Syniti

Syniti Replicate

Azure Event Hubs Setup Guide

Version 10.1

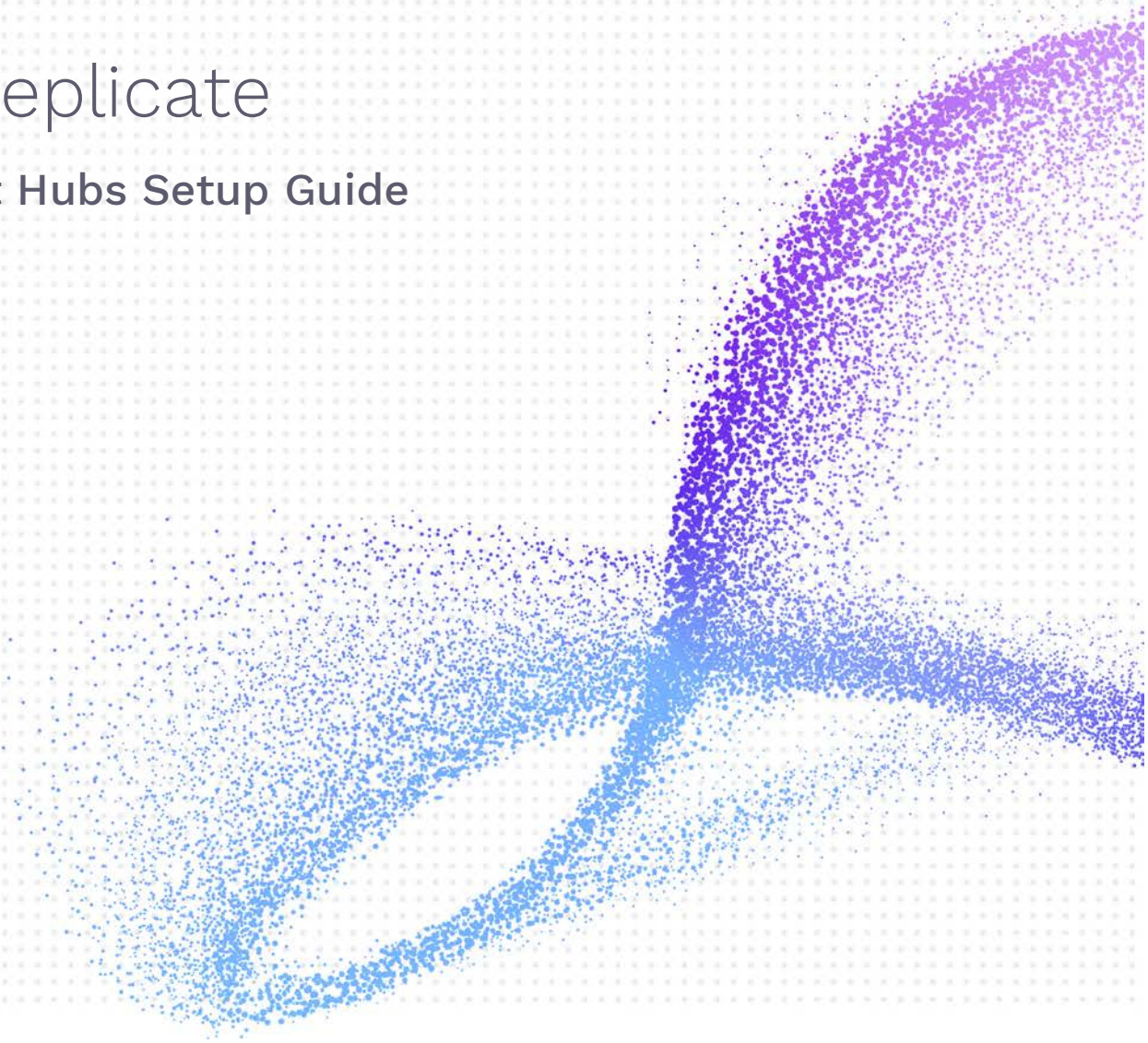

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Table of Contents

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Introduction

Syniti Replicate allows you to replicate data from relational database tables to Azure Event Hubs, a big data streaming platform and event ingestion service, using:

- **Refresh**, or **Snapshot**, replication: a one-time complete replication from any major relational database source to Azure Event Hubs 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 Azure Event Hubs as a target, according to replication settings and scripts.

