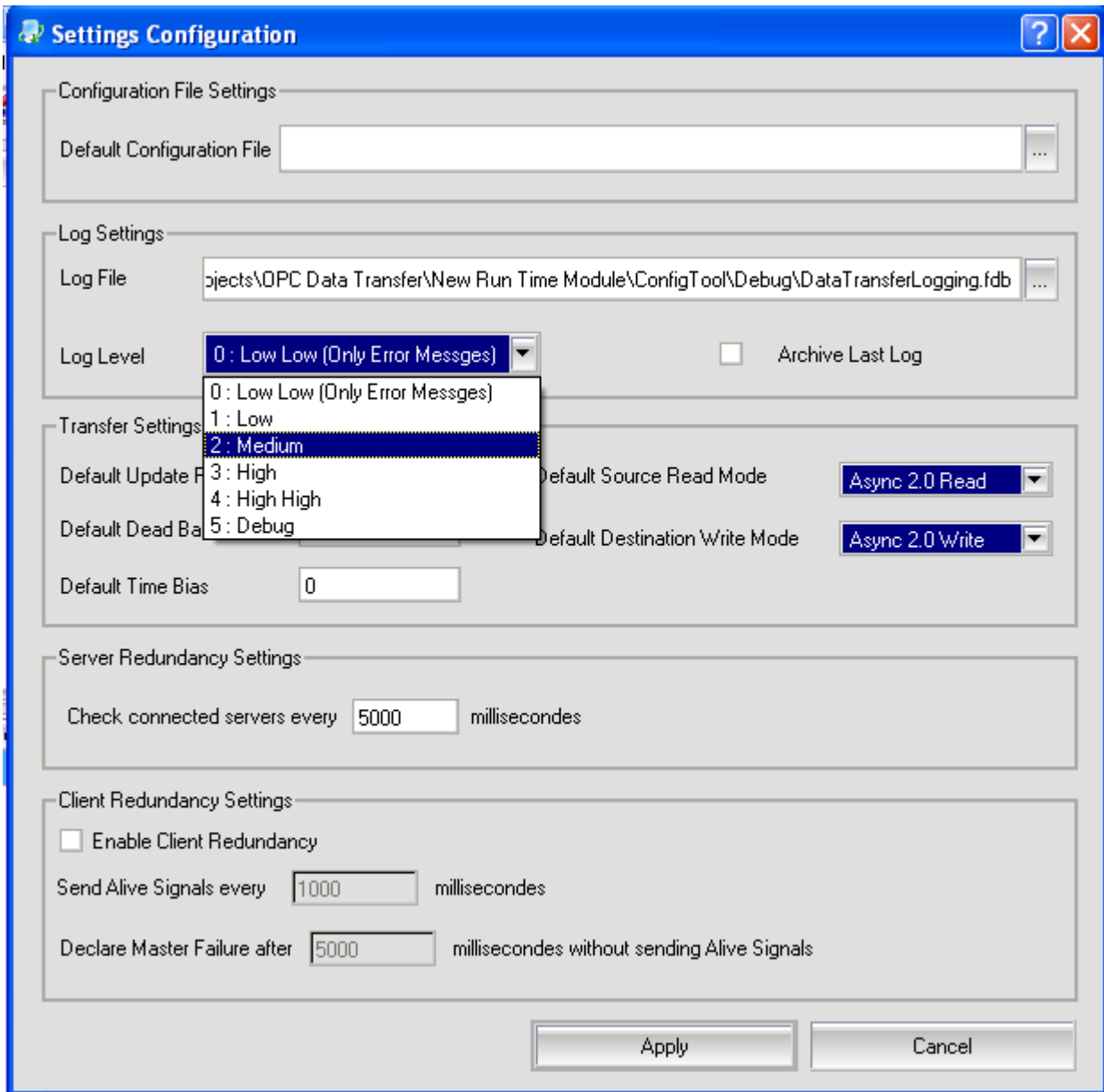


Figure 26: Log Levels

These log levels are:

- Low Low (0): This level will store only error log messages and initialization messages.
- Low (1): This level will store initialization, error and some warning messages.
- Medium (2): The medium level will store initialization, error and all warning messages.
- High (3): The high level will store initialization, error, warning and some information messages.

- High High (4): This level will store initialization, error, warning and more information messages.
- Debug (5): The debug level will store all log messages. It's used only to debug possibly encountered problems.

USER INTERFACE

In this section, we will describe and detail all the actions available at the OPC Data Transfer user interface.

1. User Interface Overview

Since the main functionality of OPC Data Transfer is data bridging between OPC servers, we'll always have 2 main server actors:

- The server from which the data will be read, which will be called the source server;
- And the server to which the data will be written, which will be called the destination server.

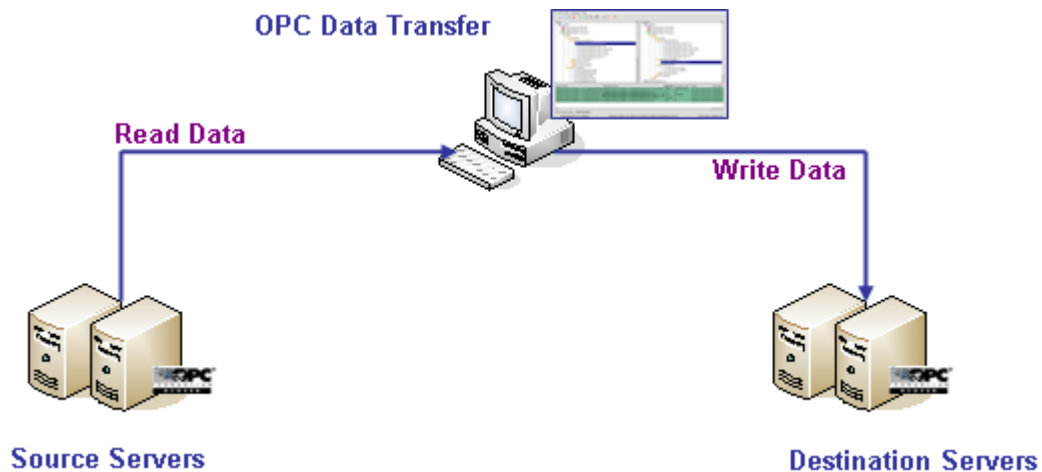


Figure 27: OPC Data Bridging

The user Interface of the OPC Data Transfer was designed taking into account this principle, so it contains 4 main parts:

- Source: This part is a browser displaying local and remote OPC servers which could be source data servers.
- Destination: This part is a browser displaying local and remote OPC servers which could be destination data servers.
- Data Transfer Display: In this table, the user can monitor configured transferred data. It contains information such as source tag, destination tag, transferred value, quality, time stamp...

- HMI Log Event: As shown in Figure 23, this table displays log messages of all configuration operations.

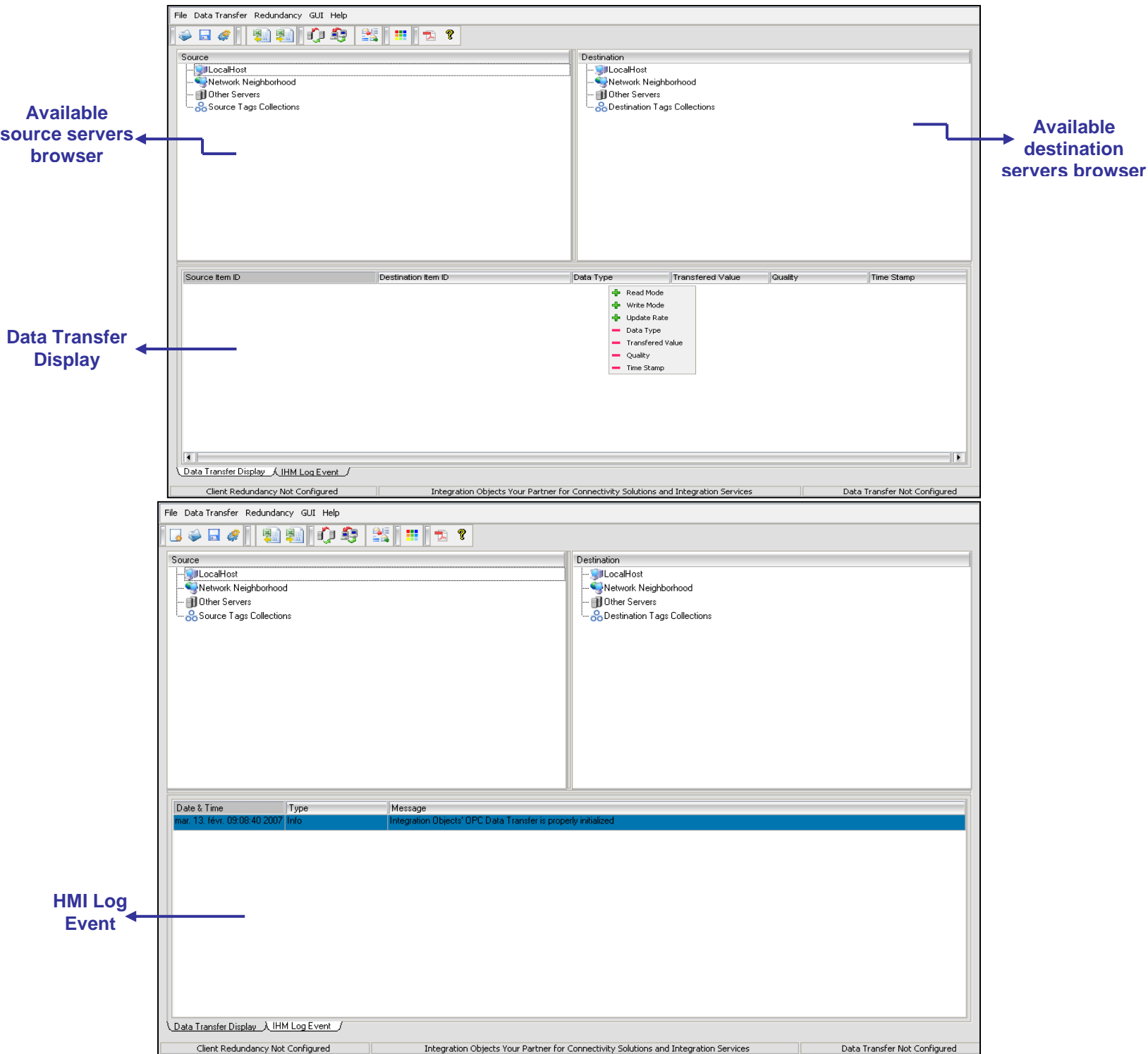


Figure 28: OPC Data Transfer User Interface

Besides these four main parts, the main interface contains a menu bar, a tool bar and a status bar.

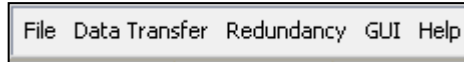


Figure 29: Menu bar



Figure 30: Tool bar

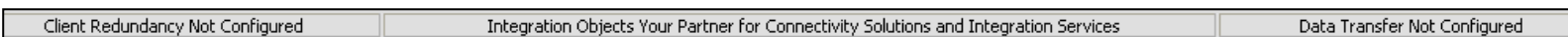


Figure 31: Status bar

2. Session Management

This section describes how to manage an OPC Data Transfer session and all the actions available in the 'File' menu located in the menu bar.

2.1. Creating A New Session

Once the OPC Data Transfer is launched, a new session is created. If you want to create a new session, you have to click on:

- The **File**→**New** menu in the Menu Bar.
- Or the **New** button in the Toolbar.

At this stage, an empty session will be created and all grayed functions will be enabled.

