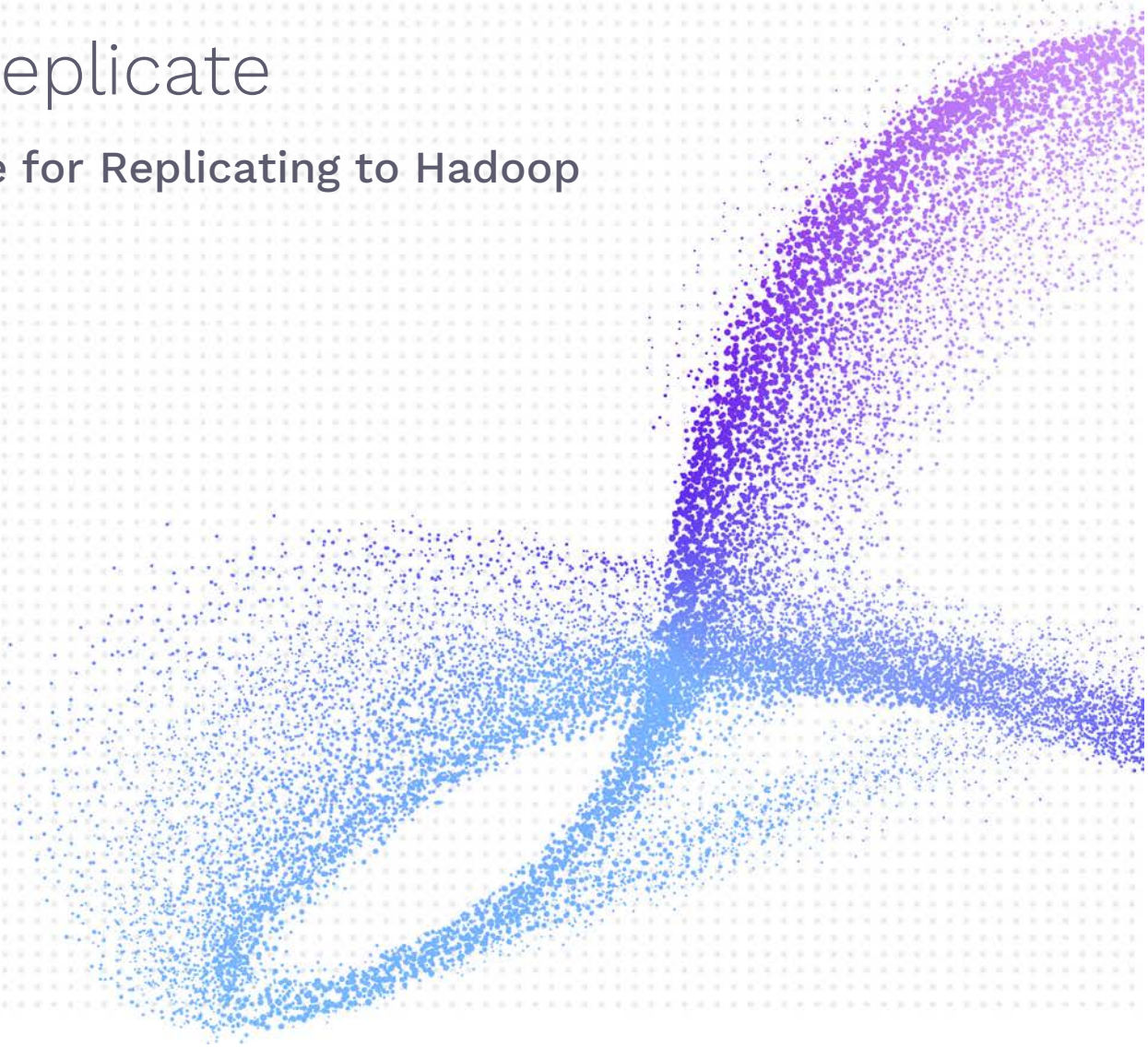
Syniti

Syniti Replicate

Setup Guide for Replicating to Hadoop

Version 10.2



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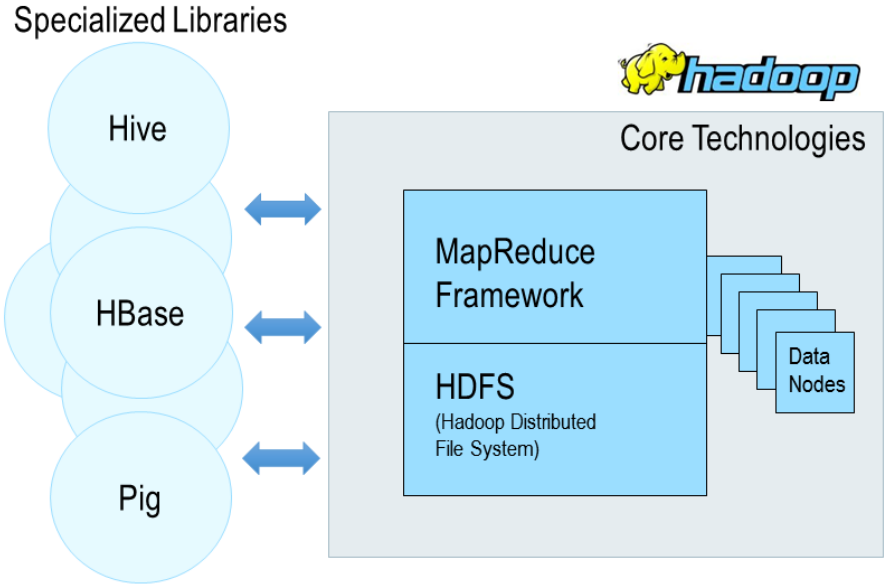
Introduction

Syniti Replicate allows you to replicate data from relational database tables to the Hadoop Distributive File System (HDFS) using:

- **Refresh**, or **Snapshot**, replication: a one-time complete replication from any major relational database source to HDFS as a target, according to replication settings and scripts.
- **Mirroring**, or **Change Data Capture**, replication: a continuous read of changes to the source database that have been recorded in the database server log. Any changes found in the log are applied to HDFS as a target, according to replication settings and scripts.

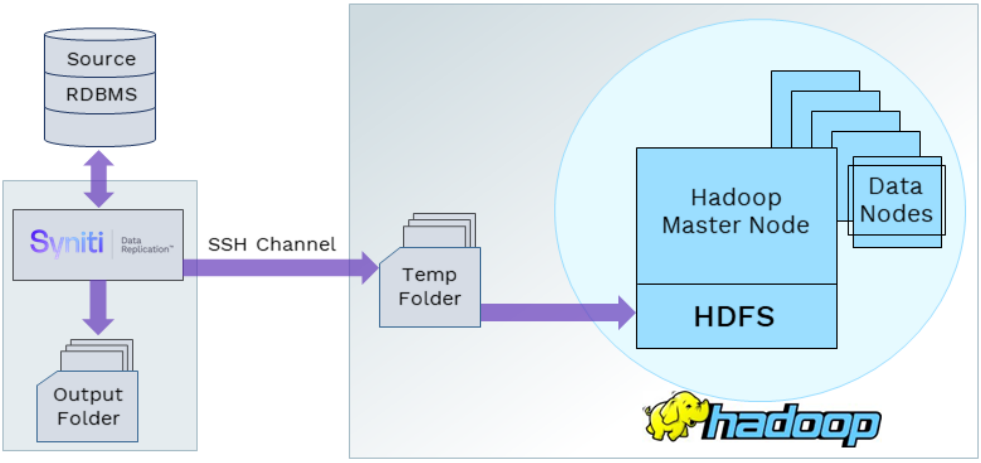
The approach to replicating data provides a flexible, configurable solution which takes advantage of stable core Hadoop technology (HDFS) to:

- By-pass evolving specialized libraries
- Work on all distributions of Hadoop
- Allow Hadoop to manage data distribution



You can control the timing of the replication, identify the columns to be replicated and add scripts to transform data during replication. Source databases include Oracle, Microsoft SQL Server, IBM DB2 for i, IBM DB2 LUW, Sybase, Informix, MySQL. When HDFS is used as a target, Syniti Replicate transfers data as CSV files then uses the Syniti Replicate File Broker service to communicate with HDFS.

Syniti Replicate replication to Hadoop is supported in Hadoop Version 2.6.0 or above.



Basic Configuration Steps

Use Syniti Replicate Management Center to:

- Create source connections to RDBMS tables
- Create Hadoop HDFS targets
- Map RDBMS sources to Hadoop HDFS
- Enable replication

Subsequent data management on the HDFS side depends upon your application needs.

