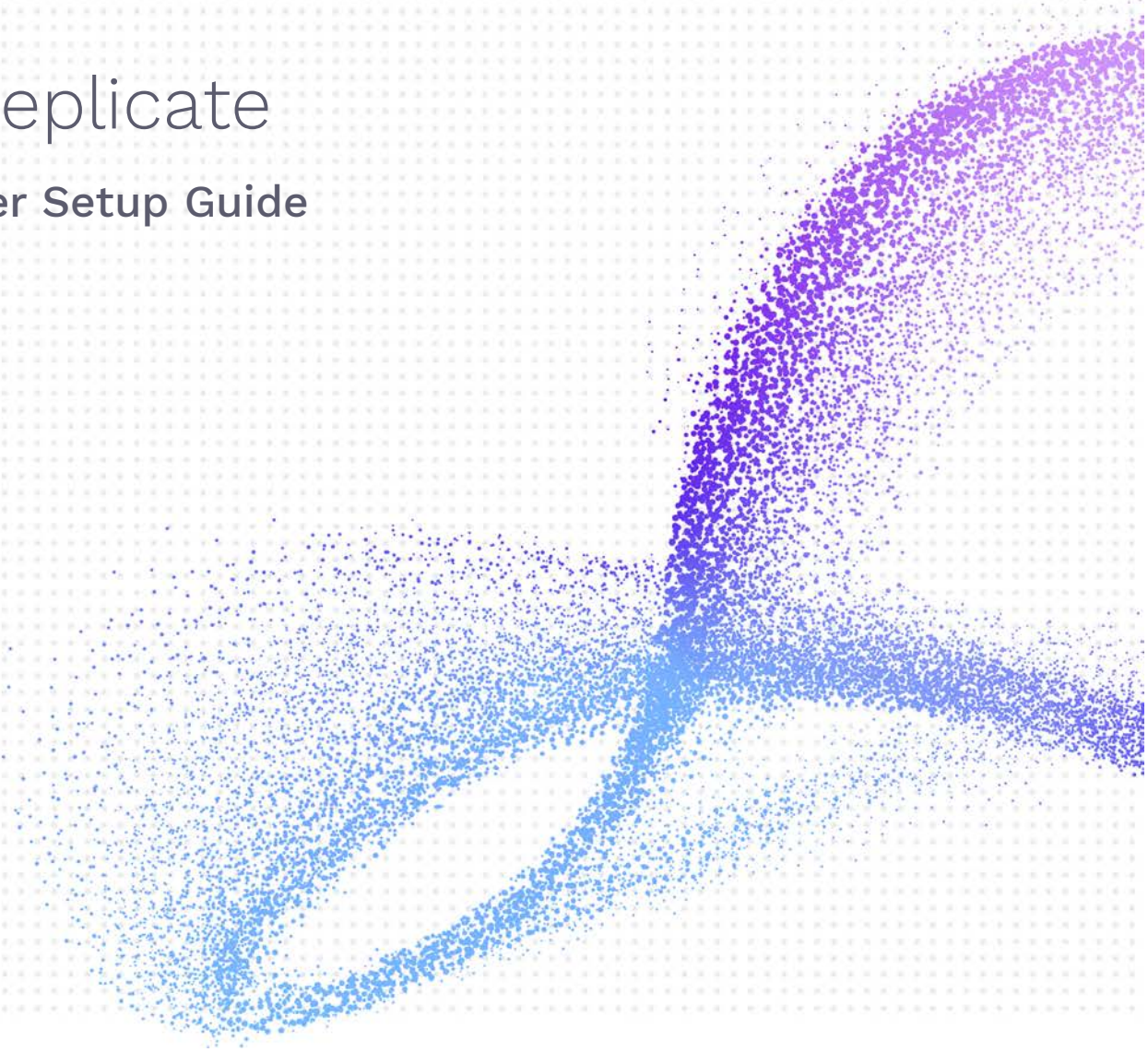
Syniti

Syniti Replicate

XML Provider Setup Guide

Version 10.1



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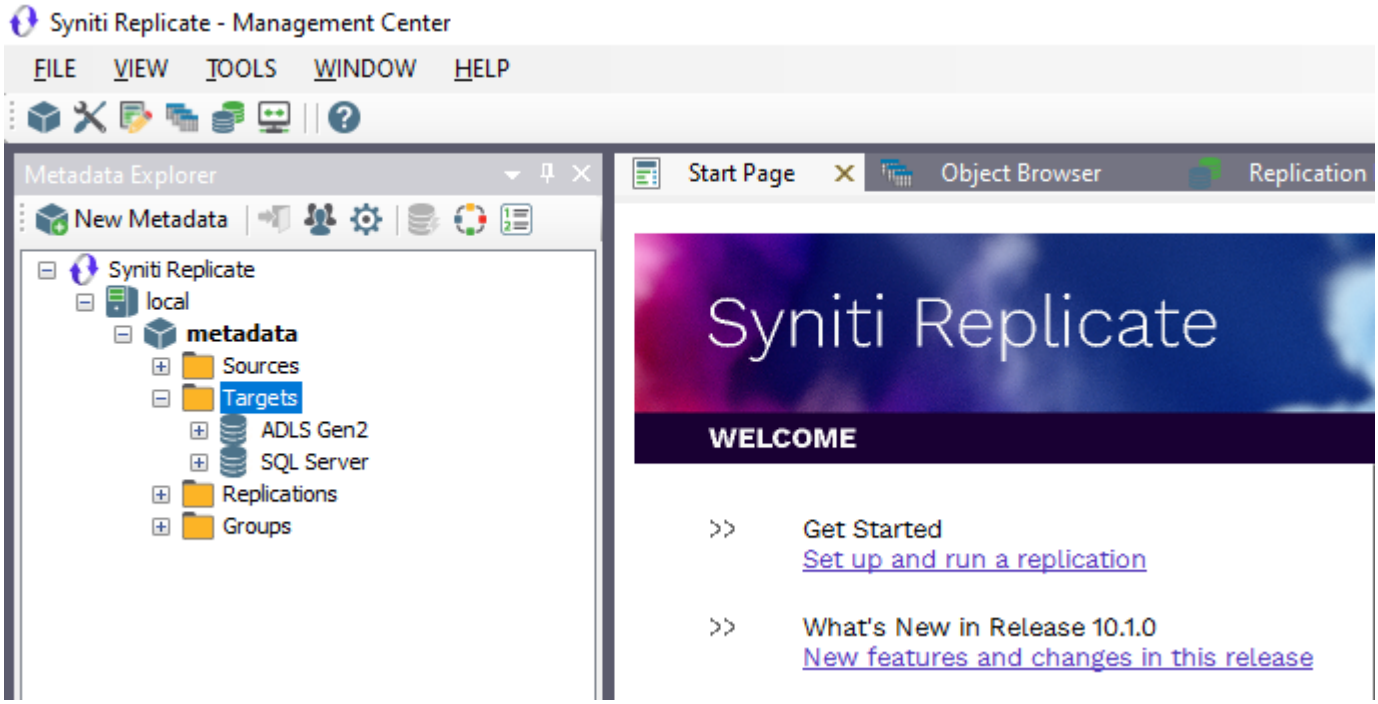
This guide describes how to set up your Syniti Replicate environment to replicate data to XML format files. When replicating **from a relational database to an XML file**, Syniti Replicate allows you to replicate data in two different ways, or modes:

- **Refresh**
  A one-time complete replication from source table to XML file, according to replication settings and scripts. You can control the timing of the replication, identify the columns to be replicated and add scripts to transform data during replication.
- **One-way mirroring**
  A continuous update of a replicated table to a XML file based on changes to the source database that have been recorded in the database server log. You can define the replication settings to check the transaction log on the source database at regular intervals. Any changes found in the log would be applied to the target file.