In order to replicate data in Syniti Replicate to an Azure Event Hub, the data is organized as virtual tables (with columns and data types). You can create a target table and define a replication to an Event Hub "target table", applying mappings and expression logic as with other relational data sources. The Azure Event is built using a JSON, CSV or XML serialization of the entire record, including metadata information such as the actual table name and the operation (Insert, Update or Delete), transactional information like transaction ID and timestamp, and finally the entire image (before and after) of the record. Every replication must be associated with an Event Hub so that Syniti Replicate can determine where to publish the event.

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.

Basic Configuration Steps

Use Syniti Replicate Management Center to:

- Create source connections to RDBMS tables
- Create Azure Event Hubs targets
- Map RDBMS sources to Azure Event Hubs targets
- Enable replication

Subsequent data management on the Azure Event Hubs side depends upon your application needs.

Connection Type

WindowsAzure.ServiceBus version 6.2

1. Download the provider from the nuget site:
   `https://www.nuget.org/packages`
2. Search for **WindowsAzure.ServiceBus** version 6.2.
3. Click **Download package** on the right side of the page.
4. Download the nuget.exe command line tool (file name: nuget.exe):
   `https://www.nuget.org/downloads`
5. From a dos prompt with admin permissions, execute the following command. Be sure to insert the correct WindowsAzure.ServiceBus version.
   ```
   nuget install WindowsAzure.ServiceBus -Version 6.2.0 -Framework net480 -
   OutputDirectory C:/Temp/AzureHubs
   ```
   The command will download the entire provider into the specified output directory.

6. Open the output directory to view the folders where the assemblies are located.
7. Select the following assemblies.

   ```
   Microsoft.Azure.Services.AppAuthentication.1.0.3\lib\net452\Microsoft.Azure.Services.AppAuthentication.dll

   Microsoft.IdentityModel.Clients.ActiveDirectory.3.14.2\lib\net45\Microsoft.IdentityModel.Clients.ActiveDirectory.dll

   Microsoft.IdentityModel.Clients.ActiveDirectory.3.14.2\lib\net45\Microsoft.IdentityModel.Clients.ActiveDirectory.Platform

   Microsoft.IdentityModel.JsonWebTokens.6.7.1\lib\net461\Microsoft.IdentityModel.JsonWebTokens.dll

   Microsoft.IdentityModel.Logging.6.7.1\lib\net461\Microsoft.IdentityModel.Logging.dll

   Microsoft.IdentityModel.Tokens.6.7.1\lib\net461\Microsoft.IdentityModel.Tokens.dll

   Microsoft.Rest.ClientRuntime.2.3.20\lib\net461\Microsoft.Rest.ClientRuntime.dll

   Newtonsoft.Json.6.0.8\lib\net45\Newtonsoft.Json.dll

   System.IdentityModel.Tokens.Jwt.6.7.1\lib\net461\System.IdentityModel.Tokens.Jwt.dll

   WindowsAzure.ServiceBus.6.2.0\lib\net462\Microsoft.ServiceBus.dll
   ```

8. Copy these files into the Plugins/AzureEventHubs folder.

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.