Connection Type

Syniti proprietary connector: Hadoop Data Provider. There is no need to install any additional connection software.

Setup Summary

This section provides a summary of all the steps required for setting up and using Syniti Replicate. Use the link for each step for more information.

Install. NET Provider for Source Database	Help Center Database Access Provider List (.NET and ODBC)
Download and Install Syniti Replicate	The Knowledge Platform Product Suites article acts as a hub to point to various resources. To download and/or register Syniti Replicate, log in to the support site, then click the relevant link in the Replicate section of the article. • Syniti Knowledge Base • Enter a generic support ticket
Syniti Replicate Setup	In the Syniti Replicate Management Center: 1. In the Metadata Explorer, create a source connection to your RDBMS.

(See Steps for Replicating Tables below)	2. Create a target connection using the provider “Hadoop HDFS”. 3. Create a replication.
Start Replicating (See Start Replications)	In the Syniti Replicate Service Monitor: 1. Start the Syniti Replication Agent.

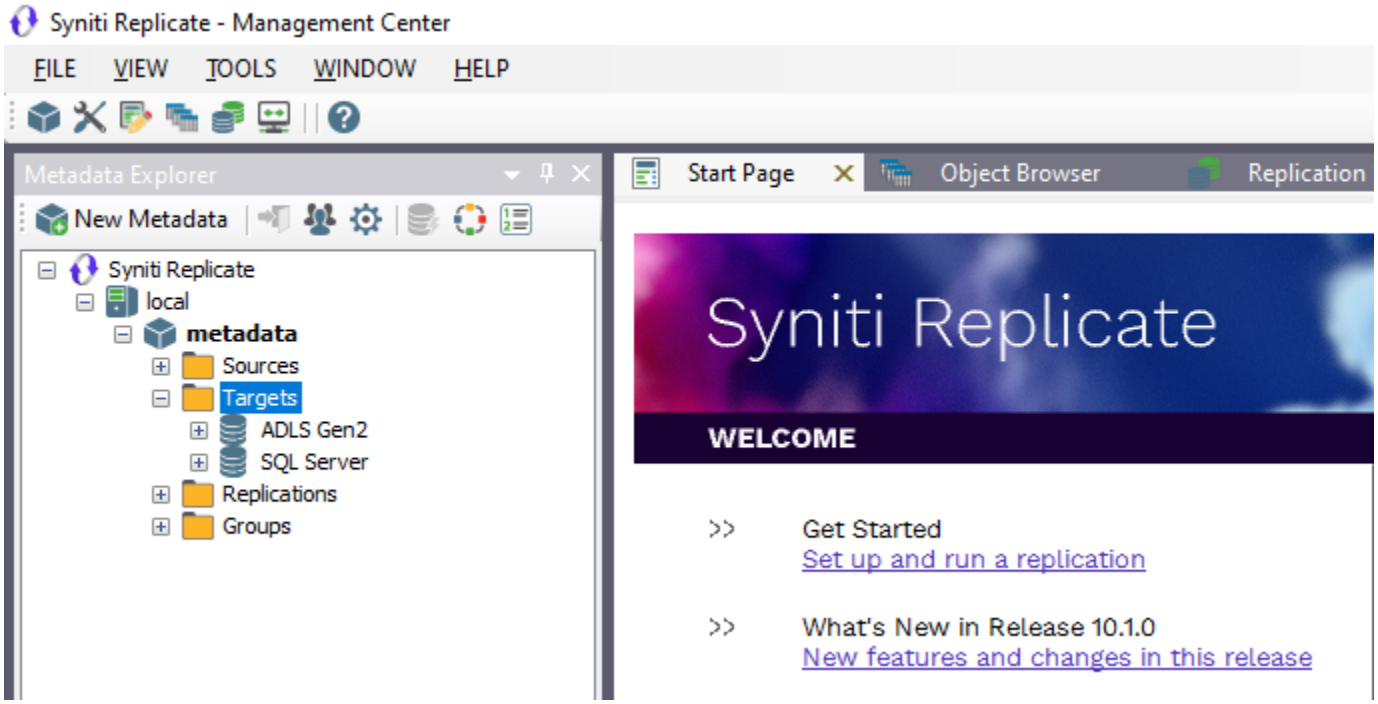
Steps for Replicating Tables

Syniti Replicate support for replicating relational data to Hadoop HDFS allows you to set up replications using either **Refresh** or **Mirroring** modes.

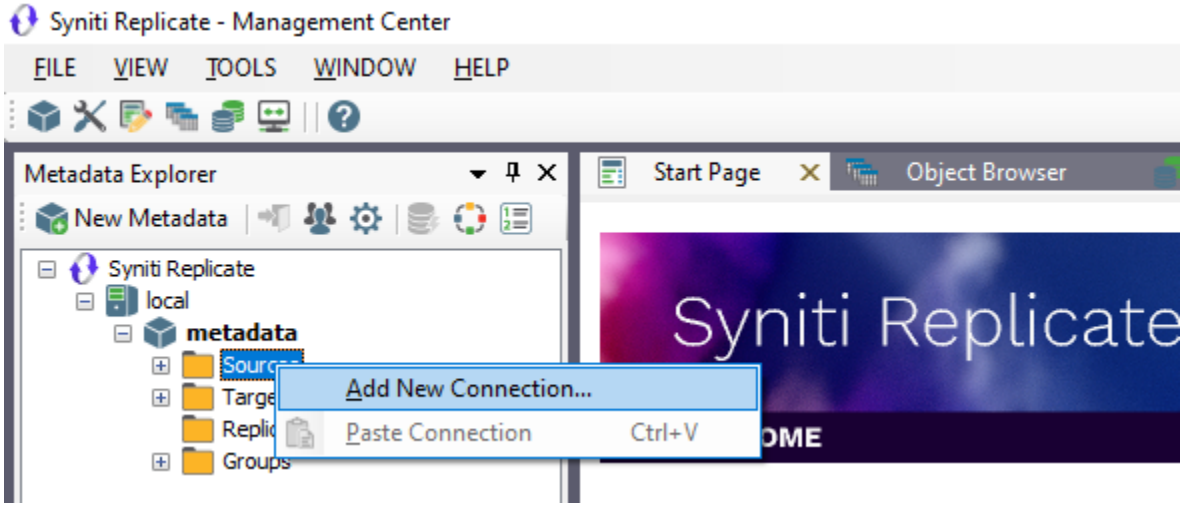
The steps below explain how to replicate data from a relational database to the Hadoop HDFS environment. Check the Help Center for the latest list of supported databases.