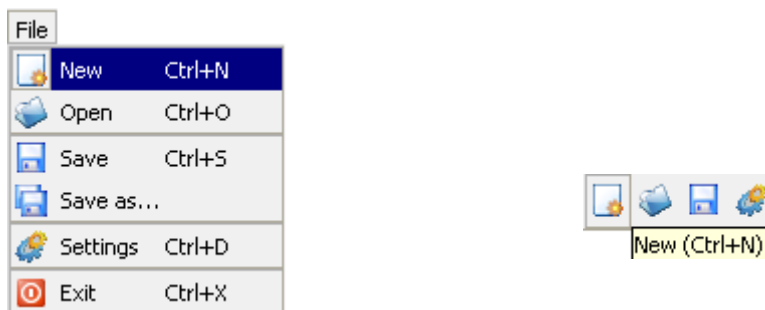


Figure 32: Creating a new session

2.2. Opening An Existing Session

To open an existing session, you click on:

- The **File**→**Open** menu in the Menu Bar.
- Or the **Open** button in the Toolbar.

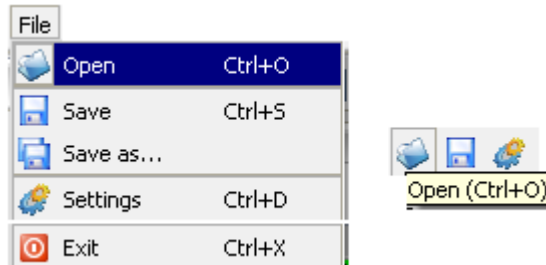


Figure 33: Opening an existing configuration

A similar dialog will be displayed in order to choose the xml file to open:

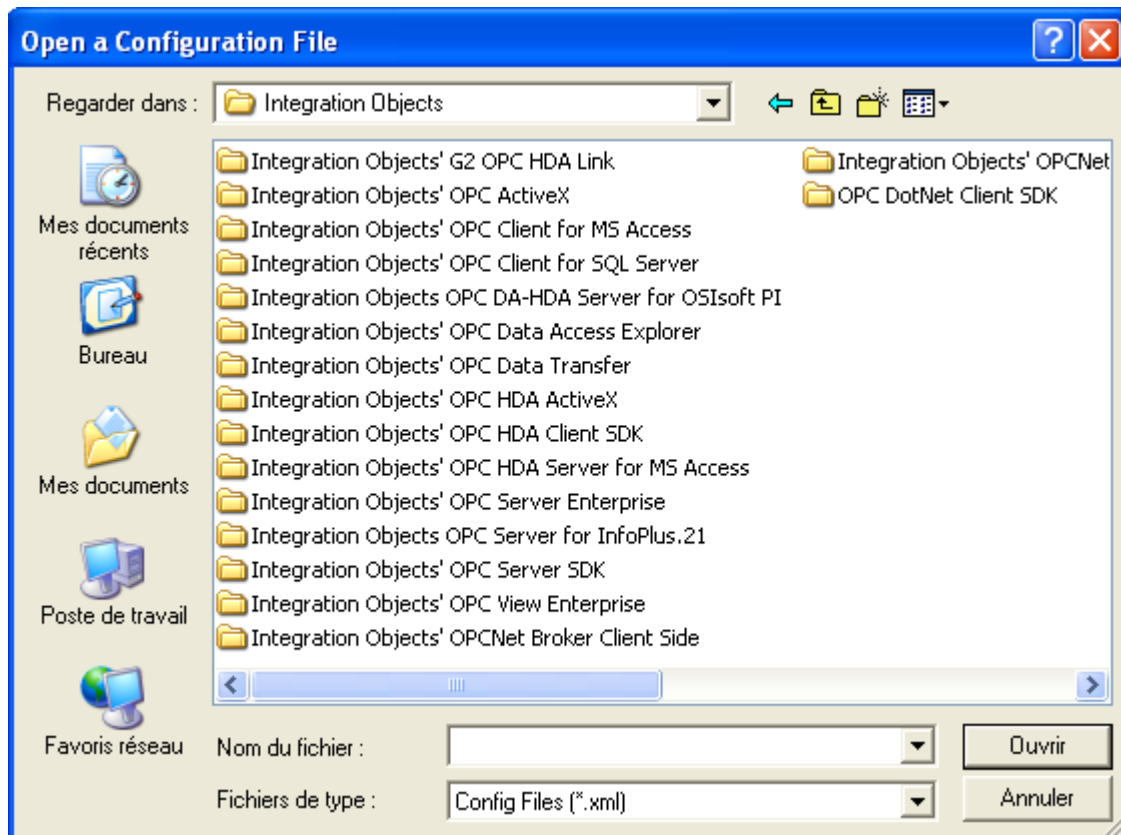


Figure 34: Opening an XML configuration file

When you choose the desired file, the OPC Data Transfer loads the related configuration and the user interface title bar will display the path of the input XML file.

2.3. Saving A Session

To save your current configuration in the OPC Data Transfer into an XML file, you can click on:

- The **File**→**Save** menu in the Menu Bar.
- Or the **Save** button in the Toolbar.

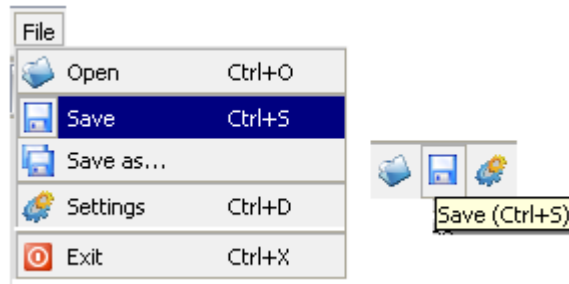


Figure 35: Saving the current configuration into an XML file

You can also use the **Save as** action. In both cases, the following dialog will be displayed in order to choose the XML file where your configuration will be saved.

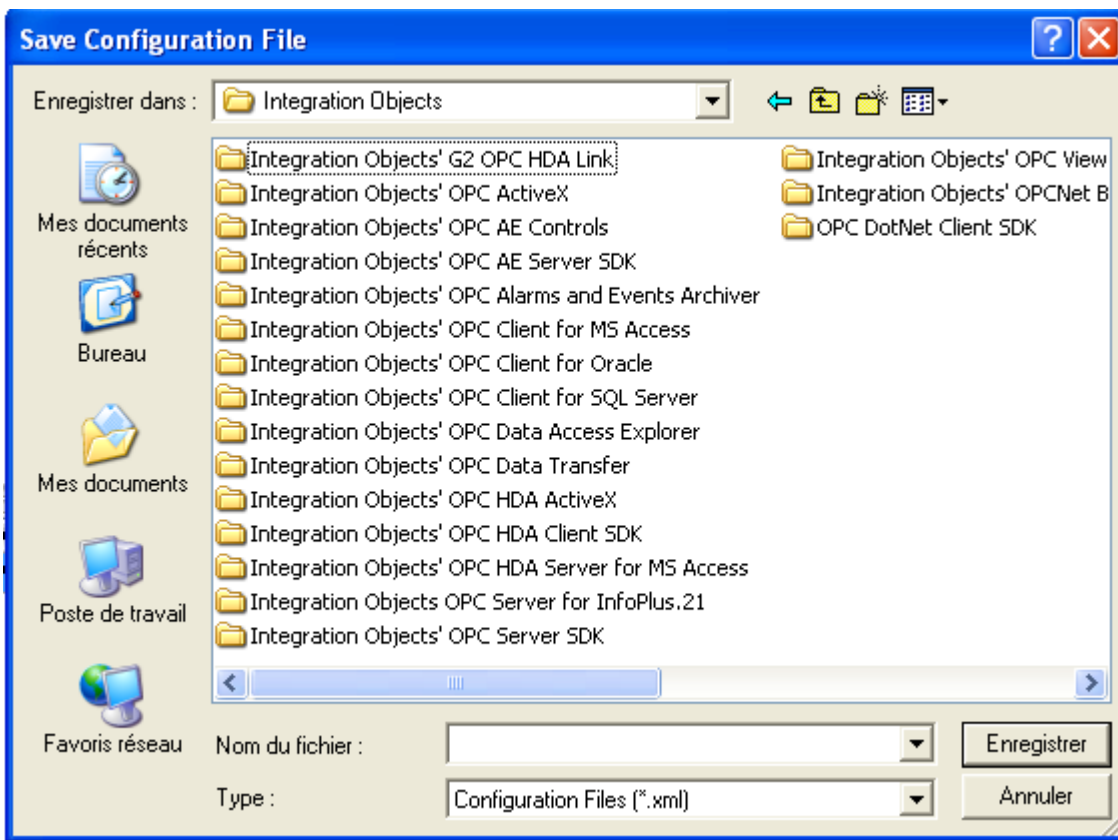


Figure 36: Saving an XML configuration file

2.4. Settings Configuration

To configure application settings, you can click the *Settings* action located in the file menu or in the toolbar or press Ctrl+D on the keyboard, as shown in the figure below:

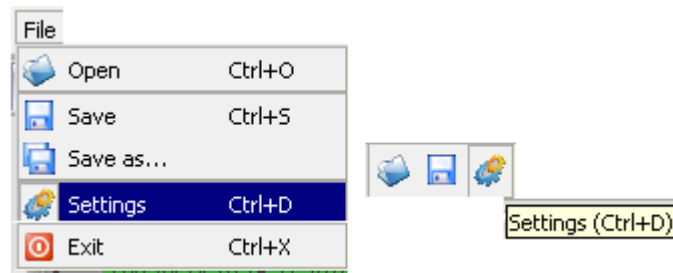


Figure 37: Settings Configuration

Figure 33 displays the dialog window allowing you to configure the application settings which includes the configuration file settings, log settings, transfer settings, server redundancy settings and client redundancy settings.

You can also configure the application settings by directly modifying the 'Settings.ini' file located in the application installation directory.

The following table gives a brief description of each parameter:

Parameter	Description [Default value]
Configuration File Settings: [DefaultConfigurationFile]	
Enabled	TRUE to enable using an XML configuration file at the application start-up and FALSE to disable this option. [FALSE]
Path	The path of the default XML/XLS configuration file which is automatically loaded at the start-up of the application. [0]
Log Settings: [Logging]	
FDB	TRUE to enable using a fast database log file and FALSE to disable this option and use a standard text file. [FALSE]
DataBasePath	The path of the FDB log file. [installation path\DataTransferLogging.fdb]
LogLevel	Level of the log file. [0]
ArchiveLastLog	TRUE in order to save log messages from previous sessions and FALSE otherwise. [FALSE]
LogFileMaxSize	Maximum size for the text log file

	[2097152]
Transfer Settings: [Transfer]	
DFLTRATE	Update rate of source groups used by default. [1000]
DFLTTIMEBIA	Dead band of OPC groups used by default. [0]
DFLTDEADBAND	Time bias of OPC groups used by default. [0]
DFLTSOURCEREAD	Read mode of source groups used by default. [0]
DFLTDESTWRITE	Write mode of destination groups used by default. [4]
Server Redundancy Settings: [ServerRedundancy]	
CheckingPeriod	The application will check the state of all connected server each checking period. [5000]
Client Redundancy Settings: [ClientRedundancy]	
Enabled	TRUE to enable client redundancy and FALSE to disable client redundancy. [FALSE]
IsMaster	TRUE if the application is running in the master node and FALSE otherwise. [TRUE]
MasterNode	The hostname of the machine where the master client is running. [HOST]
Timeout	The master/backup application will be declared failed after a failure period of no live signals being sent. This failure period is equal to the value of the Timeout parameter. [5000]
SendAlive	The master and the backup application will exchange ping signals every live period. This live period is equal to the value of the SendAlive parameter. [1000]

Mode	The backup client redundancy mode. If its value is 1, the backup client is a hot backup. If it's 2, the backup is a warm backup. [1]
------	--