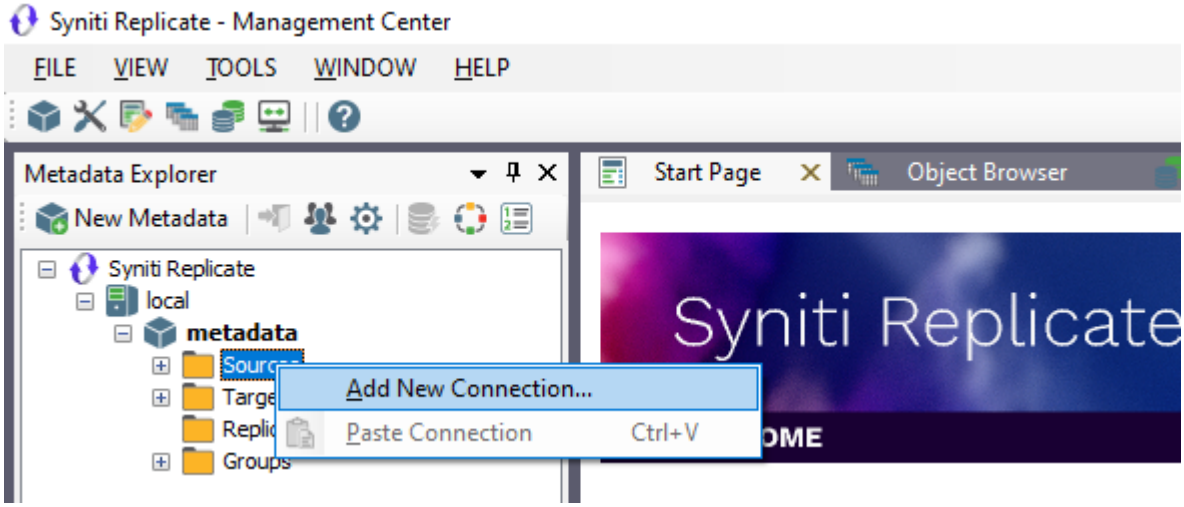
Replicating Data from a Relational Database to an XML File

- Make sure you have database connections via a .NET data provider to the supported databases for source database tables.
- 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.