1. Set Up a Source Connection to a Relational Database

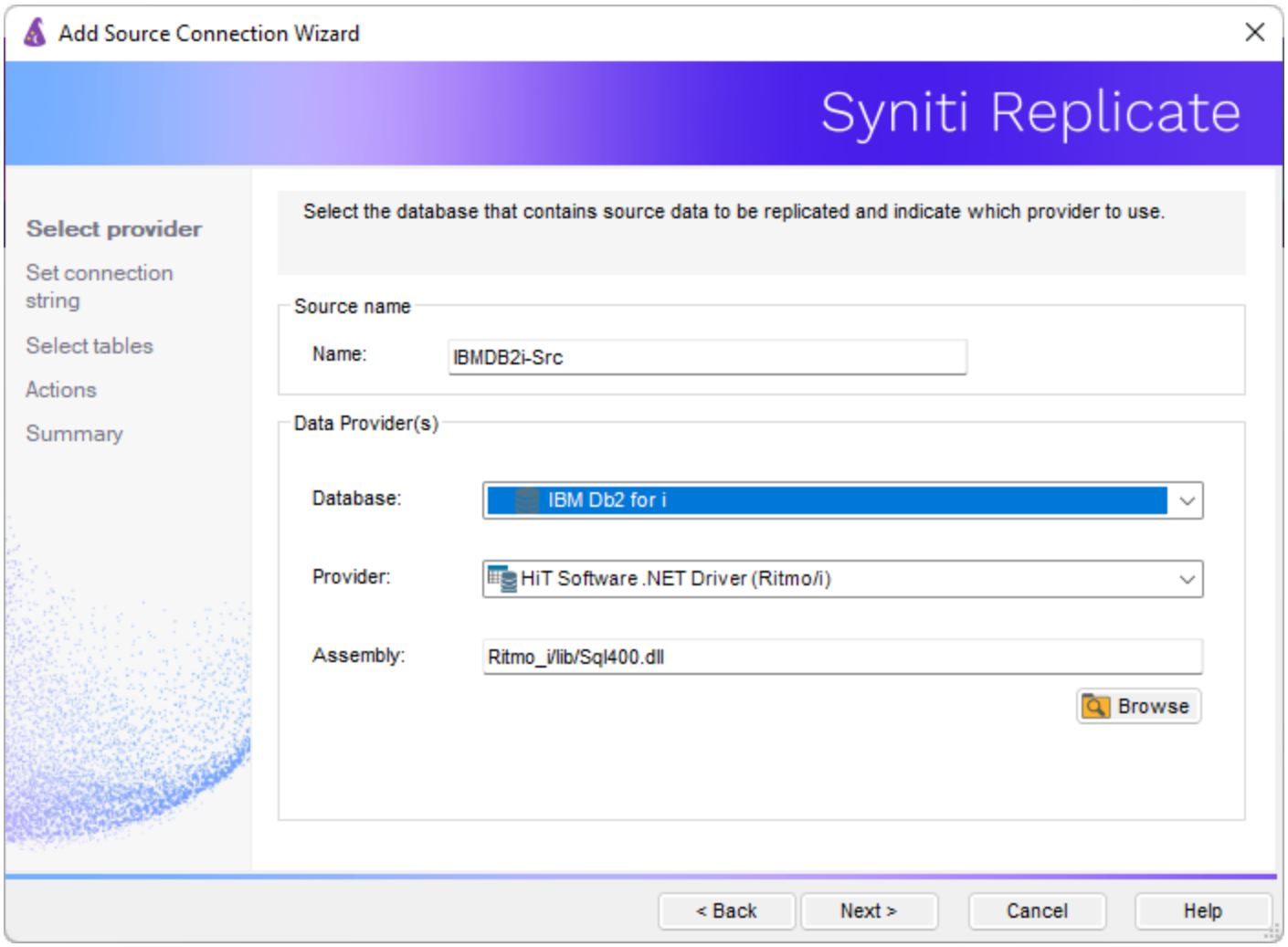
1. Make sure you have database connections via a .NET data provider to your source database. For each database you are planning to use in your replication project:
    - Install and configure your .NET Provider.
    - From the provider, test the connection to the database.
    - Create a connection string for the data access product/database you are using. Check the documentation for the data access product for information on how to do this.
    - Check that the user ID you are planning to use has sufficient permissions to complete all operations in Syniti Replicate. Contact the support team via the Help Center for specific requirements for your database.
2. Start Syniti Replicate Management Center.
   Syniti Replicate provides a default database (Microsoft SQL Server CE) for your metadata, all the information that Syniti Replicate needs to store about your replication setup.



3. In the Metadata Explorer, expand the metadata node to view the **Sources** and **Targets** nodes.
4. Select the **Sources** node.
5. From the right mouse button menu, choose **Add New Connection**.



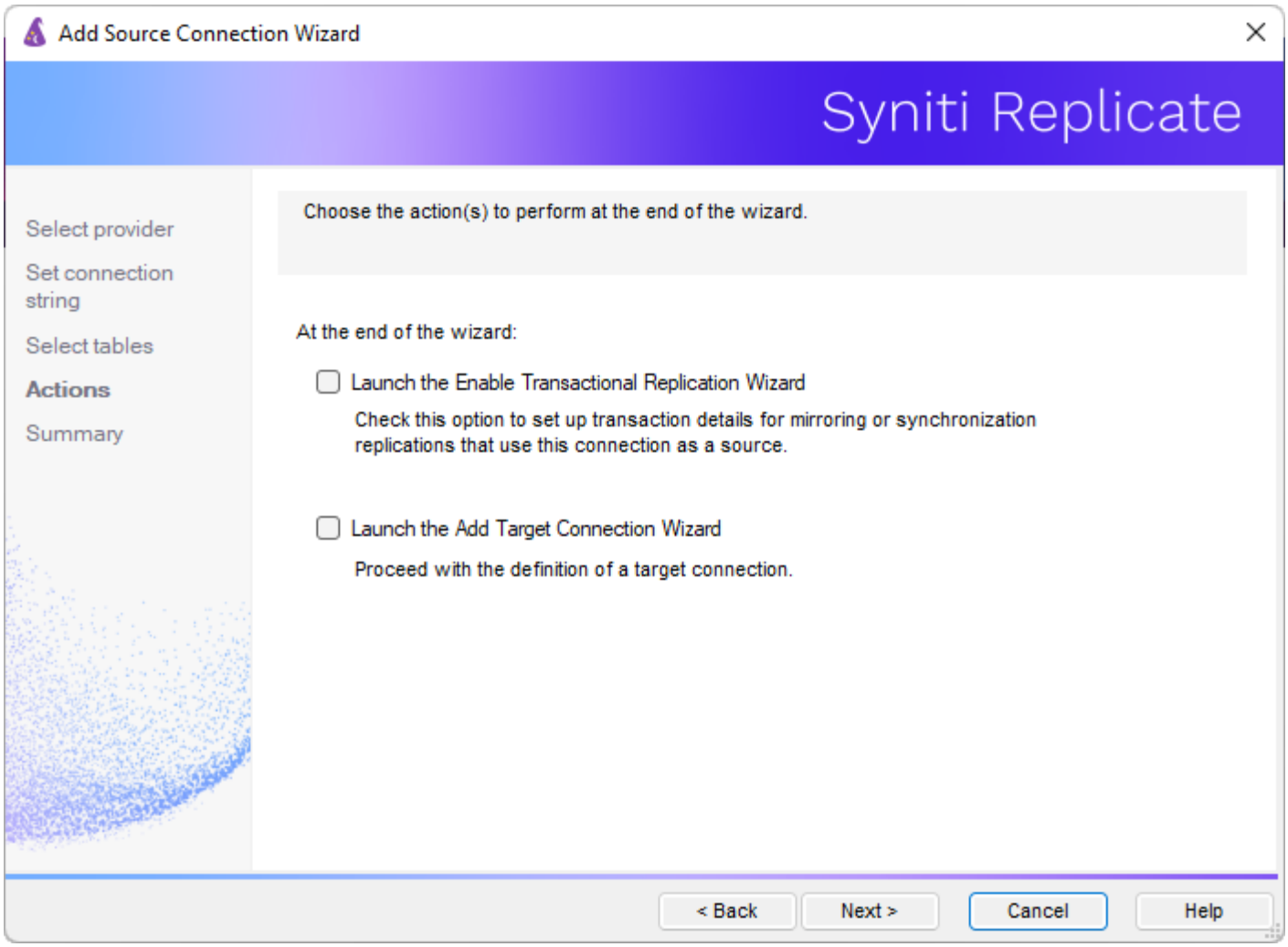
6. In the Source Connection Wizard, follow steps to add a connection string and test the connection to the database.
   Check the Supported Provider List in the Help Center before entering a value in the **Assembly** field.



7. In the **Set Connection String** screen, fill out the following fields:

   Connection Properties
   Edit at least the **Required** connection properties by clicking in the property value field and typing a new value.
   Note: If using an Oracle 11 client, in the Data Source field, be sure to add the **Oracle Service Name** after the IP address.

8. In the **Select Tables** screen, choose the tables that you plan to replicate.
9. In the **Actions** screen, check the option **Launch the Enable Transactional Setup Wizard**.