Table 2: Configuration Parameters

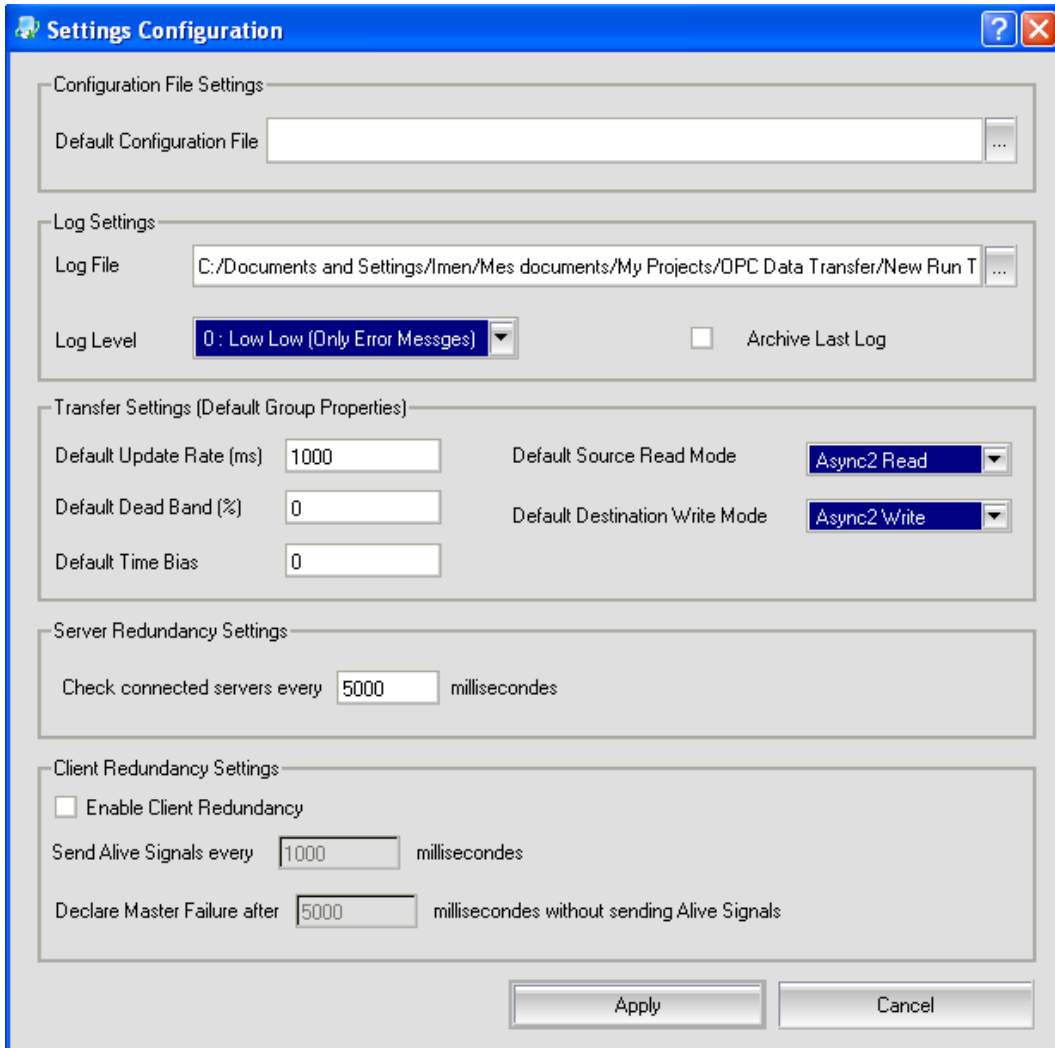


Figure 38: Settings Configuration Dialog

2.5. Shutting Down The Application

In order to exit the application:

- Click the **File→Exit** option in the Menu Bar.
- Or press Ctrl+X using the keyboard.

If you have a data transfer configuration running, you'll obtain a confirmation dialog saying that the application would proceed to a complete shutdown.

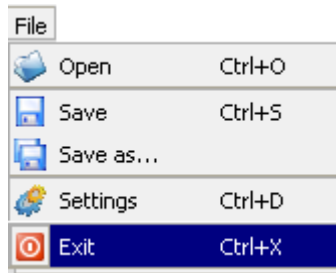


Figure 41: Exiting OPC Data Transfer

3. Data Transfer

A transfer operation is a mapping between two OPC items. So, in order to create a transfer operation, we need to associate two OPC items. The OPC Data Transfer user interface facilitates this mapping by using a drag & drop mechanism. The end-user can create his transfer operations one at a time by using the one to one mapping or all at the same time by using the many to many mapping.

3.1. One To One Mapping

To associate one source tag to one destination tag, the user has simply to drag the source tag from the source browser and to drop it into to the destination tag located in the destination browser.

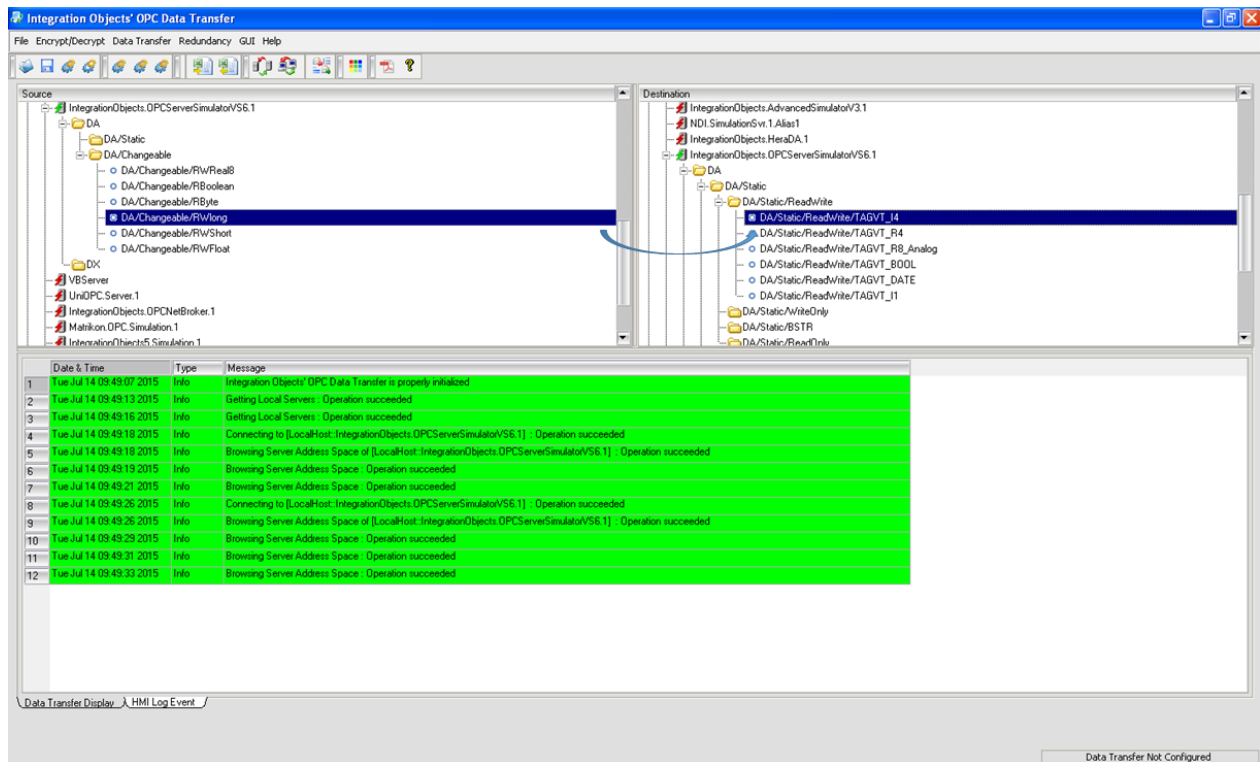


Figure 42: One to One Mapping



When creating a transfer operation, be sure that the OPC destination items are not read-only items and that the OPC source item is not a write-only item.

Once the mapping is made, the user will receive the following confirmation dialog window:

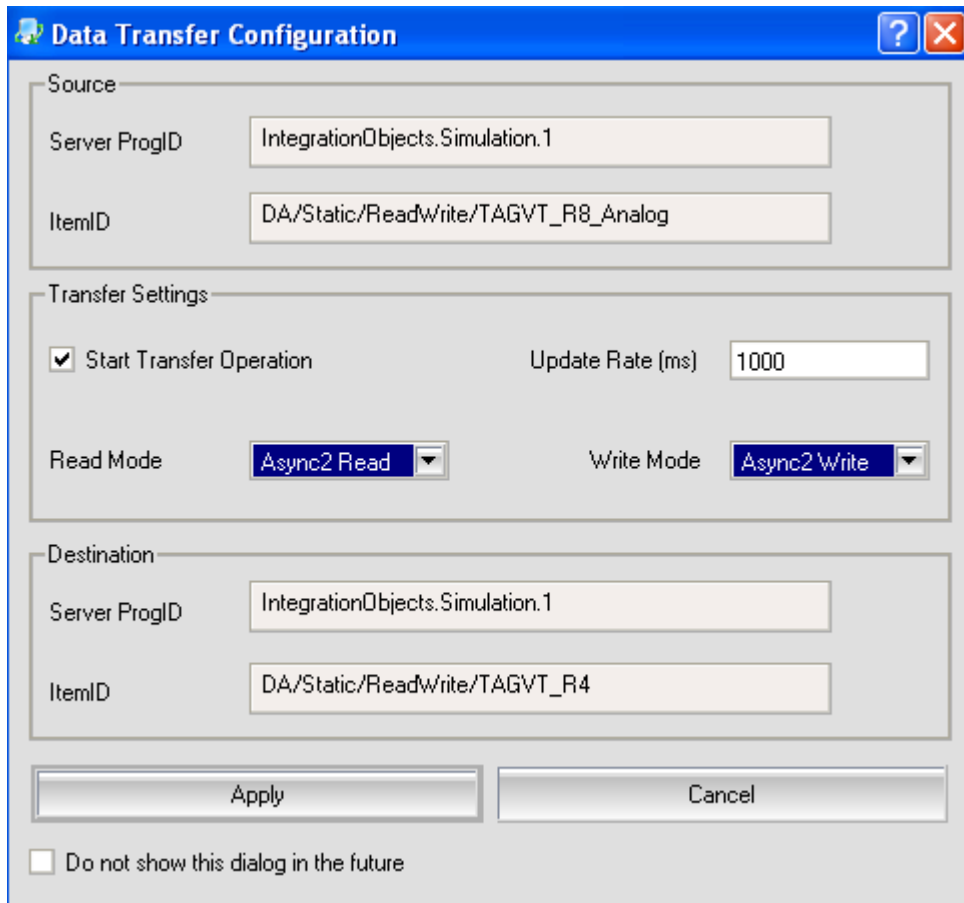


Figure 43: Transfer Configuration Confirmation Dialog

- **Source:**
 - Server ProgID: Source Server ProgID,
 - ItemID: Source Item ID

- **Transfer Settings:**
 - Start Transfer Operation: If this option is checked, the transfer will automatically start as soon as the operation is created. Otherwise, the operation will be stopped at the creation and the user will have to manually start it.

 - Update Rate: Its value (in milliseconds) determines the rate of reading data from the OPC source item.

- **Read Mode:** The read mode determines which method will be used to read data from the OPC source item. If the user chooses 'Sync Read' mode, data will be read using cache synchronous read operations through the OPC interface 'IOPCSyncIO'. If the chosen mode is 'Async 1.0a Read', source data will be collected asynchronously through a subscription via 'IAdviseSink::OnDataChange' method. When using the 'Async 2.0 Read' mode, source data will be collected asynchronously through a subscription via 'IOPCDataCallback::OnDataChange' method.
 - **Write Mode:** The write mode determines the method used to write data values in the OPC destination item. When using the 'Sync Write' mode, data values will be written using the 'IOPCSyncIO' OPC interface. The 'Async 1.0a Write' mode used the 'IOPCAsyncIO' OPC interface and the 'Async 2.0 Write' the 'IOPCAsyncIO2' OPC interface.
- **Destination:**
 - Server ProgID: Destination Server ProgID,
 - ItemID: Destination Item ID.