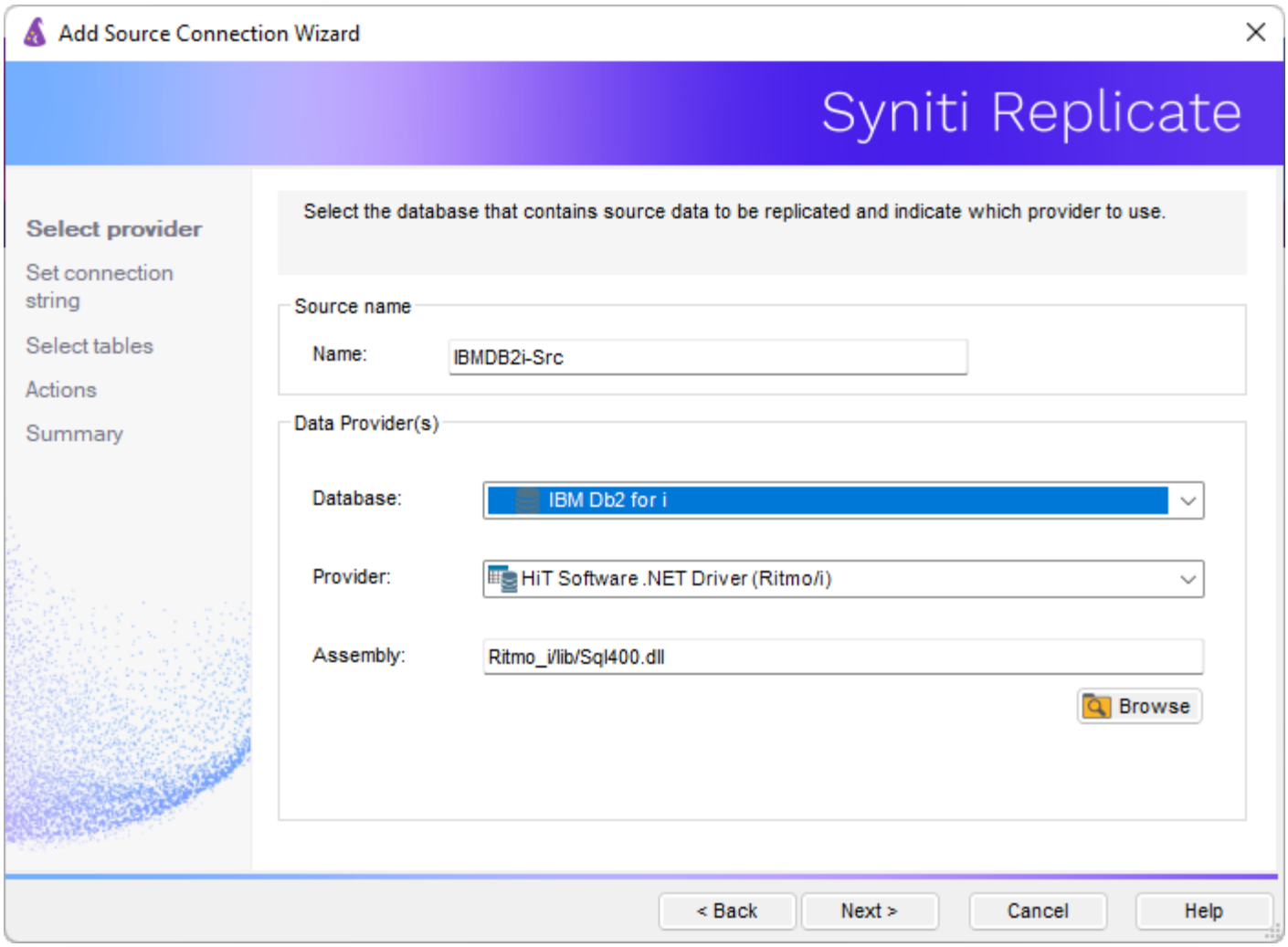


Create a Source Connection

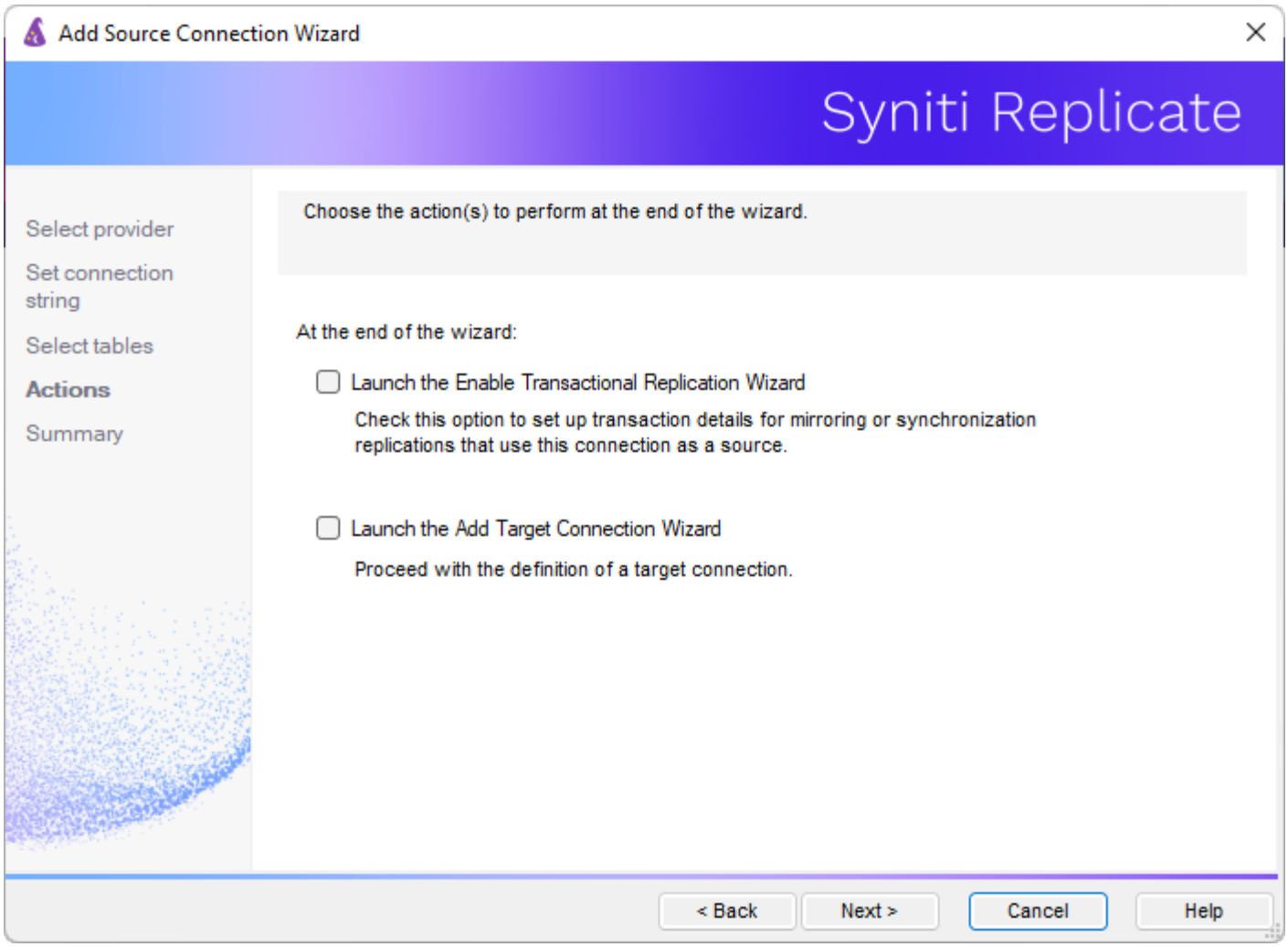
1. In the Metadata Explorer, expand the metadata node to view the **Sources** and **Targets** nodes.
2. Select the **Sources** node.
3. From the right mouse button menu, choose **Add New Connection**.



4. In the Add 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.



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



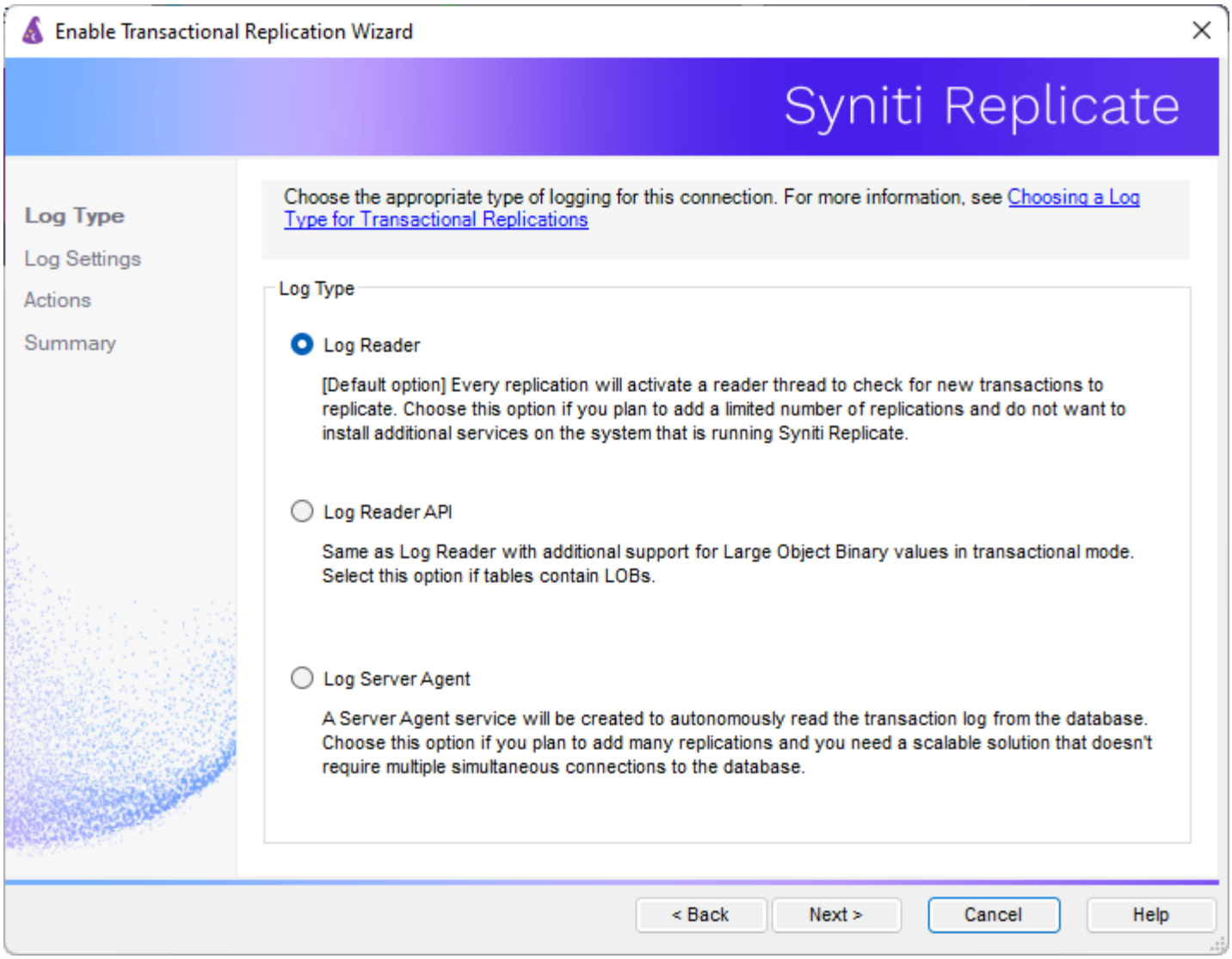
7. Complete the wizard.