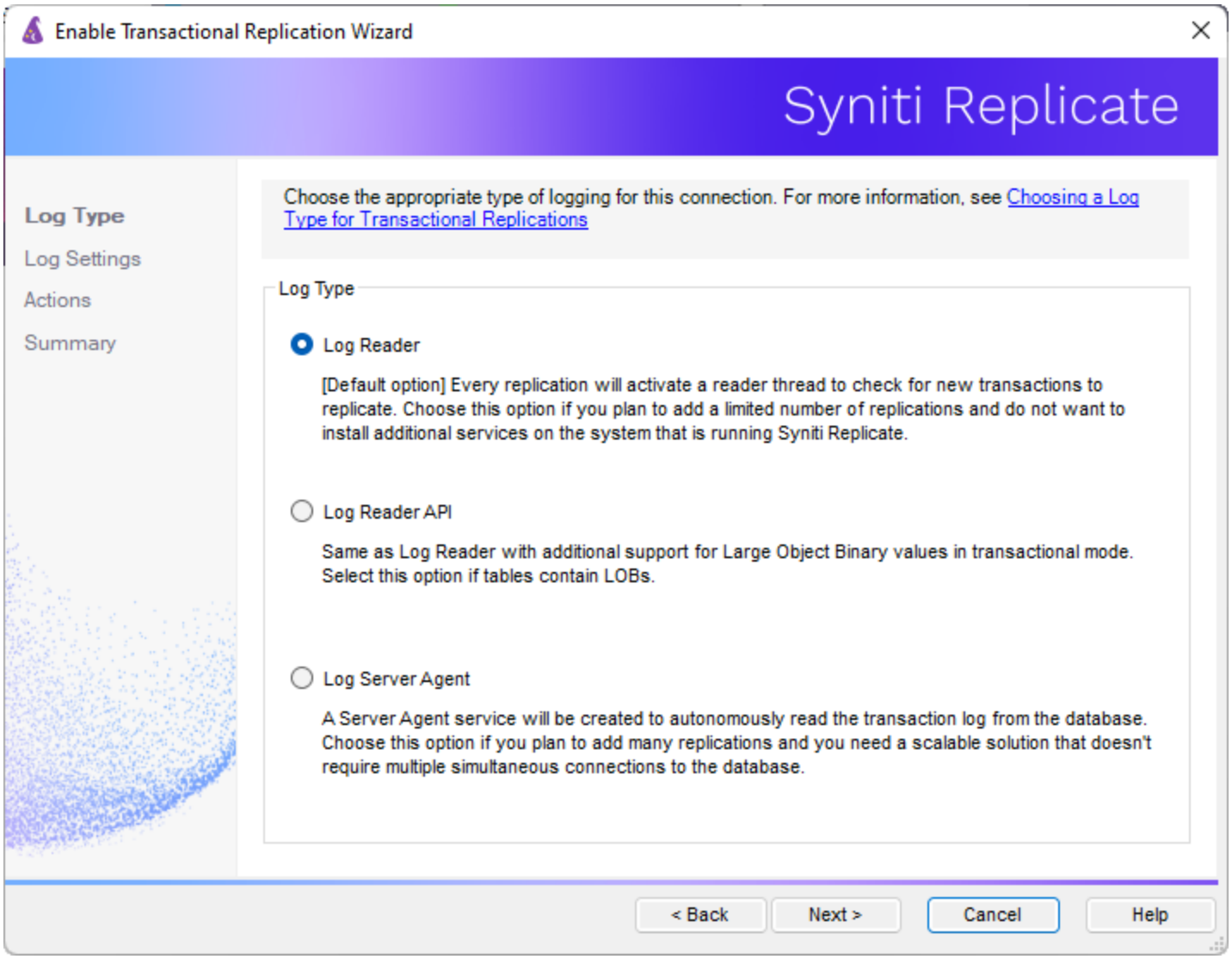
10. Complete the wizard.

2. Enable Transactional Replication

This section assumes you are planning to replicate data to an HDFS flat file target using mirroring (rather than Refresh) from a relational database. For Refresh replications, you do not need to complete the Enable Transactional Replication wizard. If you have checked the Source Connection wizard option to launch the Enable Transactional Replication wizard, follow the steps below. To open the wizard from the Management Center, choose the connection in the Metadata Explorer, then right-click to choose Transactional Setup > Enable...

In the **Enable Transactional Replication wizard**:

1. Select the type of transactional replication to use. The options depend on the source database and can include log reader, log server agent, triggers, plus log reader API (for IBM Db2 for i only). Check the Syniti Replicate help for more information on the best option.



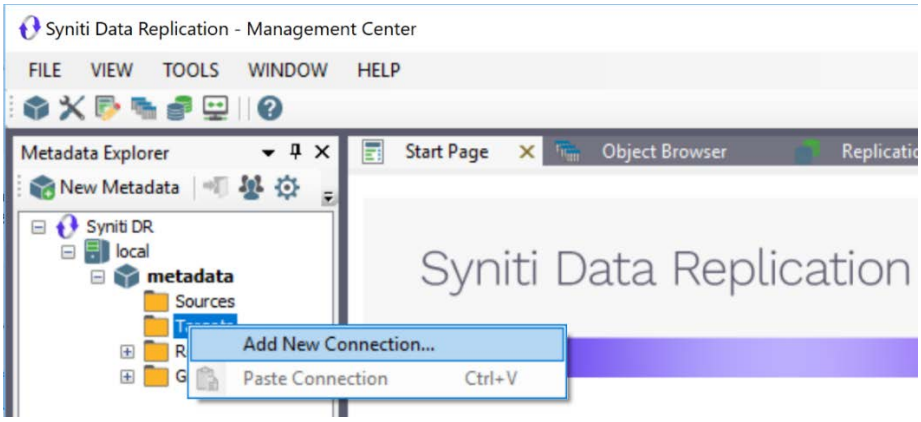
2. Click **Next** to enter the log settings. The fields and appropriate values depend on the database and log type. You can obtain a setup guide for a specific relational database by making a request in the Help Center.
3. Click **Next** to verify your settings against the source connection to the database. If any information is missing, you will not be able to proceed.
4. In the Actions screen, check the option to launch the **Add Target Connection wizard**.
5. Click **Next** to review your changes.
6. Click **Finish** to complete the wizard.

The source connection is now set up for transactional replications.

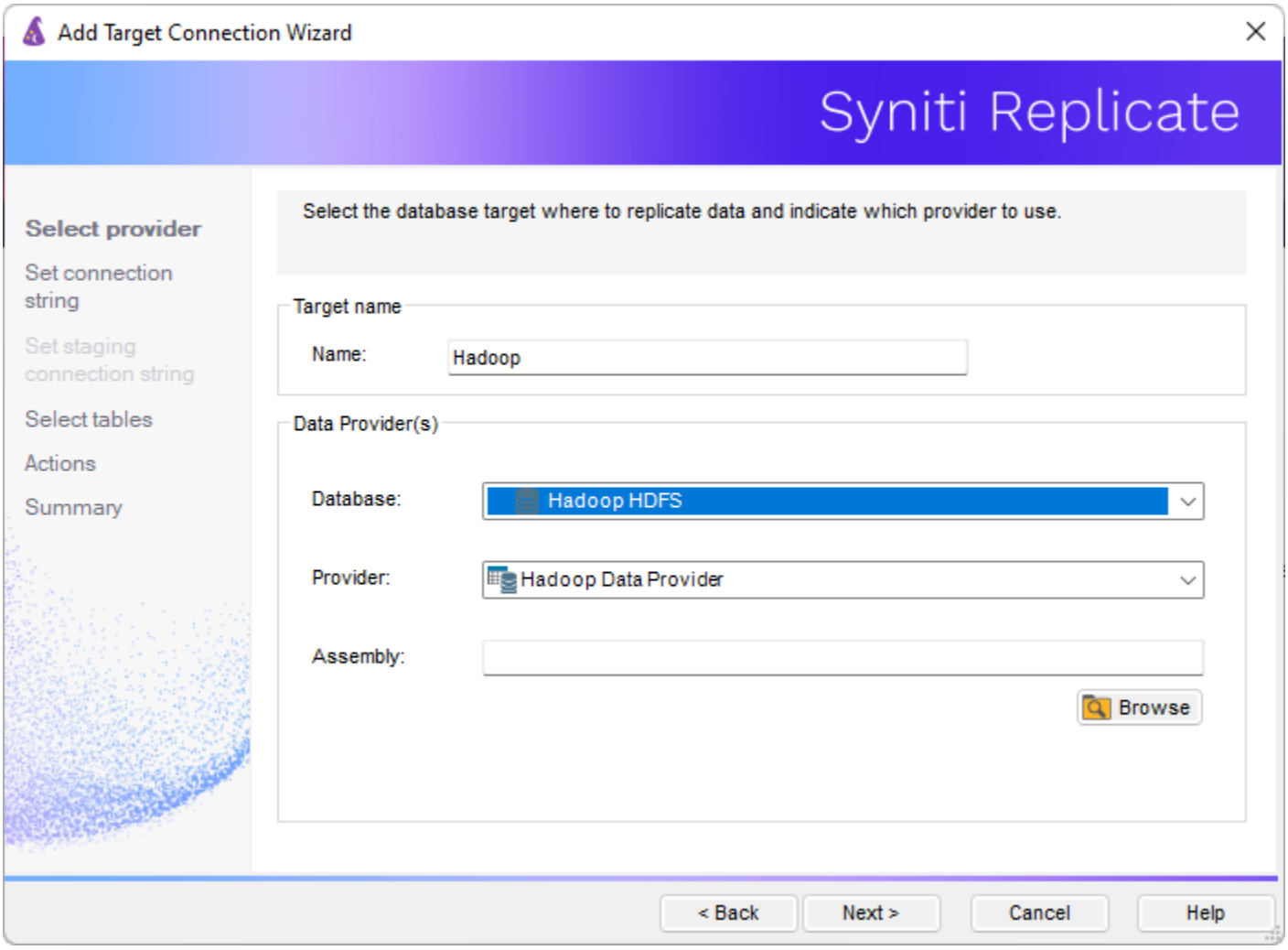
3. Set up a Target Connection to Hadoop HDFS