The 'Source' and 'Destination' fields can't be modified because the mapping is already created. If you detect an error in these fields, you can delete the mapping by clicking the *Cancel* button. To confirm the mapping, click the *Apply* button.

The user can choose not to show this confirmation dialog in the future by checking the option '*Do not show this dialog in the future*' available at the bottom of the dialog. In this case, the transfer settings used will be the default settings stated in the settings file (Refer to the settings configuration section).

3.2. Many To Many Mapping

The many to many mapping also uses the drag and drop mechanism but, before using it, the user needs to create source and destination tag collections.

A tag collection is a set of OPC items, designed to facilitate the mapping between many OPC items. In fact, after creating source and destination tag collections, a many to many mapping will be a mapping between a source and a destination collection.

In order to create a source collection, the user has to double click the *Source Tags Collections* which is available in the source browser. Once this action is executed, a source collection configuration dialog will be displayed.

To be able to add source OPC items into the source collection, just drag these items from the source browser and drop them to the 'Source items' table located in the source collection configuration dialog (See Figure 37). Follow the same steps to create a destination tags collection (See Figure 38).

The chosen items don't need to belong to the same OPC server.

Once the user clicks the *Apply* button of the collection configuration dialog, a sub item will be created under the 'Source/Destination Tags Collections' item.

Now, to create a many to many mapping, the user simply has to drag the source collection from the source browser and drop it into the destination collection located in the destination browser, as shown in Figure 39.

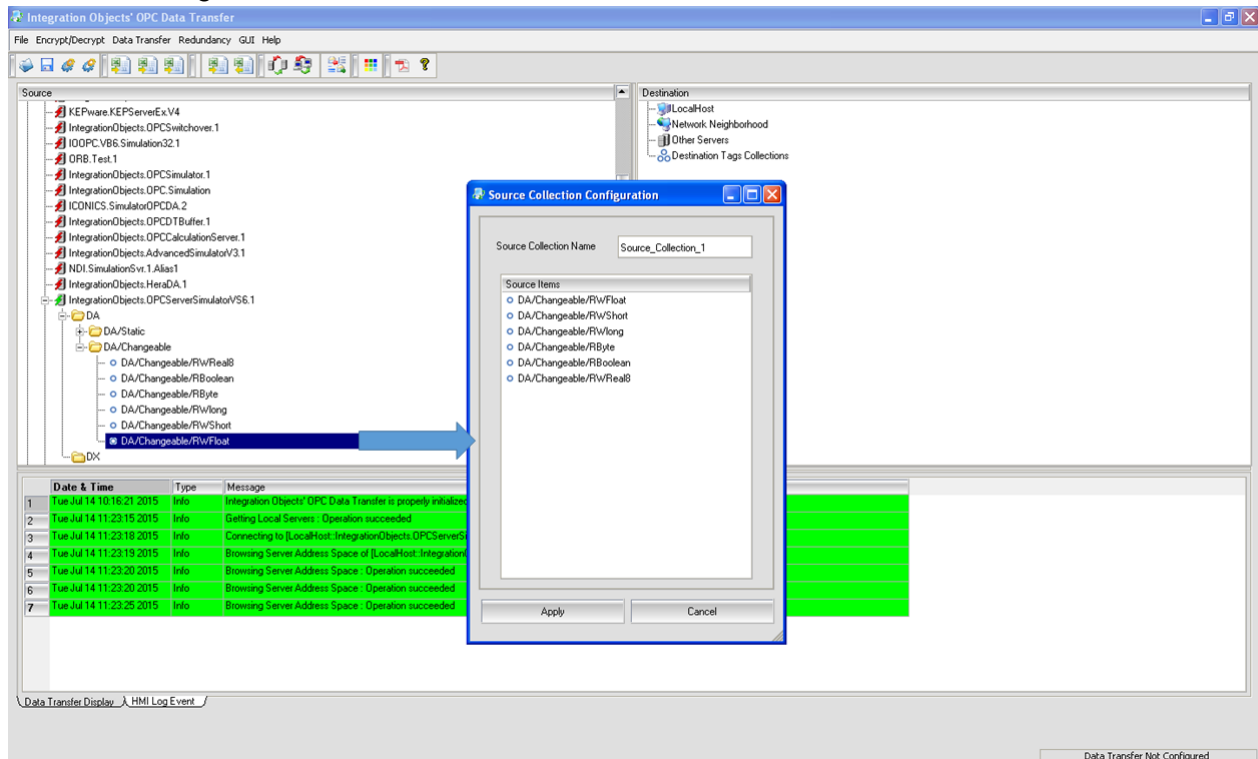


Figure 44: Creating a source tags collection

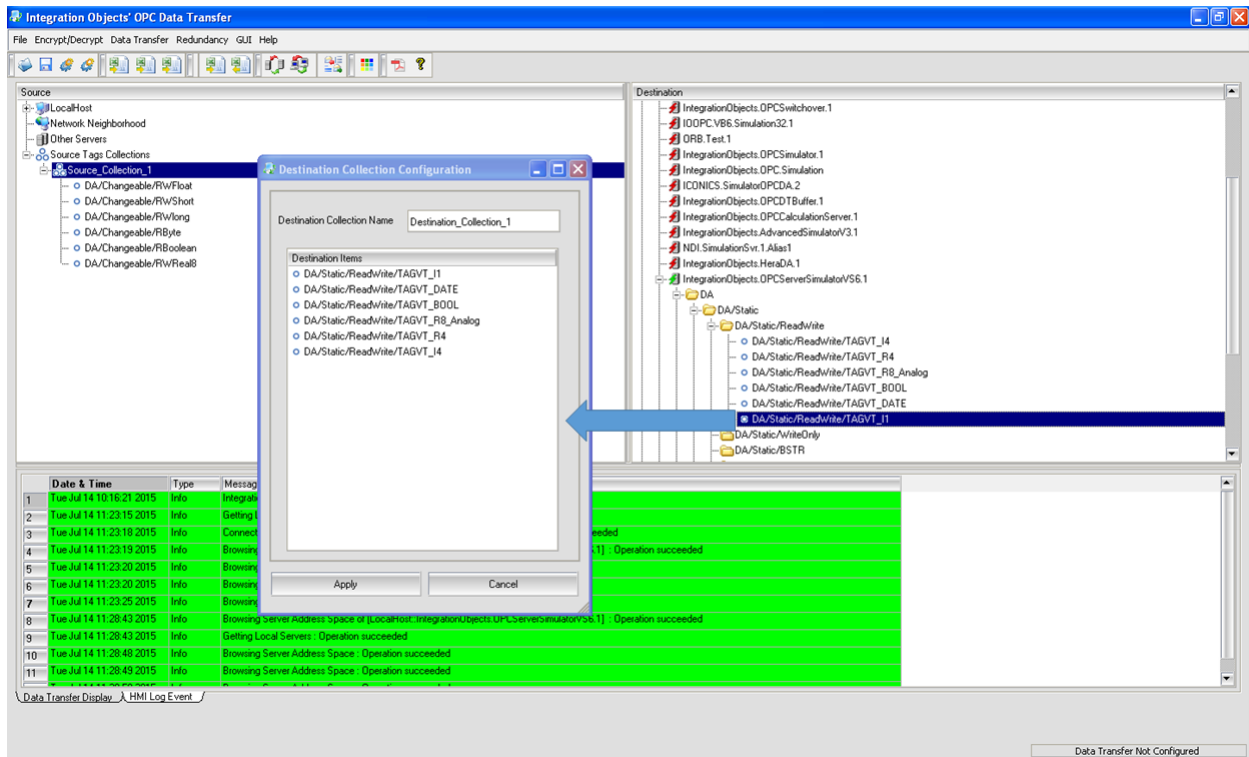


Figure 45: Creating a destination tags collection

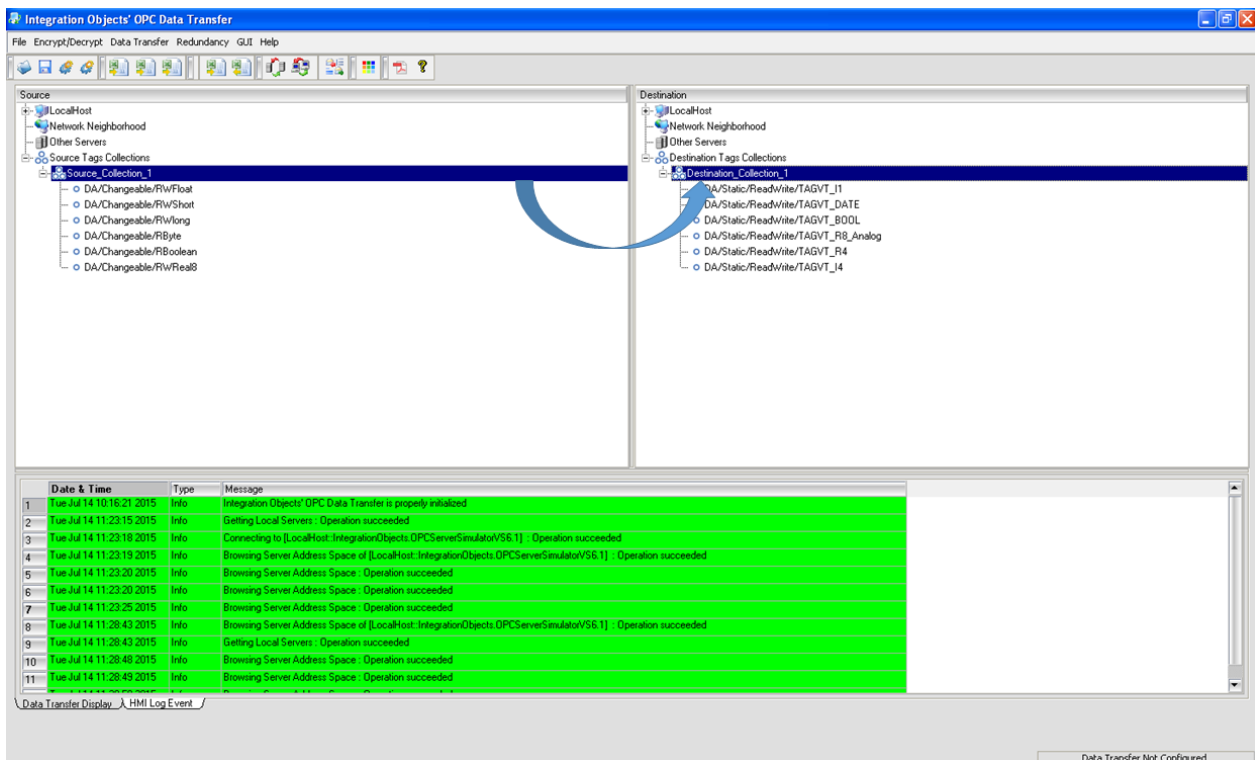


Figure 46: Many to Many Mapping

After the drag & drop of the collections, the user will receive a confirmation dialog window in order to configure, verify and rearrange the created many to many mapping. The dialog window looks like the figure below:

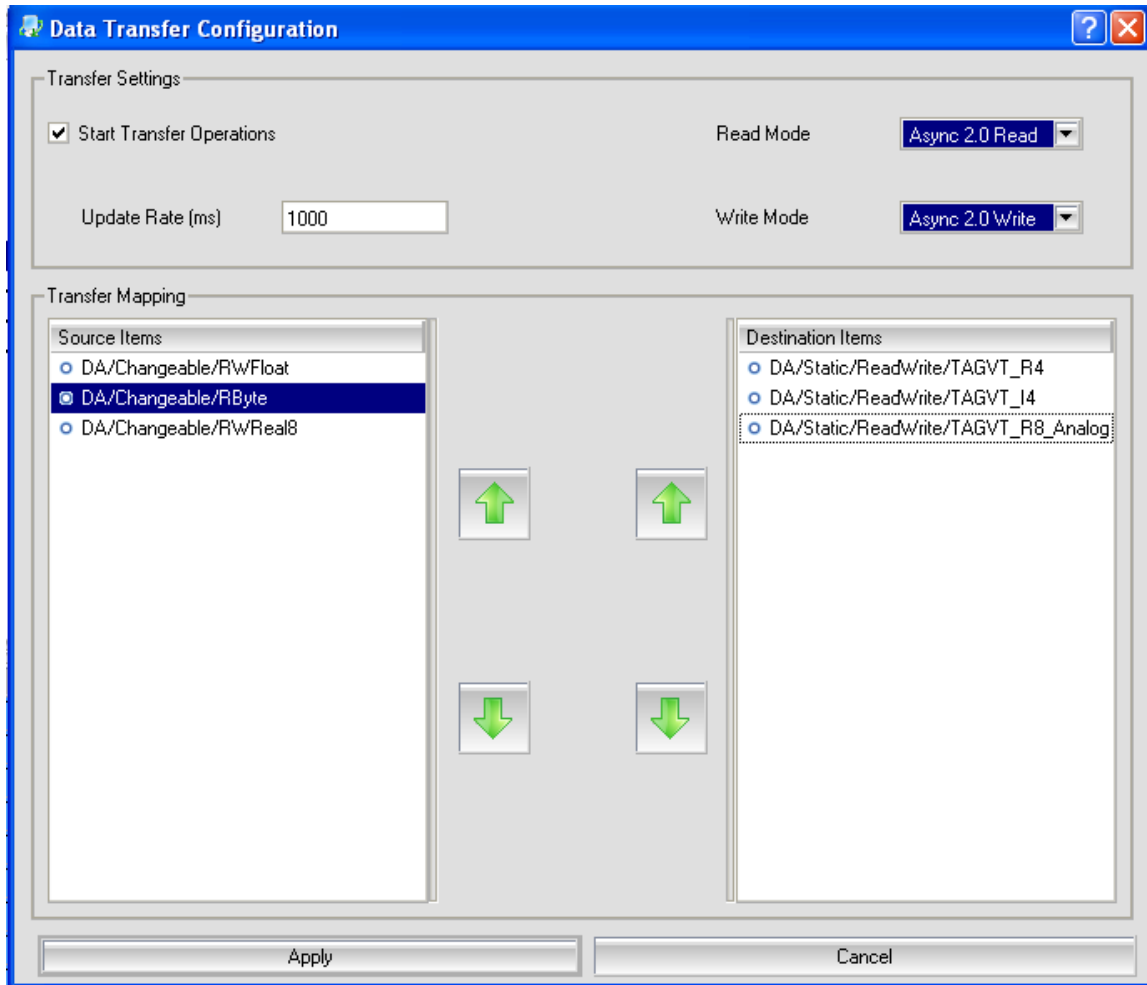


Figure 47: Many to Many Mapping Configuration

- **Transfer Settings:**

- **Start Transfer Operations:** When this option is checked, the transfer will automatically start as soon as the operations are created. Otherwise, the operations will be stopped at the creation and the user will have to manually start them.
- **Update Rate:** Its value (in milliseconds) determines the rate of reading data from the OPC source items.
- **Read Mode:** The read mode determines which method will be used to read data from the OPC source items. If the user chooses 'Sync Read' mode, data will be read using cache synchronous read operations through the OPC interface 'IOPCSyncIO'. If the chosen mode is 'Async 1.0a Read', source data will be collected asynchronously through a subscription via 'IAdviseSink::OnDataChange' method. When using the 'Async 2.0 Read' mode,

source data will be collected asynchronously through a subscription via *'IOPCDataCallback::OnDataChange'* method.

- Write Mode: The write mode determines the method used to write data values in the OPC destination items. When using the 'Sync Write' mode, data values will be written using the *'IOPCSyncIO'* OPC interface. The 'Async 1.0a Write' mode used the *'IOPCAsyncIO'* OPC interface and the 'Async 2.0 Write' the *'IOPCAsyncIO2'* OPC interface.
- **Transfer Mapping:**
 - For each source item, the associated destination item is located at the same line level as the source item. Using the arrows, the user can rearrange the source and destination item tables in order to have the right mapping.
 - The user can also delete items from the tables by selecting the requested item and pressing the 'delete' key.

The end-user can also rename an existing tags collection, add an OPC item to an existing collection, remove an item from a tag collection and even remove an entire tag collection. These operations are available when you right-click on the collection item.

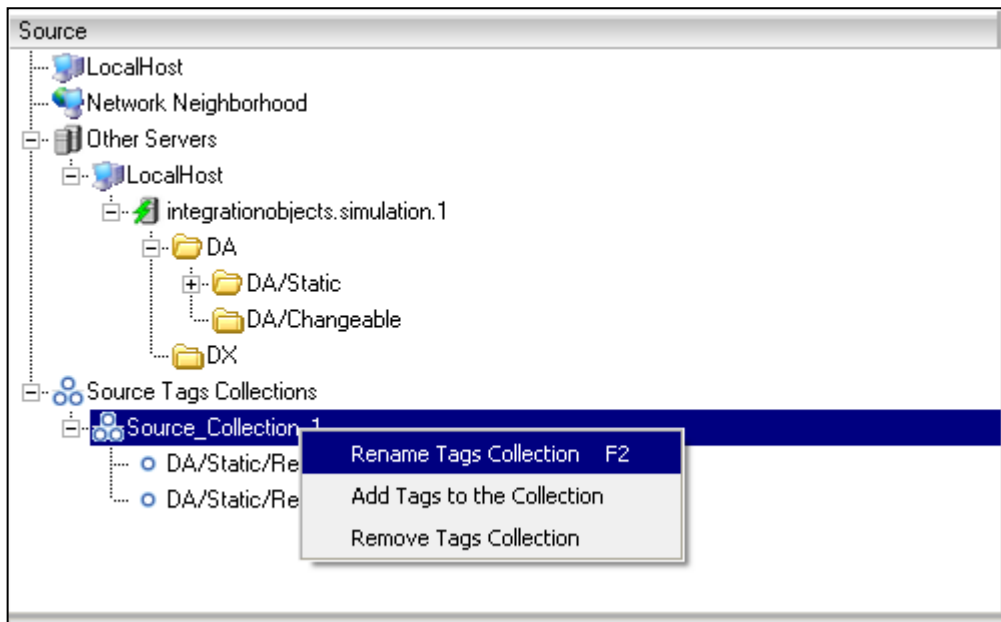


Figure 48: Collection Contextual Menu

3.3. One To Many Mapping

The Data Transfer user interface allows the user to also create a one to many mapping. To do so, the user has to create a source collection composed of one OPC source item and a destination collection containing all the destination OPC items that will be associated to the requested OPC source item. The user will proceed with dragging the source collection and

dropping it in the corresponding destination collection. Once the confirmation dialog box is displayed, just duplicate the source OPC item, as shown in the figure below, in order to have the same number of items as the destination collection:

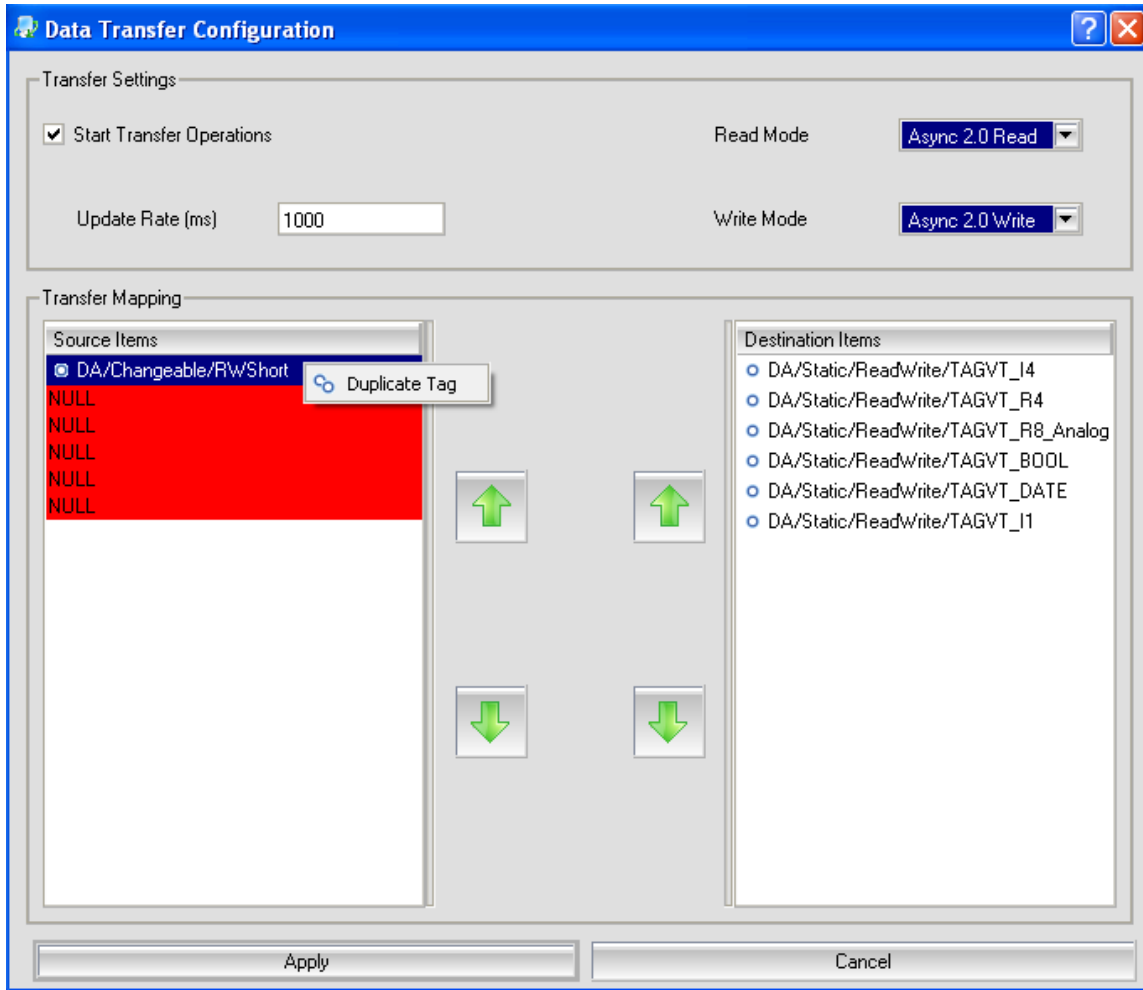


Figure 49: Duplicate a source OPC item



The NULL items are present to warn that the number of source items does not correspond to the number of destination items. In fact, a many to many mapping must have the same number of source items as of destination items.

3.4. Data Transfer Display

Once the mapping (one to one, many to many or one to many) is confirmed, the requested transfer operations are created. Each operation is displayed as a row in the data transfer display table.

By default, this table is composed of the following columns:

- **Source item ID:** this column displays the source server progID and the source OPC item ID.
- **Destination Item ID:** this column displays the destination server progID and the destination OPC item ID.
- **Data Type:** It indicates the source data type.
- **Transferred Value:** It indicates the data value transferred from the source OPC item to the destination OPC item.
- **Quality:** It indicates the source data quality.
- **Time Stamp:** It indicates the source data time stamp.