Enable Transactional Replication

This section assumes you are planning to replicate data to an XML file 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 help for more information on the best option.

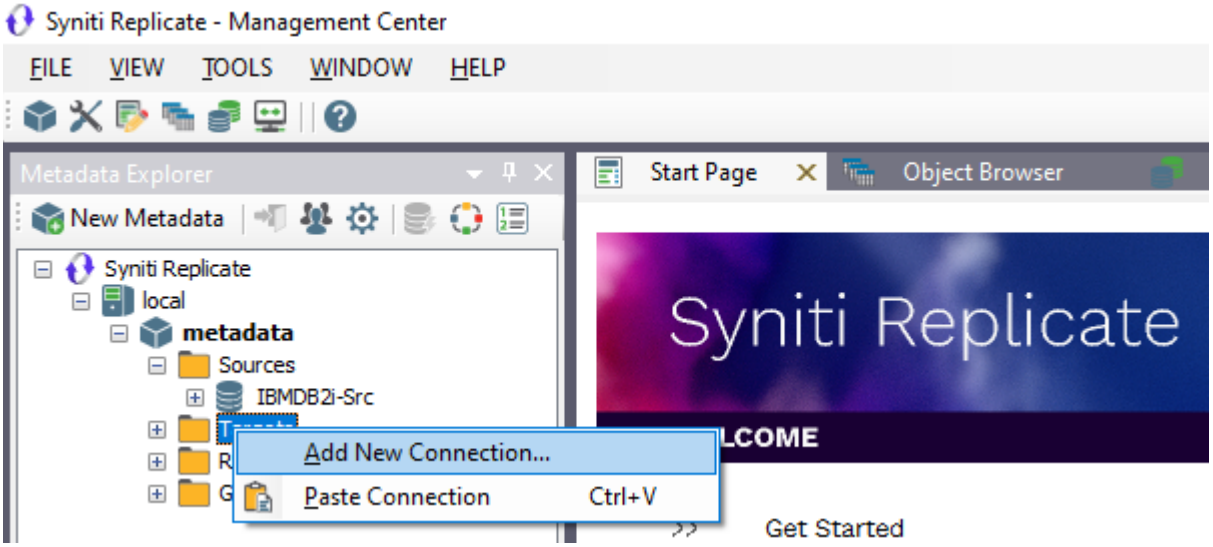


2. Click **Next** to enter the log settings. The fields and appropriate values depend on the database and log type. You can obtain a setup guide for a specific relational database by making a request in the Help Center.
3. Click **Next** to verify your settings against the source connection to the database. 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.

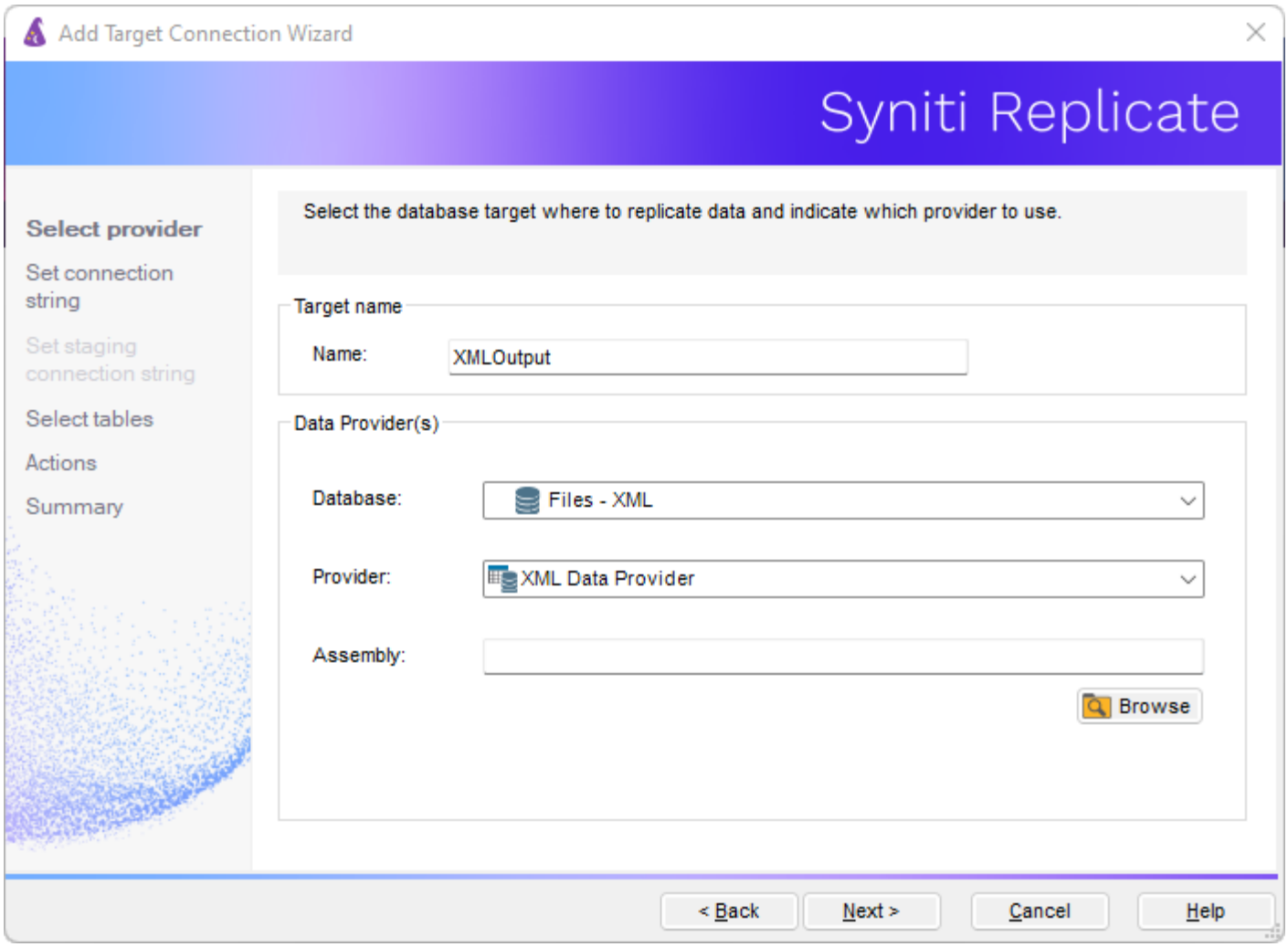
The source connection is now set up for transactional replications.