1. Select the **Targets** node.

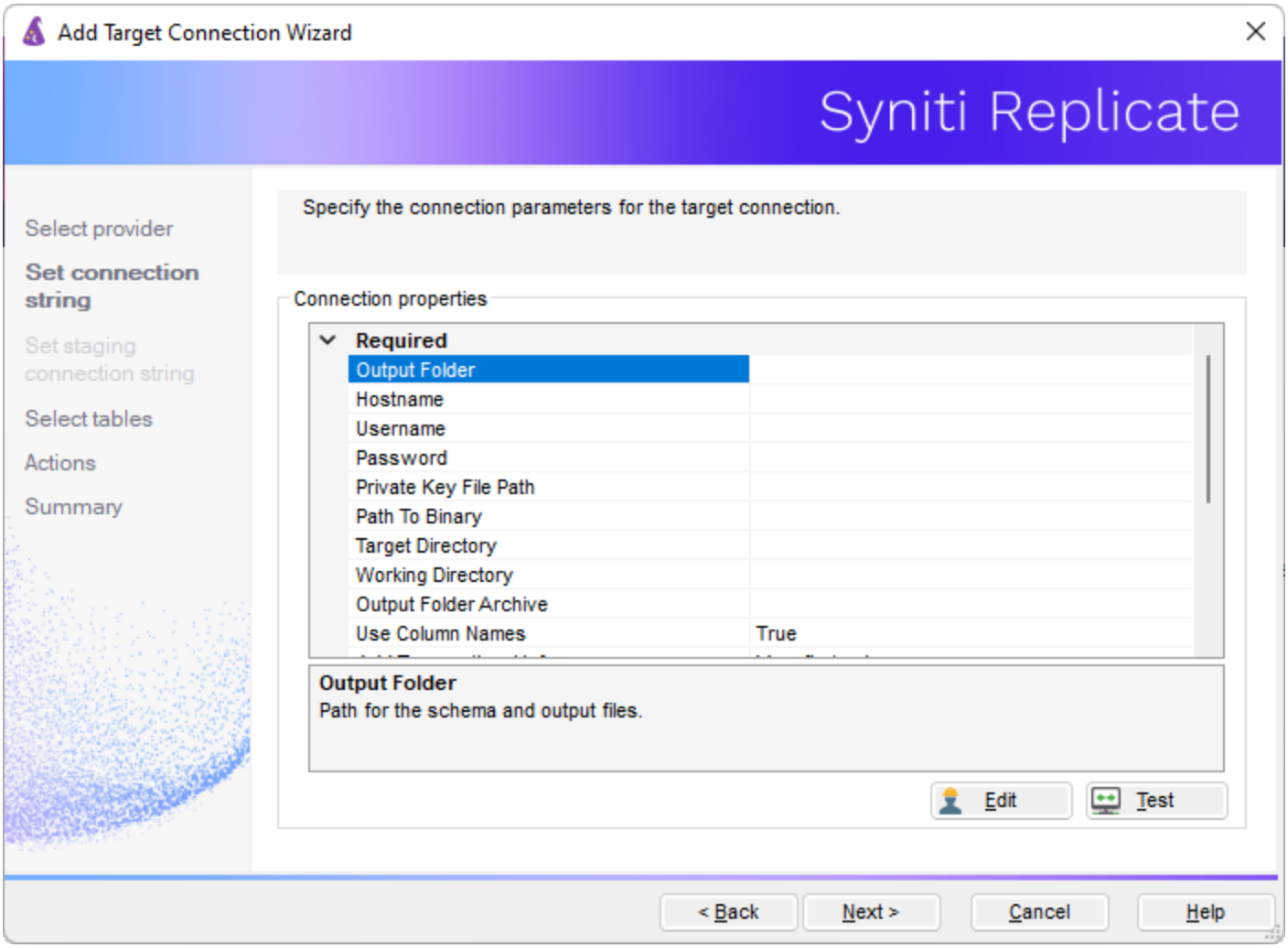
2. From the right mouse button menu, choose **Add New Connection**.



3. In the Add Target Connection Wizard **Provider** field, select the **Hadoop HDFS** option.



4. In the **Set Connection String** page, set properties as described in the table below.



Output Folder	An existing folder on the system that is running Syniti Replicate for files associated with replications to Hadoop.
Hostname	The server name for the system running Hadoop.
Username	The user name for the Hadoop instance.
Password_KeyFile	Either a password or more typically a key file (.ppk extension)
Path to Binary	Pathname to the Hadoop binary, ending in hadoop e.g. /home/hadoop-2.7.7/bin/hadoop

	Use the command 'which hadoop' from the SSH command line to find the location of the executable file.
Target Directory	HDFS directory where files will be uploaded.
Working Directory	Temporary server directory where files will be stored before moving them to HDFS. Files are managed by Syniti Replicate.
Output Folder Archive	Optional. Provides a local copy of data replicated to Hadoop. Data is not managed by Syniti Replicate, so the files must be managed manually and could grow quickly.
Add Transactional Info	Set to Yes if performing mirroring replications

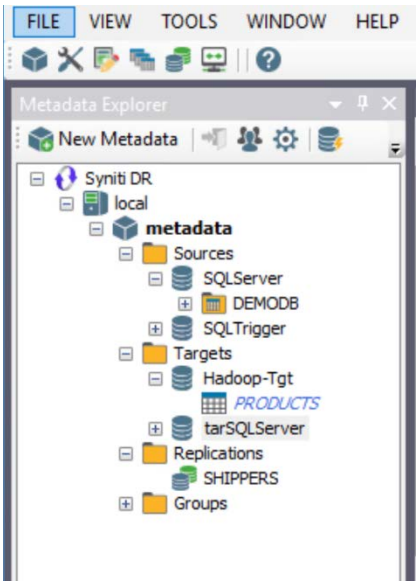
5. Click **Next** to display the **Select tables** page.
   At this point, there is no text output structure available to display. You can add the information after completing the Target Connection wizard.
6. Click **Next** to display the **Summary** page.
7. Click **Finish** to complete the wizard.

4. Add Table Information to the Target Connection

The target connection is displayed in the Metadata Explorer, but you still need to add the file representation for source table data so that when you create replications below, you can specify a source table and target "file."