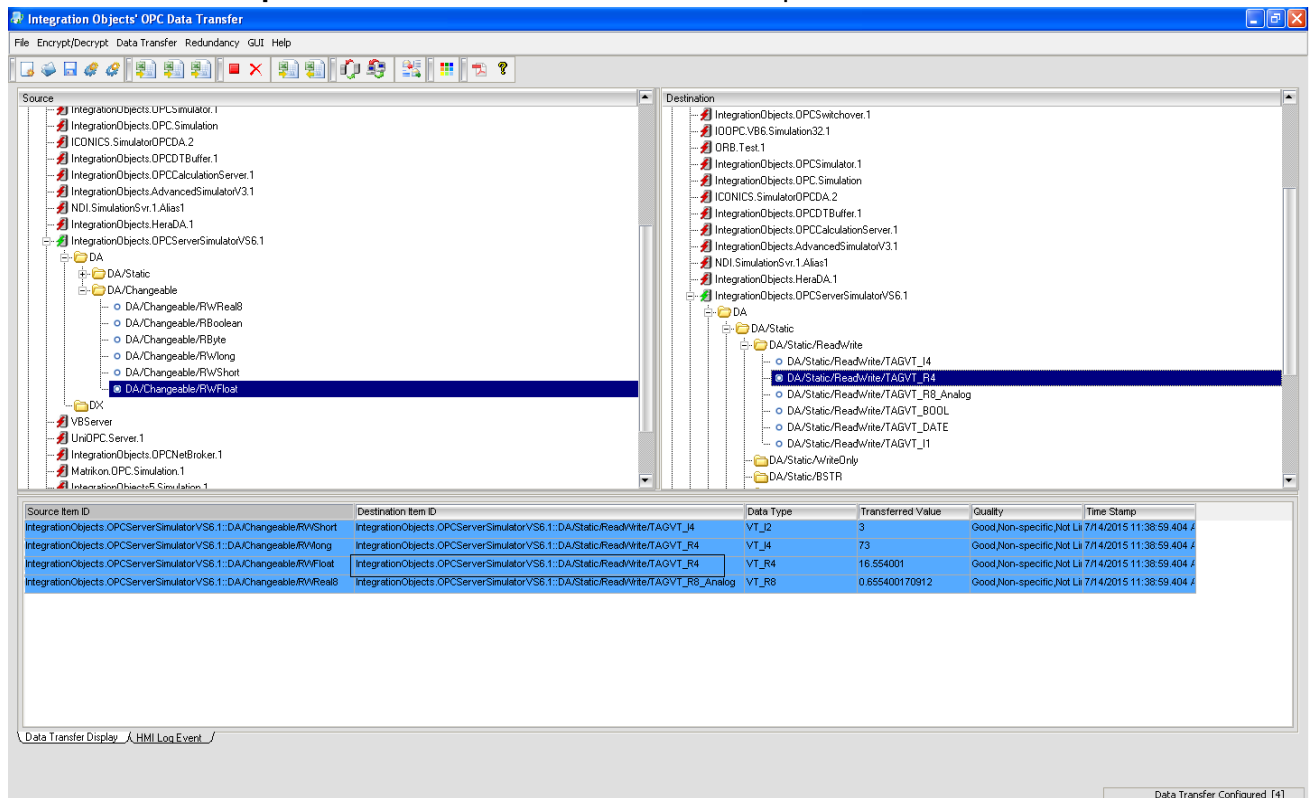


Figure 50: Data Transfer Display

By left-clicking on the table header, a contextual menu will be displayed allowing the end-user to add/remove columns to the transfer display table (see figure below).

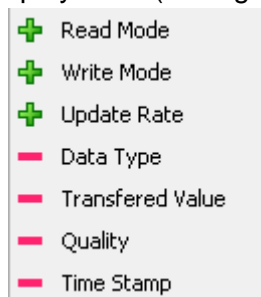


Figure 51: Data Transfer Display Table Menu

By default, the following columns are hidden but can be displayed upon user request:

- **Read Mode:** indicates the mode used to read data from the corresponding source OPC item.
- **Write Mode:** indicates the mode used to write data to the corresponding destination OPC item.
- **Update Rate:** indicates the frequency that data is read from the corresponding source OPC item.

These parameters can be edited directly from the data transfer display table.

Source Item ID	Destination Item ID	Write Mode	Data Type	Transferred Value	Quality	Time Stamp
IntegrationObjects.Simulation.1::DA/Changeable/Rv	IntegrationObjects.Simulation.1::DA/Static/Read/Wri	Async 2.0 Write	VT_R8	0.771753346820	Good,Non-specific	09/05/2007 15:27:20.2
IntegrationObjects.Simulation.1::DA/Changeable/Rv	IntegrationObjects.Simulation.1::DA/Static/Read/Wri	Sync Write	VT_I2	1	Good,Non-specific	09/05/2007 15:22:11.2
		Async 1.0a Write				
		Async 2.0 Write				

Figure 52: Editing the write mode of a transfer operation

The end-user can also stop/run/remove a transfer operation from the transfer display by right-clicking on the requested operation.

Source Item ID	Destination Item ID	Data Type	Transferred Value	Quality	Time Stamp
IntegrationObjects.Simulation.1::DA/Changeable/Rv	IntegrationObjects.Simulation.1::DA/Static/Read/Wri	VT_R8	0.722223944772	Good,Non-specific,Not Li	09/05/2007 15:24:46.453
IntegrationObjects.Simulation.1::DA/Changeable/Rv	IntegrationObjects.Simulation.1::DA/Static/			Good,Non-specific,Not Li	09/05/2007 15:22:11.203
		Stop this Transfer Operation			
		Remove this Transfer Operation			

Source Item ID	Destination Item ID	Data Type	Transferred Value	Quality	Time Stamp
IntegrationObjects.Simulation.1::DA/Changeable/Rv	IntegrationObjects.Simulation.1::DA/Static/Read/Wri	VT_R8	0.870323035258	Good,Non-specific,Not Li	09/05/2007 15:24:05.750
IntegrationObjects.Simulation.1::DA/Changeable/Rv	IntegrationObjects.Simulation.1::DA/Static/Read/Wri	VT_I2	1	Good,Non-specific,Not Li	09/05/2007 15:22:11.203
		Run this Transfer Operation			
		Remove this Transfer Operation			

Figure 53: run/stop/remove a transfer operation

3.5. Transfer Menu

The transfer menu allows the user to:

- Run all stopped configured transfer operations;

- Stop all started configured transfer operations;
- Delete all configured transfer operations;
- Import data transfer configuration from an XLS/CSV file;
- Export current transfer configuration to an XLS/CSV file.

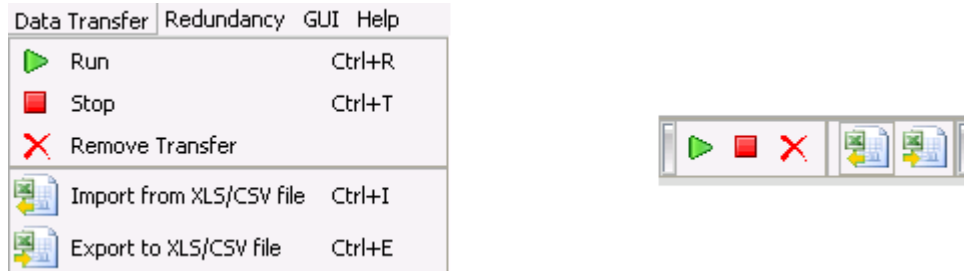


Figure 54: Transfer Menu and Tool bar

The XLS/CSV file used by the OPC data transfer application has the following format:

Source Machine	Source ProgID	Source Tag	Destination Machine	Destination Server	Destination Tag	Transfer State	Read Mode	Write Mode	Update Rate

- Source Machine: the name of the machine where the source server is running.
- Source Server: the ProgID of the source server.
- Source Tag: the item ID of the source tag.
- Destination Machine: the name of the machine where the destination server is running.
- Destination Server: the ProgID of the destination server.
- Destination Tag: the item ID of the destination tag.
- Transfer State: this indicates if the transfer operation is started (1) or stopped (0).
- Read Mode: the read mode used to read data from the source server (0 for the asynchronous mode 2.0, 1 for asynchronous mode 1.0a and 3 for synchronous mode).
- Write Mode: the write mode used to write data to the destination server (4 for the asynchronous mode 2.0, 5 for asynchronous mode 1.0a and 7 for synchronous mode).
- Update Rate: the value of the source update rate.

4. Redundancy

This section describes the actions available in the redundancy menu (see figure below).

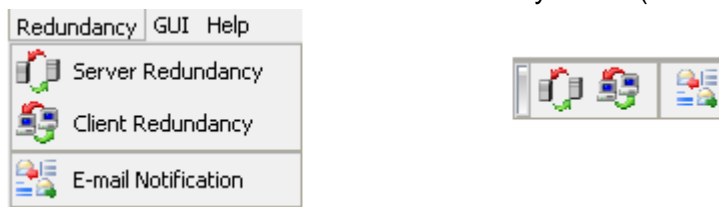


Figure 55: Redundancy Menu and Tool bar

4.1. Server Redundancy

When clicking the *Server Redundancy* action available in the redundancy menu or tool bar, the following dialog is displayed.

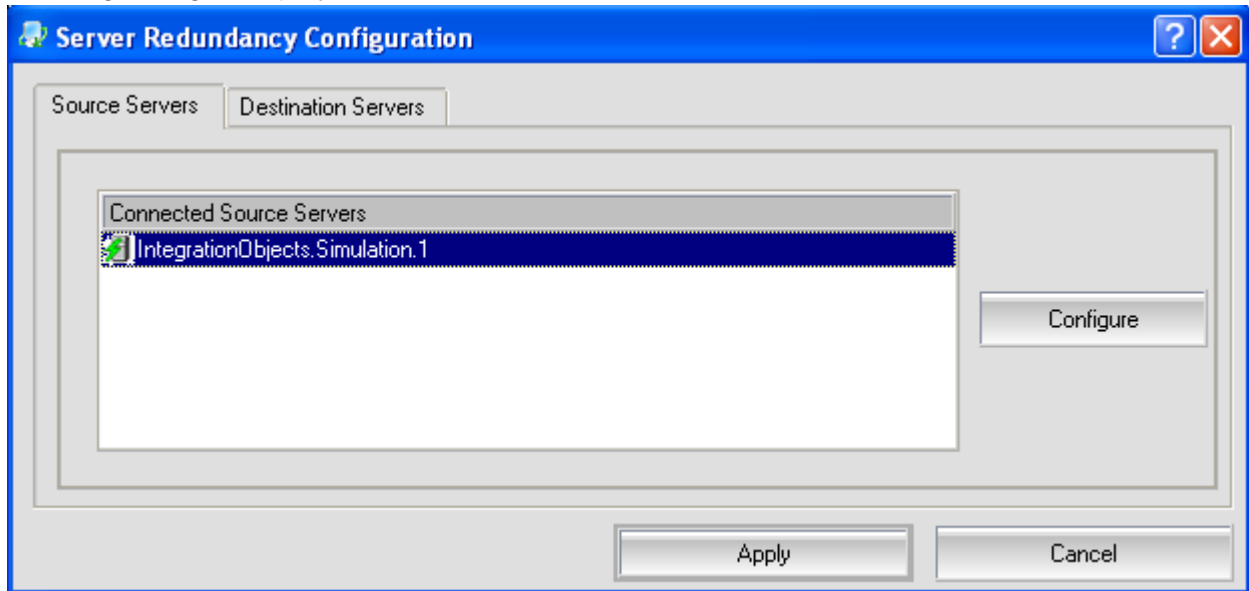


Figure 56: Server Redundancy Configuration

Once the user selects the master server from the connected source/destination servers and clicks the *Configure* button, the following dialog is displayed:

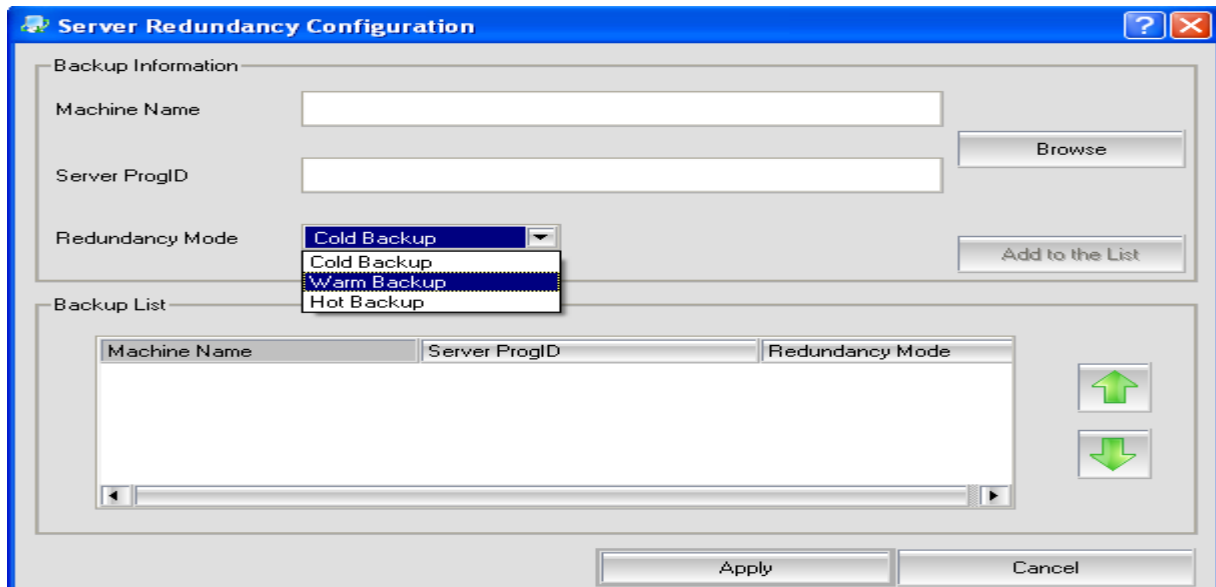


Figure 57: Server Redundancy Configuration of the selected server

To configure a backup server for the selected master server, the end-user needs to proceed to the following steps:

5. Choose a backup server:

The end-user can manually enter the backup server information (the machine hosting the backup server and the backup server progID) or can select the backup server by browsing the network using the 'Browse' button.