Set Up Target Connection to an XML File

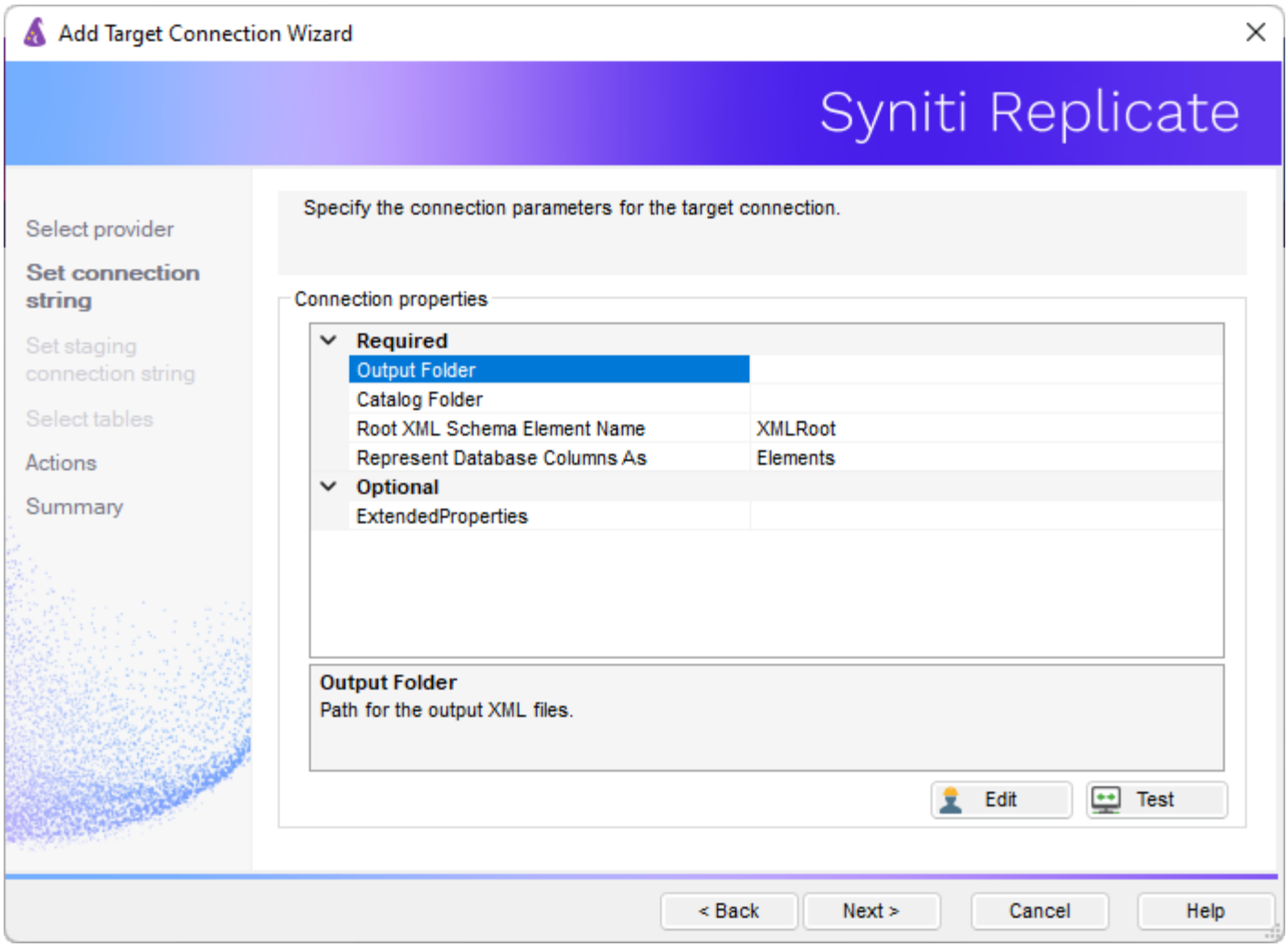
This section assumes you have checked the **Enable Transactional Replication wizard** option to launch the Add Target Connection wizard. If not, to open the wizard from the Management Center, choose **Targets** in the Metadata Explorer, then right-click to choose **Add New Connection...**



1. In the Target Connection Wizard **Provider** field, select the **Files - XML** option.



2. Click **Next** to display the **Set connection string** screen.



3. Set values for properties as follows.

Output Folder	The path to a directory to contain the output files
Catalog Folder	The path to a directory to contain the XSD schema files
Root XML Schema Element Name	The name of the root element of the output XML file
Represent Database Columns As	Choose Element or Attribute to determine how source table columns will be organized in the output XML files. This field sets the default value that will be applied to all the columns of each table in this target connection. When completing the **"Create Target Table Wizard"** (**Define Columns** screen), you can change the value for each column.

4. You can leave the **Extended Properties** field blank.

5. Click **Next** to display the Actions screen.
6. Click **Next** to display the **Summary** page.
7. Click **Finish** to complete the wizard.

The next step is to set up replications from whichever source connection you have defined to the XML target file.

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."