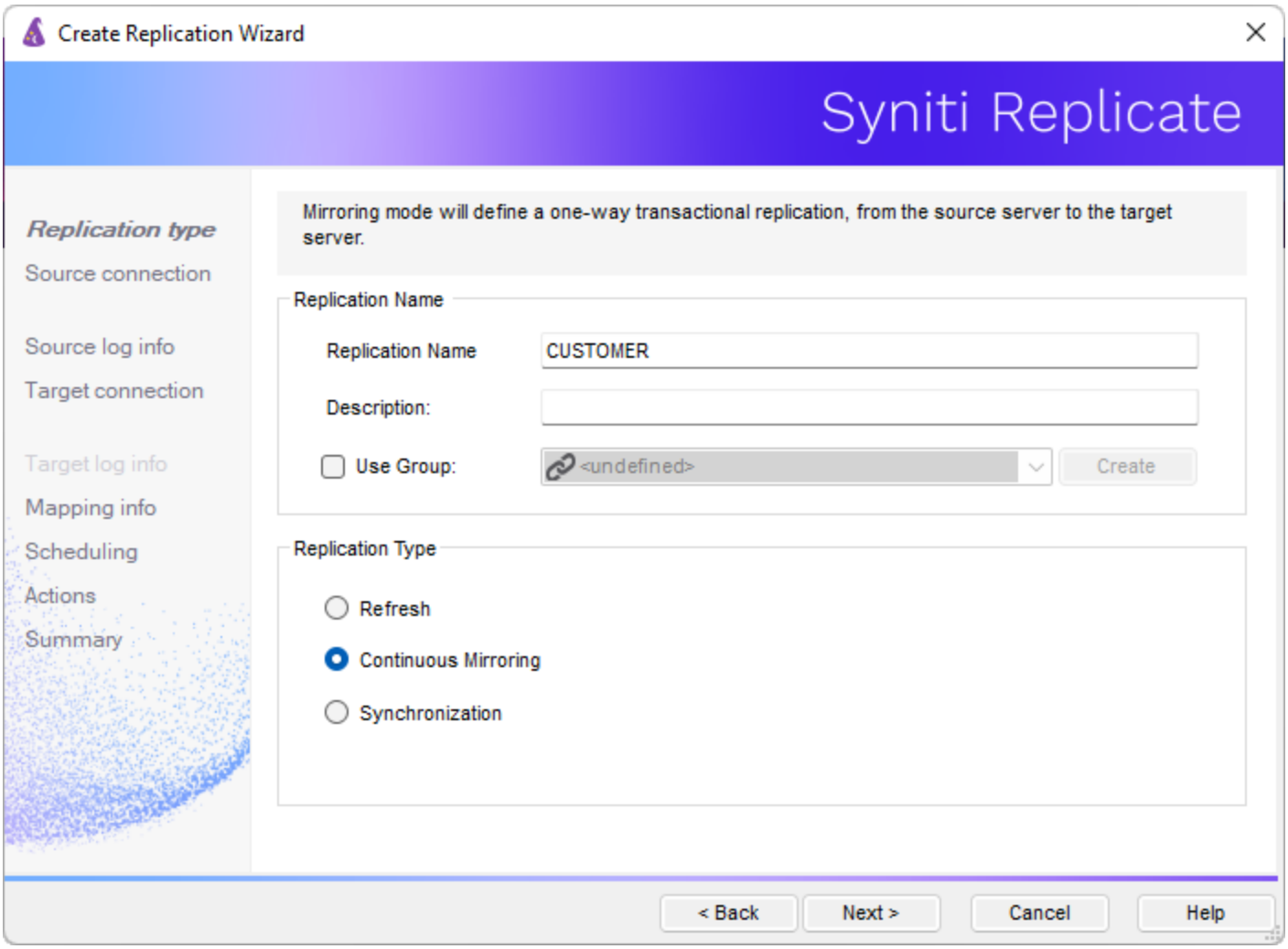
1. In the Metadata Explorer, expand the source connection you created above.
2. Select and drag a source table to the target file connection.
3. The Create Target Table wizard is displayed.
   Although you are not actually creating tables, you can use this wizard to create a representation of the file data.
4. In the **Source Connection** screen, you should see the source table you selected above.
5. Click **Next** to display the **Target Connection** screen.
6. Verify that the screen displays the correct target connection name, and table name.
7. Click **Next** to review the table structure.
   At this point, you can modify data types, null values and so on, if you want to modify the data eventually sent to a file.
8. Click **Next** to display the **SQL Script** screen.
   The contents of this screen are inactive because there is no editable SQL script to create a table. Instead, Syniti Replicate outputs the table information to a file.
9. Click **Next** to display the **Summary** screen.
10. Click **Finish** to create the table representation in the Metadata Explorer.
11. Click **Yes** to add the table name to the target connection entry in the Metadata Explorer
12. Repeat steps 2 through 11 for each source table that you want to replicate to a file.

At the end of this process, you should have a list of table representations under the target connection in the Metadata Explorer.