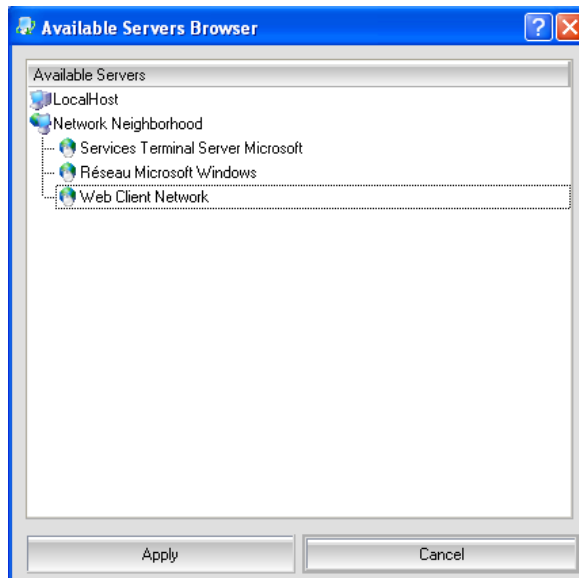


Figure 58: OPC Servers browsing

6. Choose a redundancy mode:

A backup server can have one of the 3 following redundancy modes:

- Cold Mode: The backup OPC server is not connected. When a master fail-over occurs, OPC Data Transfer automatically connects to the backup server, adds groups and items and starts to transfer the requested OPC data
- Warm Mode: The backup server is connected. When a master fail-over occurs, OPC Data Transfer automatically adds the created groups and items and starts to transfer the requested OPC data.
- Hot Mode: The backup server is connected, OPC groups are created and OPC items are added with inactive state. When a master fail-over occurs, OPC Data Transfer automatically activates OPC Items and starts to transfer the requested OPC data.

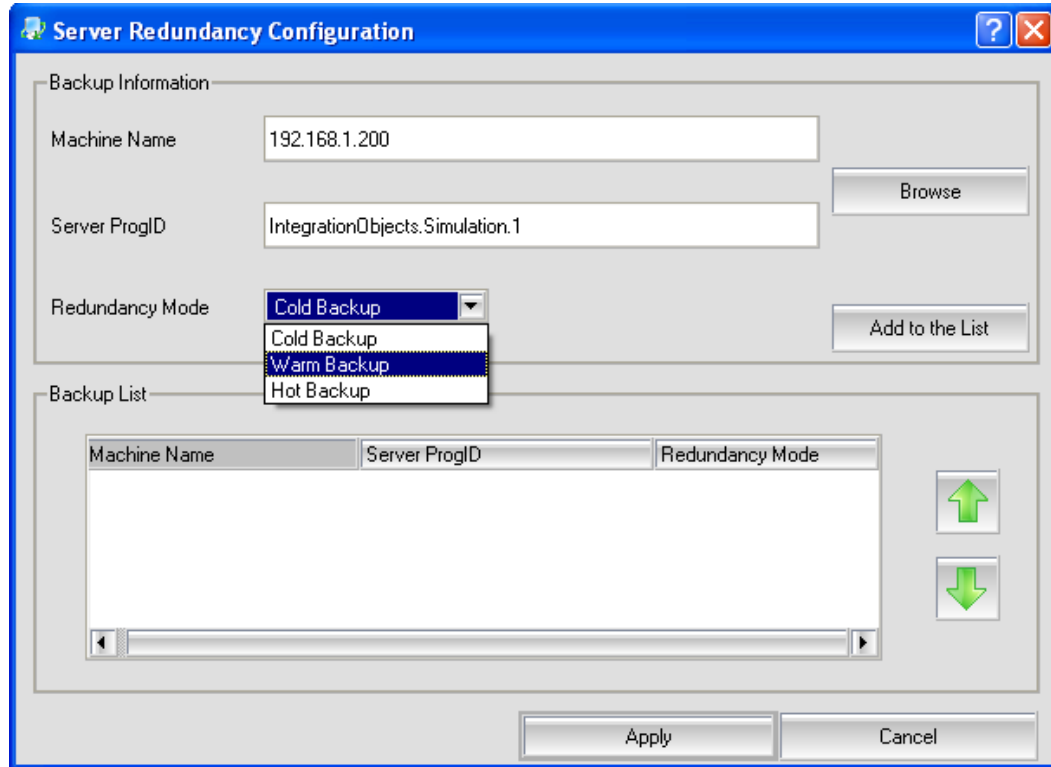


Figure 59: Backup Server Redundancy Mode

7. Confirm the input configuration:

After entering the backup machine name, the backup server ProgID and the redundancy mode, the end-user has to confirm this configuration by clicking the Add to the List button.

The user can also remove a backup server by right-clicking the line corresponding to the backup server and selecting the delete action (see figure below).

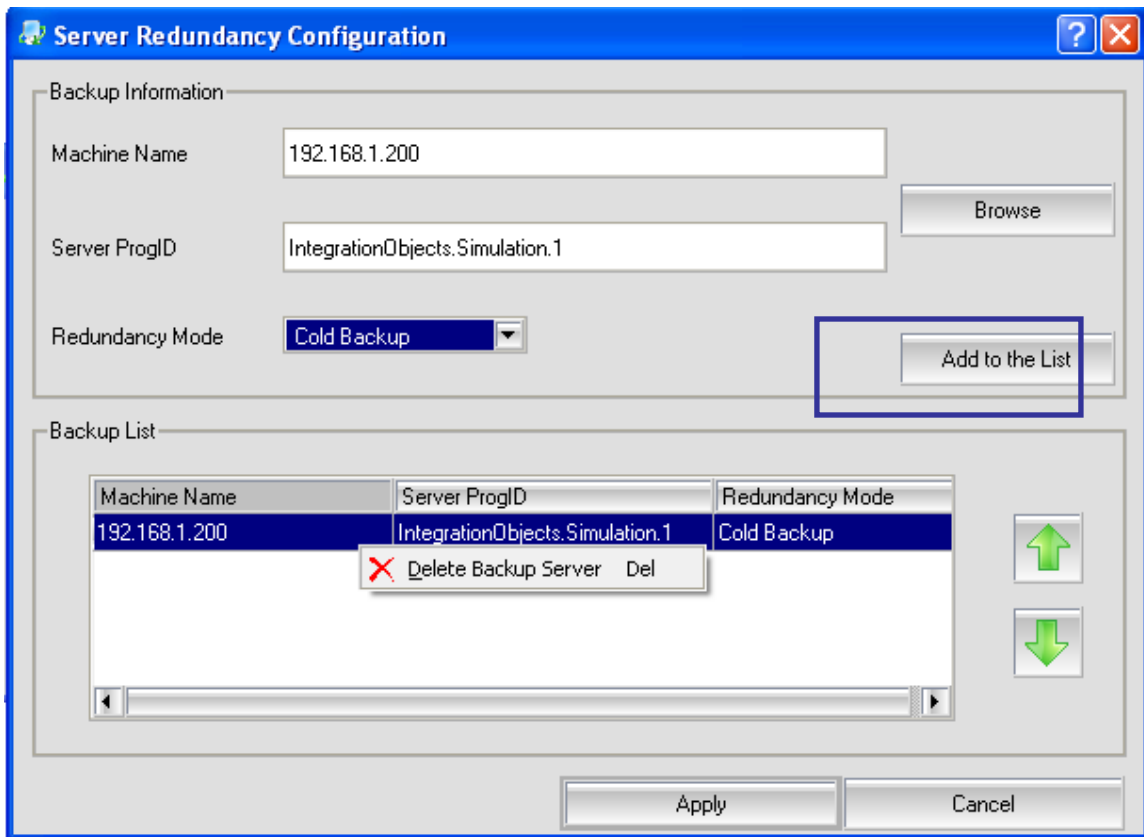


Figure 60: Add/Remove Backup Server

4.2. Client Redundancy

The OPC Data Transfer application also includes a client redundancy feature. This functionality allows the end-user to configure a primary OPC Data Transfer and a backup OPC Data Transfer. When a fail-over of the primary client occurs, the backup application will automatically load and execute the primary configuration file. The master and the backup client communicate using the COM/DCOM architecture.

In order to use this functionality, it must be enabled in the settings side (refer to the settings configuration section).

The 'Client Redundancy' action available under the Redundancy menu or toolbar allows the user to configure the client redundancy. When executing this action, the following dialog will appear:

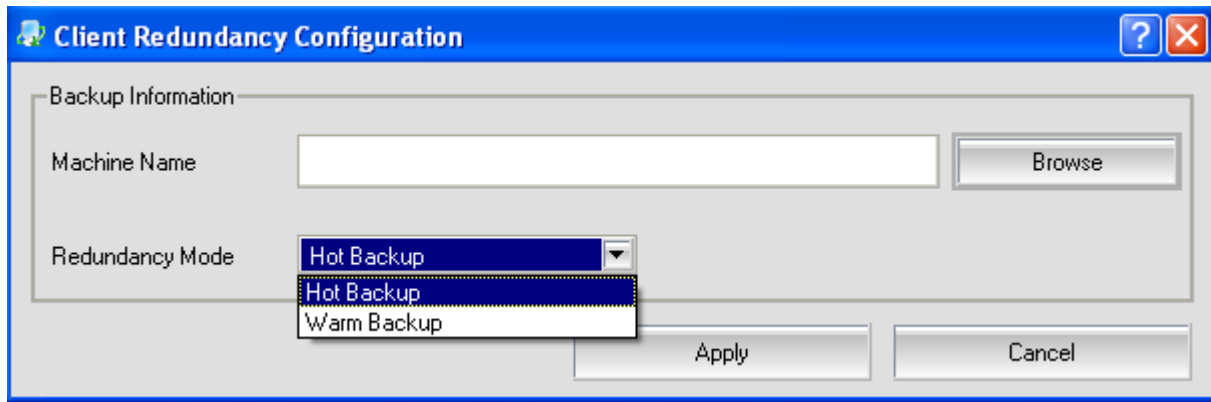


Figure 61: Client Redundancy Configuration Dialog

The end-user has to enter the requested backup information:

Machine Name: The name of the machine hosting the OPC Data Transfer backup. The user can manually enter the machine name or select it by browsing the network using the 'Browse' button.