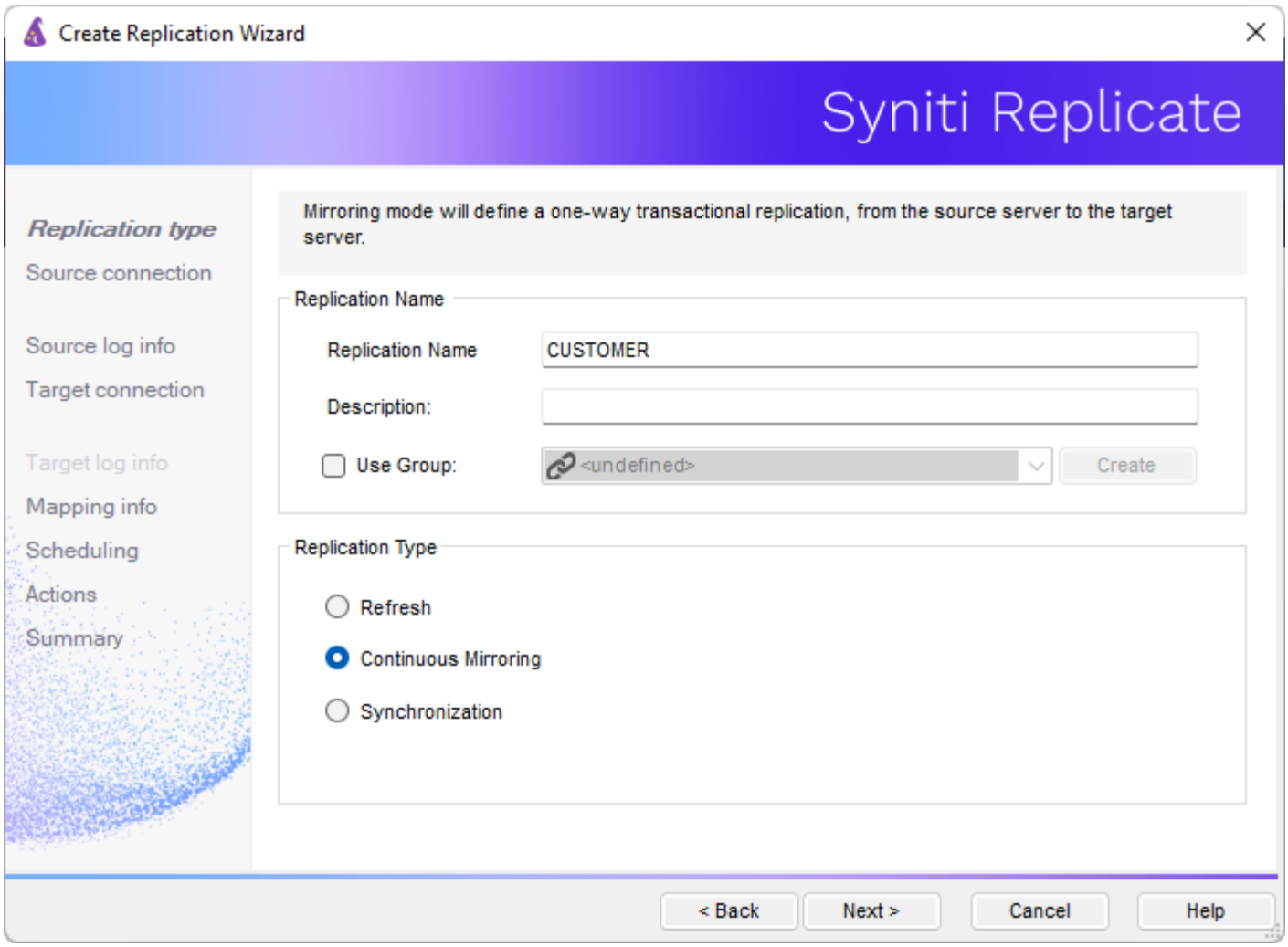
1. In the Metadata Explorer, expand the source connection you created above.
2. Select and drag a source table to the target file connection.
3. The Create Target Table wizard is displayed.
   Although you are not actually creating tables, you can use this wizard to create a representation of the file 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 the XML Column representation for each column.
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 an XML file.

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

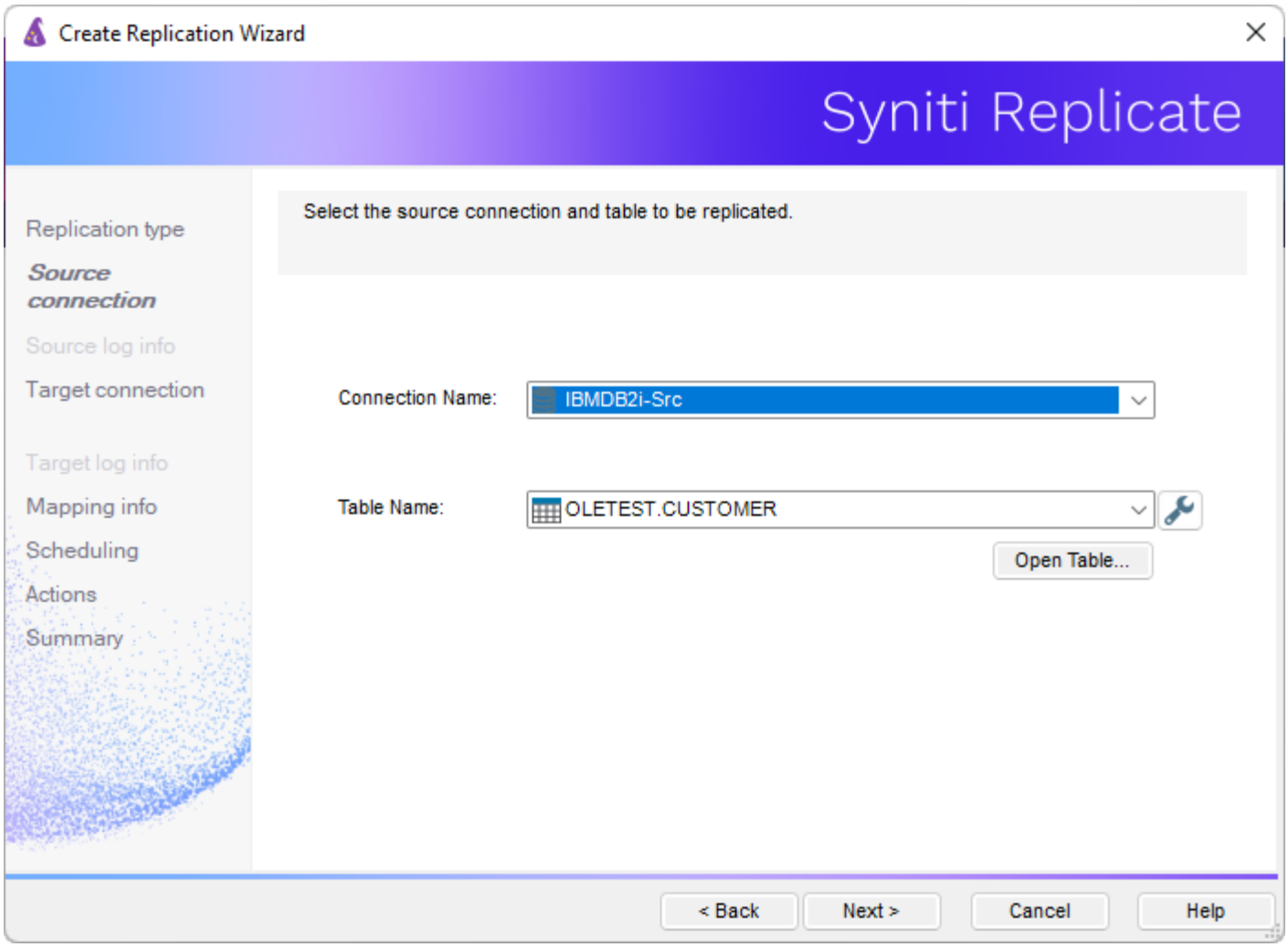
Define the Replication

This section assumes you have checked the Create Replication wizard option to launch the Create Replication wizard. If not, to open the wizard from the Management Center, choose the table you want to replicate in the Metadata Explorer, then right-click to choose **Replication > Create New Replication...**