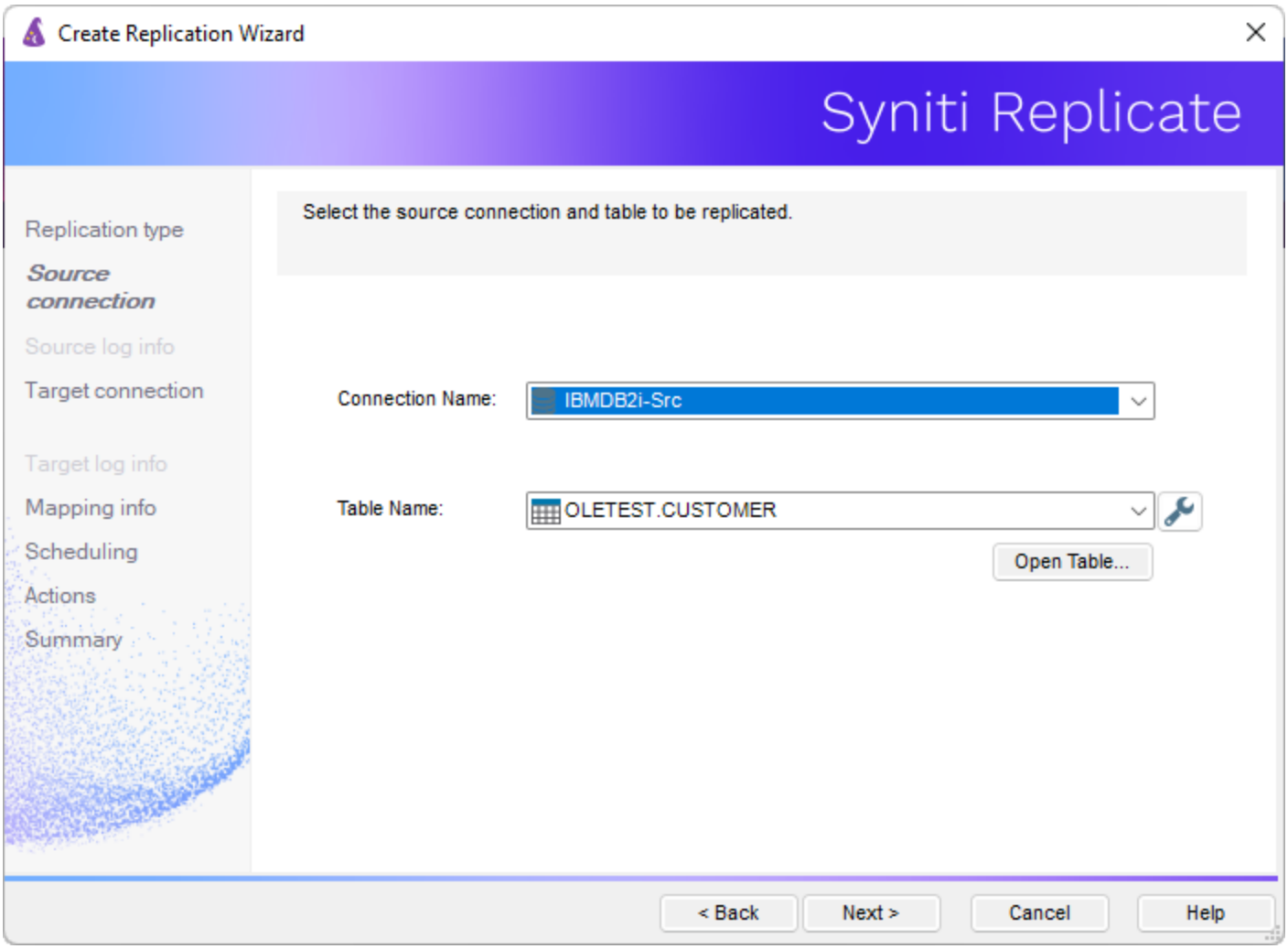


5. Define Replications

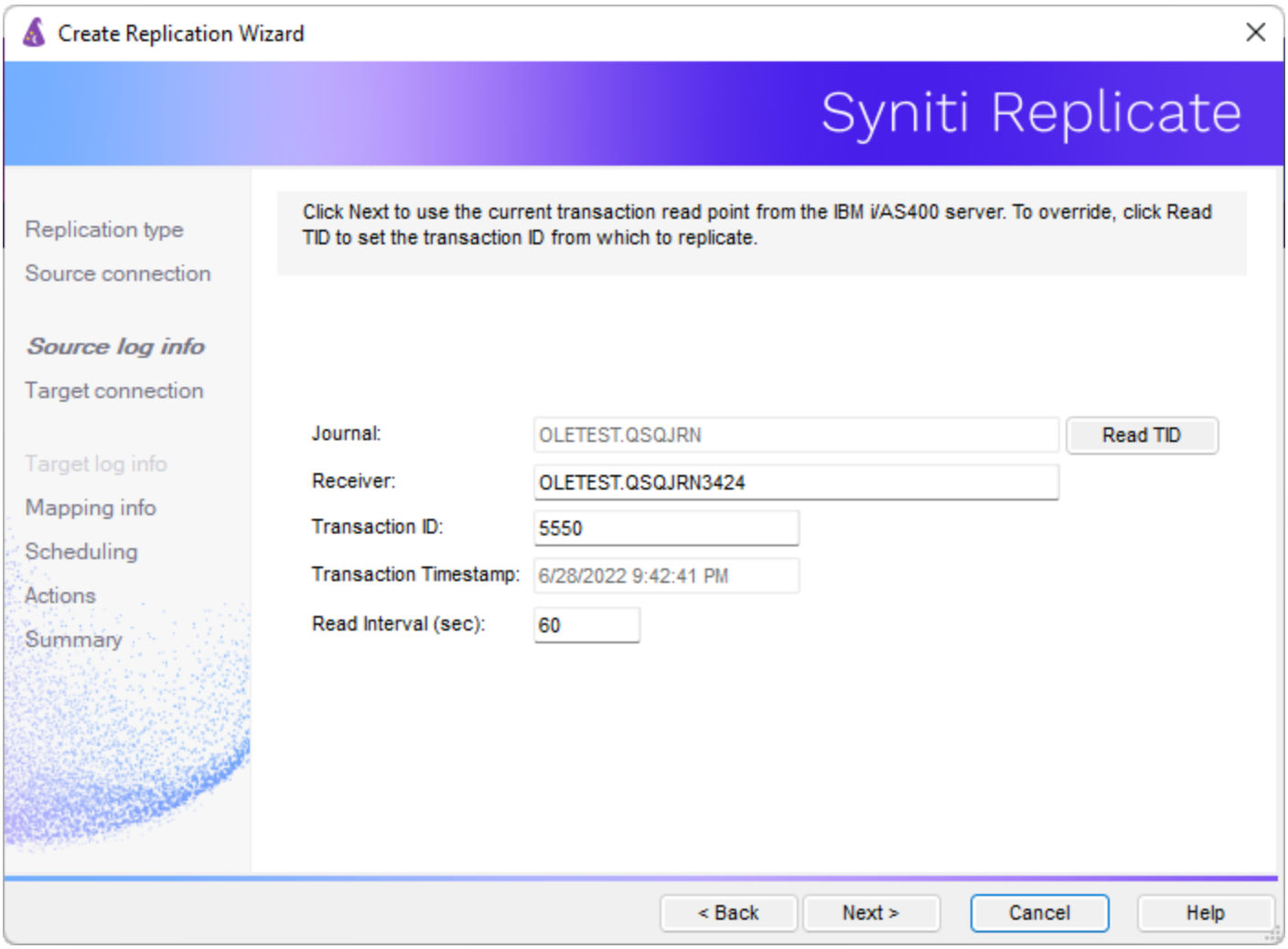
1. Expand the Metadata Explorer tree to display the table that contains the data you want to replicate.
2. Select the table.
3. From the right mouse button menu, choose Replication then Create New Replicaton....
4. In the Define Replication Type screen, type a name to identify the replication.
5. Optionally provide a description of the replication.
6. In the **Replication Mode** area, choose **Refresh** or **Continuous Mirroring**.



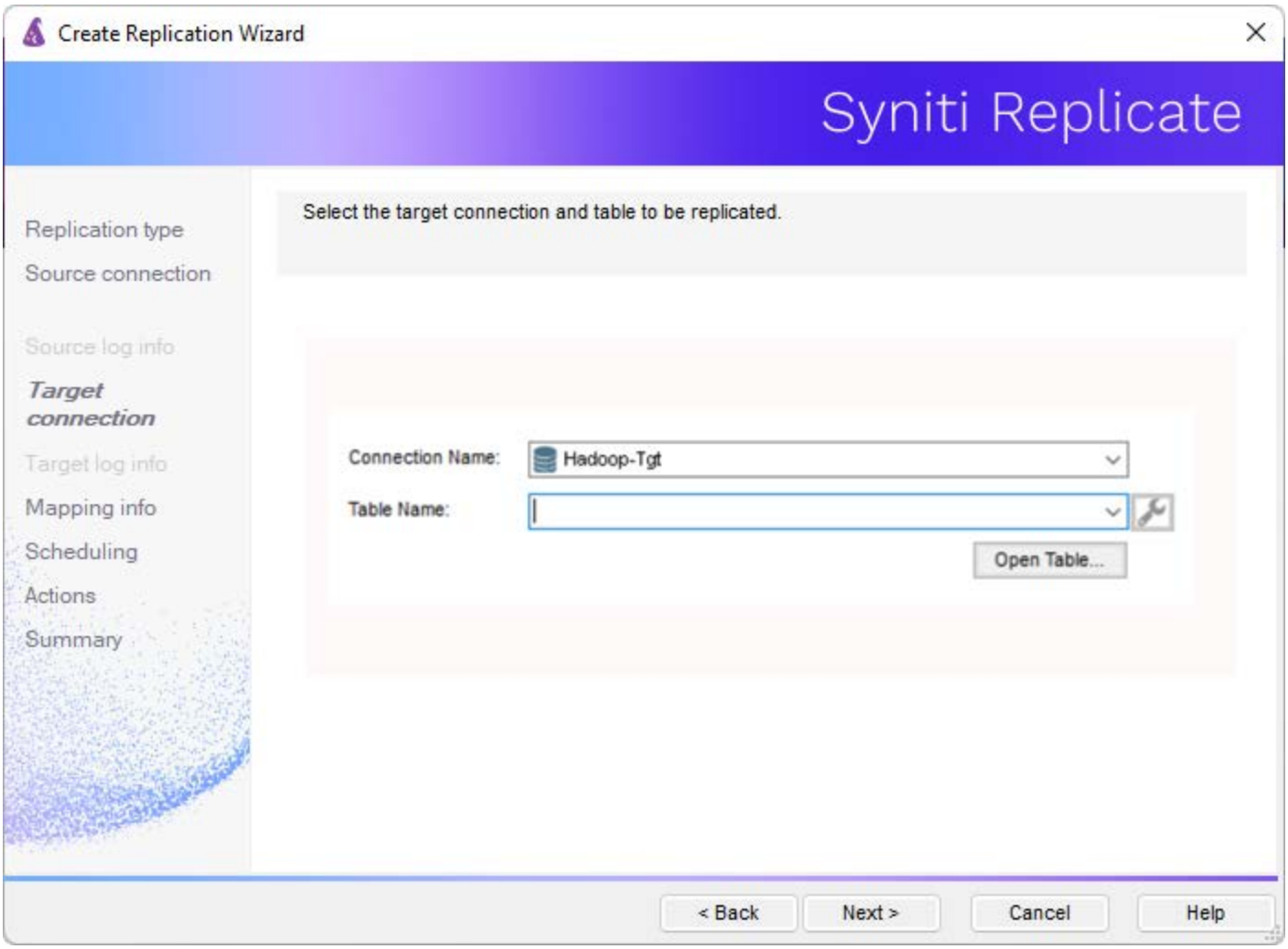
7. Click **Next** to go to the **Select Source Connection** screen.