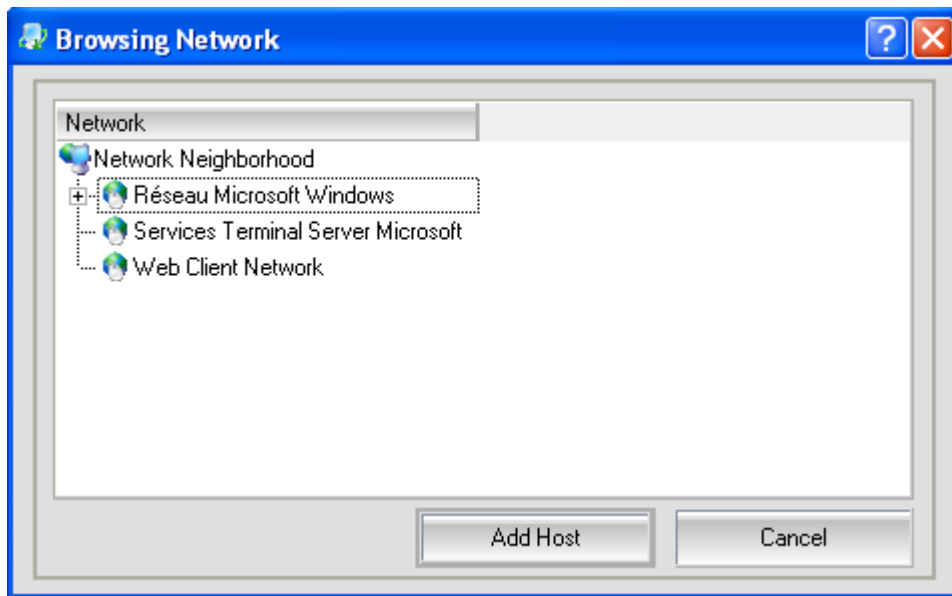


Figure 62: Browsing the network

Redundancy Mode: There are 2 redundancy modes available for the backup OPC Data Transfer:

Warm Mode: the master and the backup OPC Data Transfer applications are periodically communicating but there is no transfer operation created at the backup side.

- **Hot Mode:** the backup OPC Data Transfer application has the same transfer configuration as the master application and each modification at the master side

is effectuated at the backup side. But all transfer operations are not running in the backup application.



There are no common points between the redundancy modes of server redundancy and of client redundancy.

4.3. Email Notification

OPC Data Transfer allows also the operator to configure e-mail notifications. This functionality is very useful. In fact, OPC Data Transfer will send e-mails notifying the operator of any occurred fail-over at any connected master server or at the master client (if the client redundancy is configured).

To configure this functionality, choose the 'E-mail Notification' action available at the Redundancy menu or tool bar. After executing this action, the following dialog will be displayed:

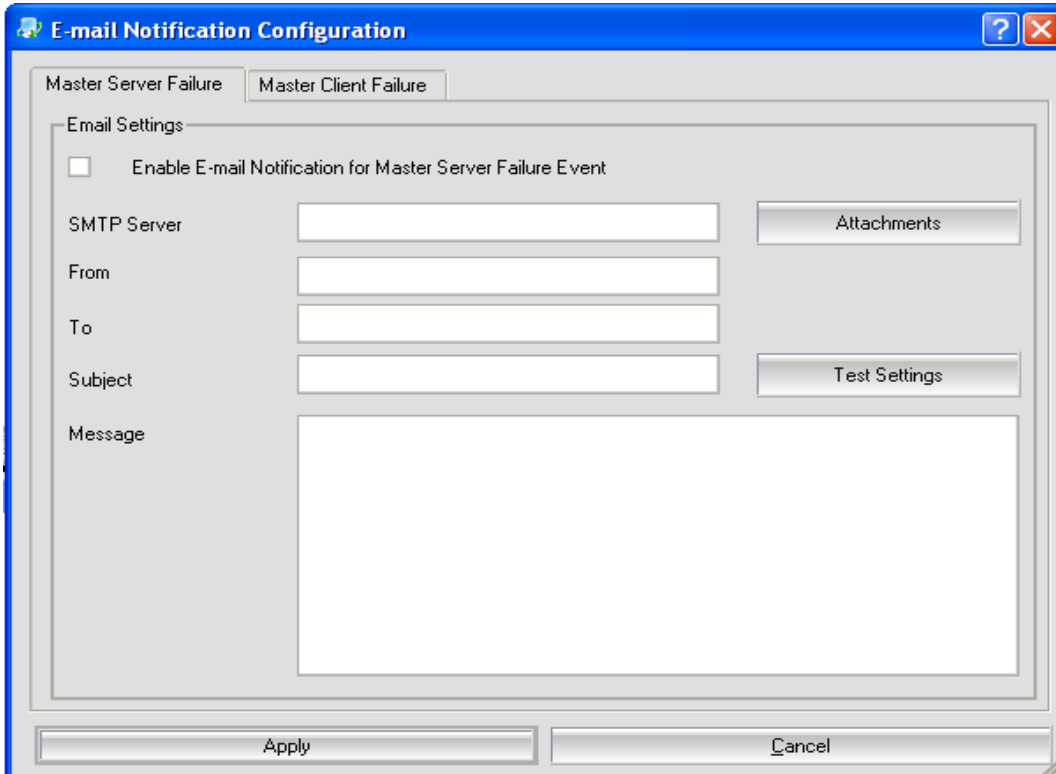


Figure 63: E-mail Notification Configuration

The information needed to configure E-mail notification for master server/client failure is:

- **SMTP Server:** The SMTP server used to send the e-mails.
- **From:** The sender e-mail account.
- **To:** The receiver e-mail accounts. The user can specify multiple recipients accounts separated by ‘;’.

- **Subject:** The e-mail subject.
- **Message:** The e-mail message.
- **Attachments:** The user can also specify file attachments that will be attached to the sent e-mail.

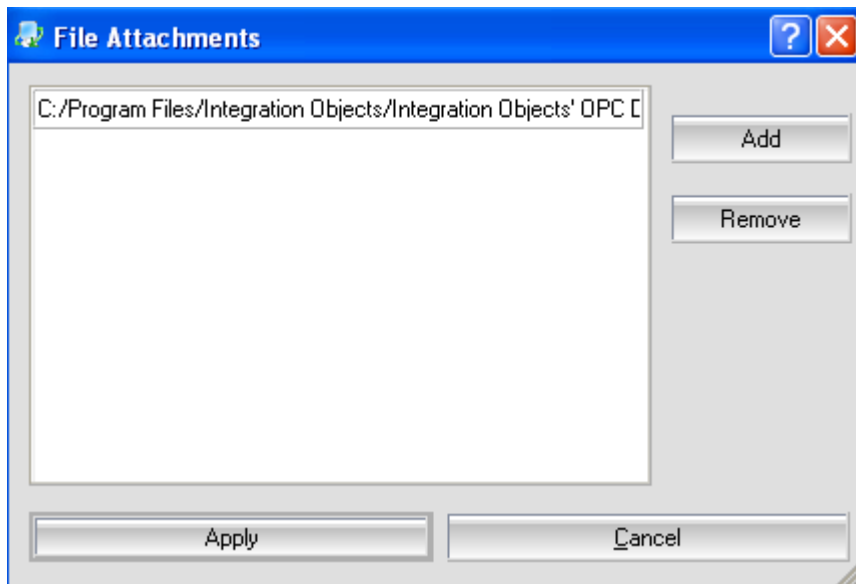


Figure 64: File Attachments

Before validating the input configuration, the end-user can test it using the 'Test Settings' button and a test e-mail will be sent to the incoming mailbox of the recipient.

FAST DB LOG VIEWER

The main log messages generated by OPC Data Transfer are stored in a fast data base using a file with an 'fdb' extension. In order to be able to read this file, a fast DB log viewer was included in the OPC Data Transfer package. The log viewer allows the user to view log messages in real time without having to close and open the file. In this section of the manual, we will describe how to use and manage the log viewer tool.

1. Interface Overview

The log viewer graphical interface is mainly composed of a table displaying the log messages. This table contains the following columns:

- **Source:** The source method of the occurred event. This field will help Integration Objects' support engineers diagnose possibly encountered problems.
- **Level:** The level of the corresponding log message (info, error or warning).
- **Date:** The date of the corresponding log message.
- **Time:** The time of the corresponding log message.
- **Event:** this column contains a message describing the occurred event.
- **Help Message:** For some error messages, a help message will be displayed such as the exact returned error code in order to help the user diagnose the encountered problem.

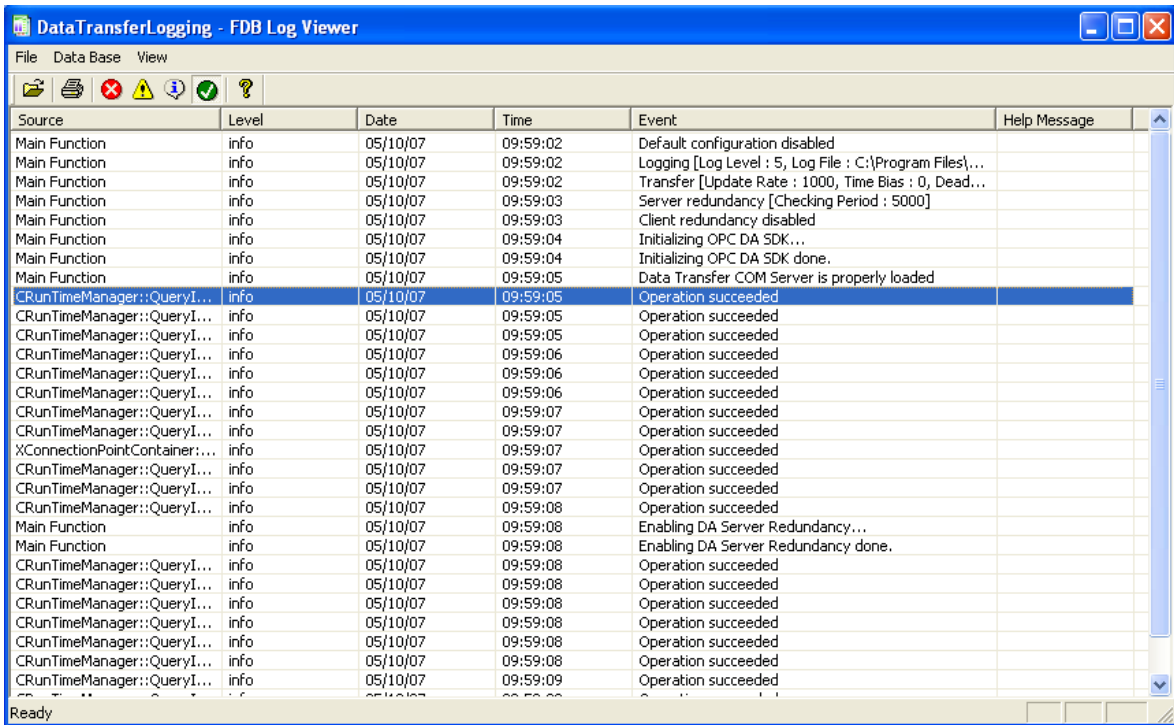


Figure 65: Fast DB Log Viewer Interface

2. Interface Features

The end-user can use the log viewer interface to load, reload and print a data transfer log fast database.

This version of the log viewer allows you also to preview the print, modify the layout of the printed page, clear the database, export it into a text file and sort the messages by time, date, source, etc.

It includes 4 different modes of display:

- Display only error messages,
- Display only warning messages,
- Display only information messages,
- Display all log messages (default mode).



Figure 66: Display Modes

For additional information on this guide, questions or problems to report, please contact:

Offices

- Americas: +1 713 609 9208
- Europe-Africa-Middle East: +216 71 195 360

Email

- Support Services: customerservice@integrationobjects.com
- Sales: sales@integrationobjects.com

To find out how you can benefit from other Integration Objects products and custom-designed solutions, please visit our website:

Online

- www.integrationobjects.com