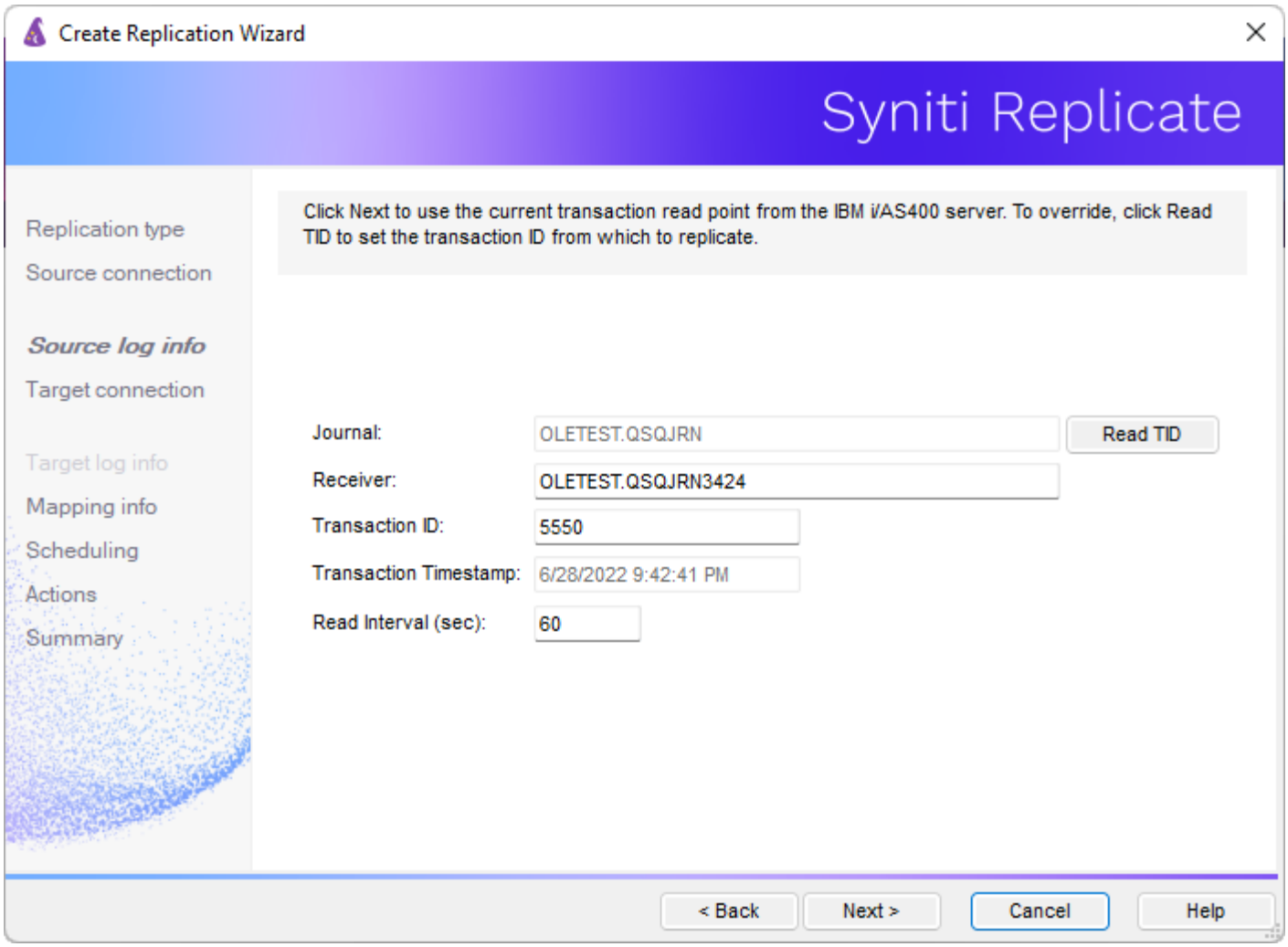
1. In the **Define Replication Type** screen, type a name to identify the replication.
2. Optionally provide a description of the replication.
3. In the Replication Mode area, choose **Continuous Mirroring**.



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



5. Choose the source name from the drop-down list that includes all the source connections you have created in Syniti Replicate.
6. Choose the table that you want to replicate from the drop-down list.
7. If you want more information about the table before proceeding, click **Open Table...**.
8. Click **Next** to go to the **Source Log Info** screen.



The first two fields on this screen depend on the source database you are using. In this explanation, we assume you are using IBM Db2 for i (iSeries or AS/400). Check the help for the Replication Wizard for details on the other databases.

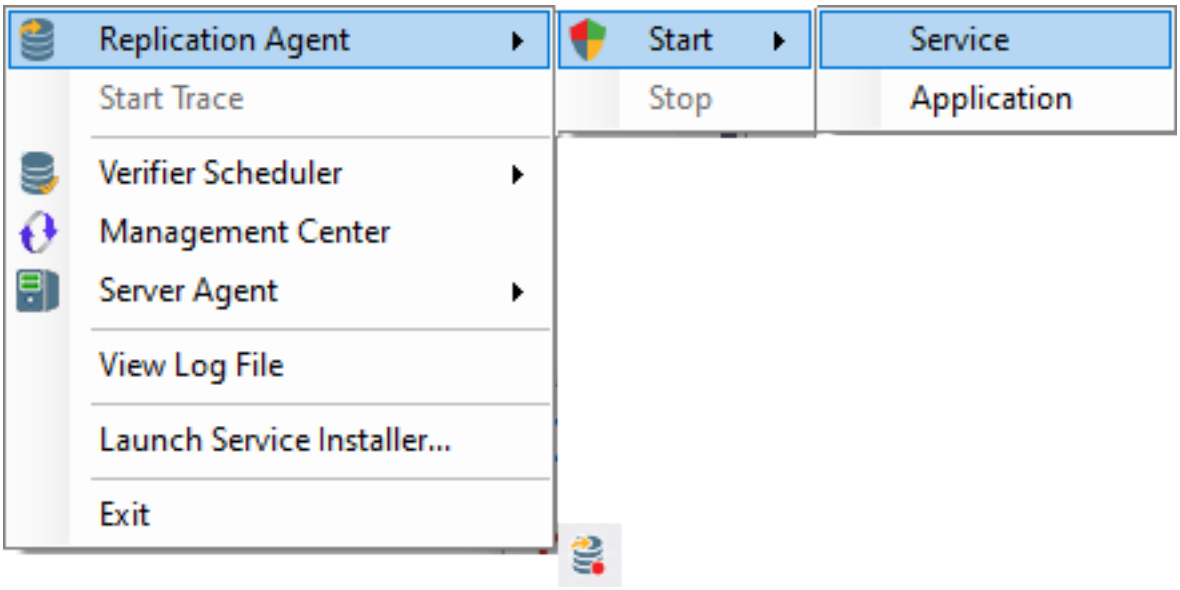
The Journal field is automatically filled in by retrieving the information from Db2 for i. The Receiver field will be automatically filled in after setting the Transaction ID. You do not need to modify these fields. However, if the library that you have specified as a source is not journaled, you will need to ask your system administrator to journal the library.