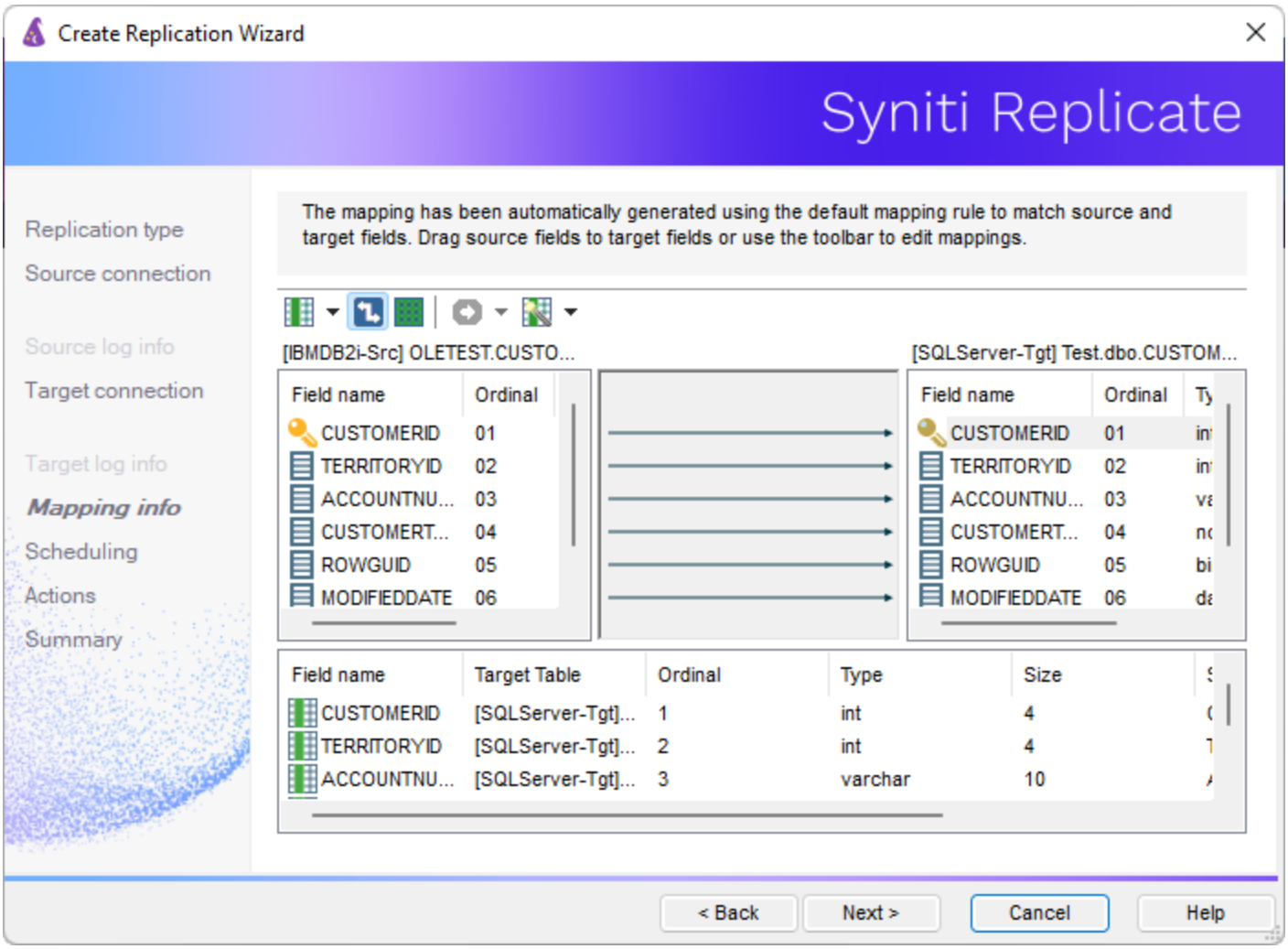
8. Choose the source connection name from the drop-down list that includes all the source connections you have created in Syniti Replicate.
9. Choose the table that you want to replicate from the drop-down list.
10. If you want more information about the table before proceeding, click **Open Table...**.
11. Click **Next** to go to the **Source Log Info** screen (if using Continuous Mirroring).
    Complete the fields in this screen only if you are setting up a mirroring replication. The fields displayed depend on the source database log type.



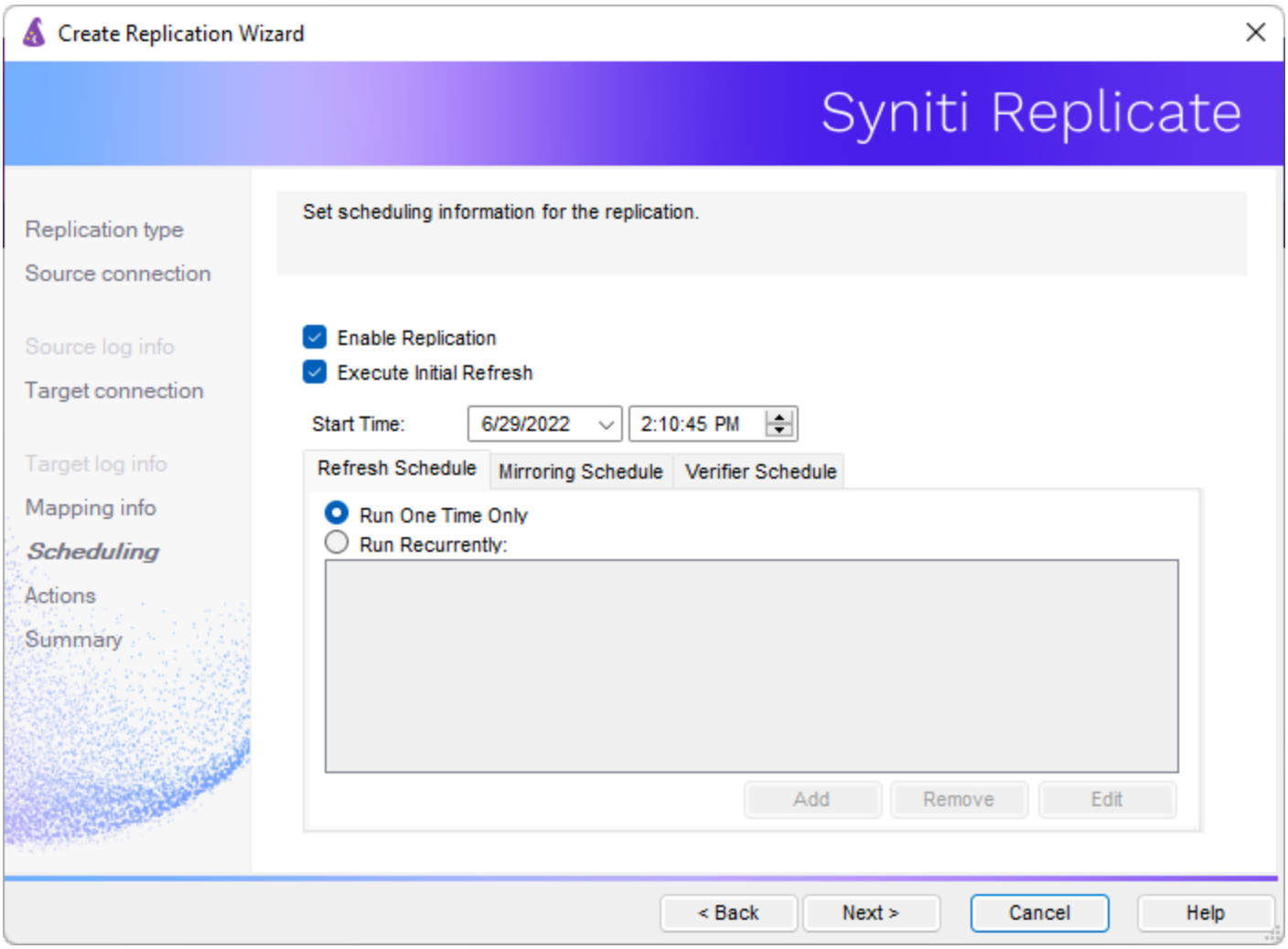
12. Click **Next** to go to the **Select Target Connection** screen.



13. Choose the target connection for text output from the drop-down list that includes all the target connections you have created in Syniti Replicate.
14. Choose the data set you want to replicate from the drop-down list.
    If the drop-down list is empty, exit the wizard and add or create a target data set.
15. Click **Next** to go to the **Set Mapping Info** screen.
    Source columns and target data with the same name are automatically mapped.



16. Click **Next** to go to the **Scheduling** screen.



17. Make sure the **Enable Replication** option is checked. This is required for the replication to run.
18. Set a start time for the replication. The **Start Time** field indicates the time at which the Data Replicator will begin considering the replication for execution.
19. Check the option to **Execute Initial Refresh**.
    A full replication will be performed from the source table to the data file.
20. Click **Next** to go to the **Summary** screen.
21. Click **Finish** to complete the wizard.

Start Replications

If you installed the Replication Agent as a service during setup, you just need to start the service using the ServiceMonitor program in the Windows Notification Area.

- The replication that you have scheduled should start at the specified time.
- Use the Replication Monitor tab in the Management Center to track the progress of the replication.

If you would like to set up the Replication Agent as a service:

- From the ServiceMonitor program  in the Windows Notification Area, choose **Launch Service Installer**.
- Manage the service from the Service Monitor program (located in the Windows Notification Area ).
- Use the Replication Monitor tab in the Management Center to track the progress of the replication.

To run the Replication Agent interactively:

- In the Windows Notification Area, select the Service Monitor icon  .
- From the right mouse button menu, choose **Replication Agent**, then **Start** then **Application**.
  The replication that you have scheduled should start at the specified time.
- Use the Replication Monitor tab in the Management Center to track the progress of the replication.

Stop Replications

Stop the Replication Agent from the Service Monitor in the Windows Notification Area.