9. In the Transaction ID field, click **Read** to open the Read Point dialog.
10. Choose either the current transaction or a transaction ID based on a time and date.
11. Click **OK** to add the value to the **Source Log Info** screen.
12. Set the value of the **Read Interval** field to the frequency with which you want Syniti Replicate to check the transaction log for new events to mirror.

13. Click **Next** to go to the **Select Target Connection** screen.
14. Choose the target connection for XML output from the drop-down list that includes all the target connections you have created in Syniti Replicate.
15. 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.
16. Click **Next** to go to the **Set Mapping Info** screen.
    Source columns and target data with the same name are automatically mapped.
17. Set a start time for the replication. The **Start Time** field indicates the time at which the Replication Agent will begin considering the replication for execution.
18. Check the option to **Execute Initial Refresh**.
    A full replication will be performed from the source table to the data file, prior to starting the mirroring process where only incremental changes will be replicated.
19. Go to the Mirroring Schedule tab.
20. Select how you want to run the replication:
    - Run Continuously: the transaction log will be checked for changes to the table using the frequency that you specified on the Set Log Info tab. Any changes will be replicated to the target table.
    - Schedule Interruptions: the replication process will run as above, except for interruptions specified when you click the Schedule button in the Scheduler dialog.
21. Make sure the **Enable Replication** option is checked. This is required for the replication to run.
22. Click **Next** to go to the **Summary** screen.
23. Click **Finish** to complete the wizard.

Run the Replication

If you installed the Replication Agent as a service during setup, you just need to start the service using the Service Monitor 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 install the Replication Agent as a service:

- From the Windows Desktop **Start** menu, choose **Syniti Replicate**, then **Service Installer**.
- Manage the service from Service Monitor program (located in the Syniti Replicate install folder or on the Windows **Start** > **Programs** > **Startup** menu).
- 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.

XML Output Structure

Source table:

Field name	Ordinal	Type	Size	Preci...	Scale	Description	Allow Nulls	Identity	Default Value	Foreign Keys
ID	00	INTEGER	4	10	0		True	False		
FIRSTNAME	01	VARCHAR	50	0	0		True	False		
LASTNAME	02	VARCHAR	50	0	0		True	False		
BIRTHDATE	03	CHARACTER	20	0	0		True	False		
PHONE	04	CHARACTER	15	0	0		True	False		
ADDRESS	05	VARCHAR	50	0	0		True	False		
CITY	06	VARCHAR	50	0	0		True	False		

Target connection settings:

Root XML Schema Element Name = Root

Represent Database Column As = Element

Mapping:

	Field name	Type	Size	Precisi...	Scale	Null	Default value	XML Column Representation
	ID	integer	0	0	0	☑		Attribute
	COLSMALL	byte	0	0	0	☐		Element
	COLBIGINT	long	0	0	0	☐		Element
	COLREAL	float	0	0	0	☐		Element
	COLFLOAT	double	0	0	0	☐		Element
	COLDOUBLE	double	0	0	0	☐		Element
	COLVARCHAR	string	0	0	0	☐		Element
	COLCHAR	string	0	0	0	☐		Element

Refresh Output File

```
<?xml version="1.0"?>
<Root xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <HIT_TEST ID="1">
    <FIRSTNAME>Nancy</FIRSTNAME>
      <LASTNAME>Davolio</LASTNAME>
      <BIRTHDATE>08-Dec-48           </BIRTHDATE>
      <PHONE>(206) 555-9857 </PHONE>
      <ADDRESS>507 - 20th Ave. E.</ADDRESS>
      <CITY>Seattle</CITY>
  </HIT_TEST>
  <HIT_TEST ID="2">
    <FIRSTNAME>Andrew</FIRSTNAME>
    <LASTNAME>Fuller</LASTNAME>
      <BIRTHDATE>19-Feb-52           </BIRTHDATE>
      <PHONE>(206) 555-9482 </PHONE>
      <ADDRESS>908 W. Capital Way</ADDRESS>
      <CITY>Tacoma</CITY>
  </HIT_TEST>
</Root>
```

Mirroring Output File

During mirroring, a new XML element named TRX is added around each *Table Name* XML Element. This element contains the following XML attributes, which describe transaction information.

OpType	Operation type with one of the following values: I: Insert UB: Update Before UA: Update After D: Delete

TID	Transaction ID
TTS	Transaction time stamp
UID	User ID

The output example below shows the INSERT, UPDATE and DELETE of one record.

```
<?xml version="1.0"?>
<Root xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <TRX OpType="I" TID="101" TTS="4/23/2019 11:31:29 AM" UID="DB2ADMIN">
  <HIT_TEST ID="0">
    <FIRSTNAME>Epsal</FIRSTNAME>
    <LASTNAME>Aerdna</LASTNAME>
      <BIRTHDATE>20-Apr-71           </BIRTHDATE>
      <PHONE>(408) 345-4001 </PHONE>
      <ADDRESS>4020 Moorpark A. Suite 100</ADDRESS>
      <CITY>San Jose</CITY>
  </HIT_TEST>
 </TRX>


<TRX OpType="UB" TID="102" TTS="4/23/2019 11:31:31 AM" UID="DB2ADMIN">
  <HIT_TEST ID="0">
    <FIRSTNAME>Epsal</FIRSTNAME>
    <LASTNAME>Aerdna</LASTNAME>
      <BIRTHDATE>20-Apr-71           </BIRTHDATE>
      <PHONE>(408) 345-4001 </PHONE>
      <ADDRESS>4020 Moorpark A. Suite 100</ADDRESS>
      <CITY>San Jose</CITY>
  </HIT_TEST>
</TRX>
<TRX OpType="UA" TID="102" TTS="4/23/2019 11:31:31 AM" UID="DB2ADMIN">
  <HIT_TEST ID="0">
    <FIRSTNAME>Epsal</FIRSTNAME>
    <LASTNAME>Aerdna</LASTNAME>
      <BIRTHDATE>20-Apr-71           </BIRTHDATE>
      <PHONE>(408) 345-4001 </PHONE>
      <ADDRESS>4020 Moorpark A. Suite 100</ADDRESS>
      <CITY>Verona</CITY>
  </HIT_TEST>
</TRX>
```

```
<TRX OpType="D" TID="103" TTS="4/23/2019 11:31:33 AM" UID="DB2ADMIN">
  <HIT_TEST ID="0">
    <FIRSTNAME>Epsal</FIRSTNAME>
    <LASTNAME>Aerdna</LASTNAME>
      <BIRTHDATE>20-Apr-71           </BIRTHDATE>
      <PHONE>(408) 345-4001 </PHONE>
      <ADDRESS>4020 Moorpark A. Suite 100</ADDRESS>
      <CITY>Verona</CITY>
  </HIT_TEST>
</TRX>
</Root>
```