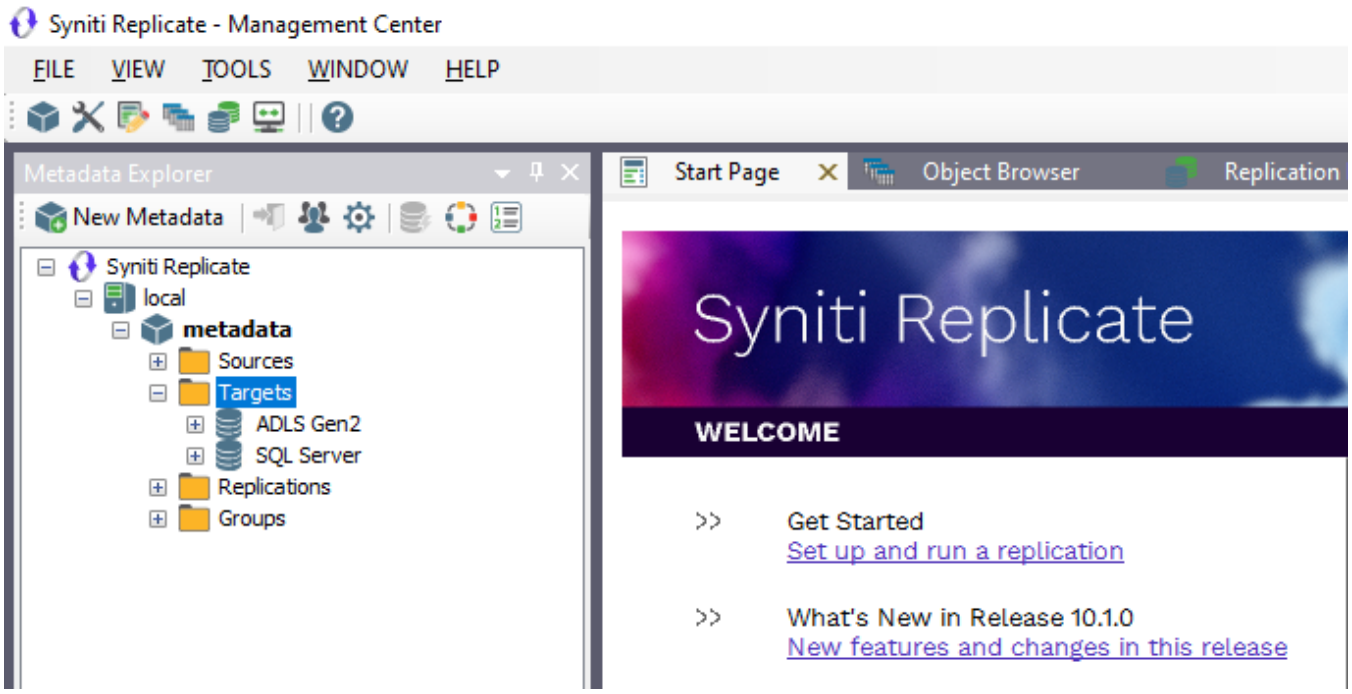
Download and Install Syniti Replicate	The Knowledge Platform Product Suites article acts as a hub to point to various resources. To download and/or register Syniti Replicate, log in to the support site, then click the relevant link in the Replicate section of the article. • Syniti Knowledge Base • Enter a generic support ticket
Install .NET Provider	Download and install the nuget package WindowsAzure.ServiceBus version 6.2
Syniti Replicate Setup (See Steps for Replicating Tables below)	In the Syniti Replicate Management Center: 1. In the Metadata Explorer, create a source connection to your RDBMS. 2. Create a target connection using the Azure Event Hubs option in the **Database** field. 3. Create a replication.
Start Replicating (See Start Replications below)	In the Syniti Replicate Service Monitor: 1. Start the Replication Agent.

Syniti Replicate support for replicating relational data to Azure Event Hubs 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 Azure Event Hubs environment. Check the Help Center for the latest list of supported databases.

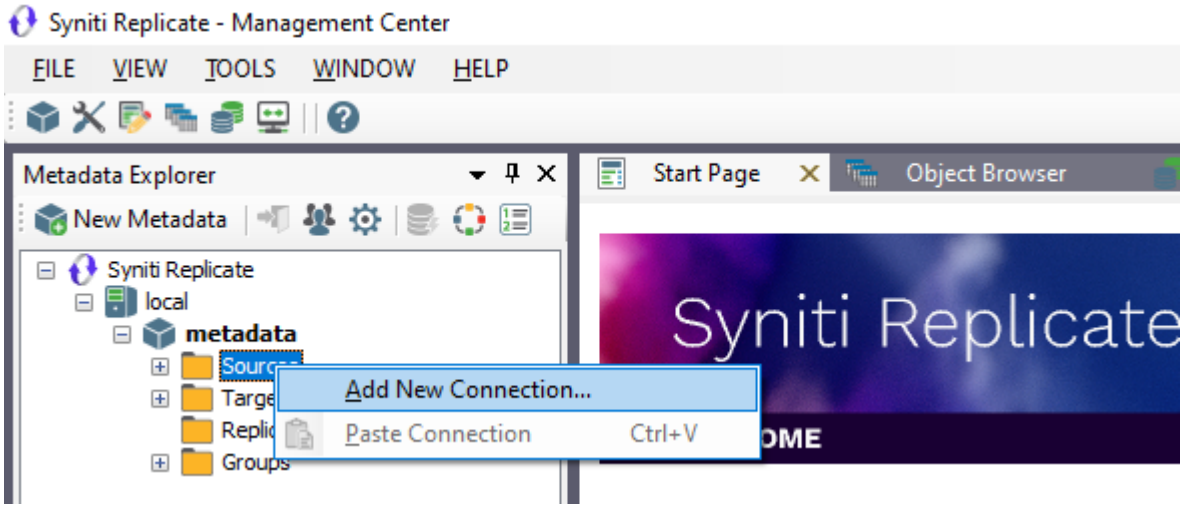
1. Set Up a Source Connection to a Relational Database

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 Syniti Technical Support for specific requirements for your database.
2. Start the 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.

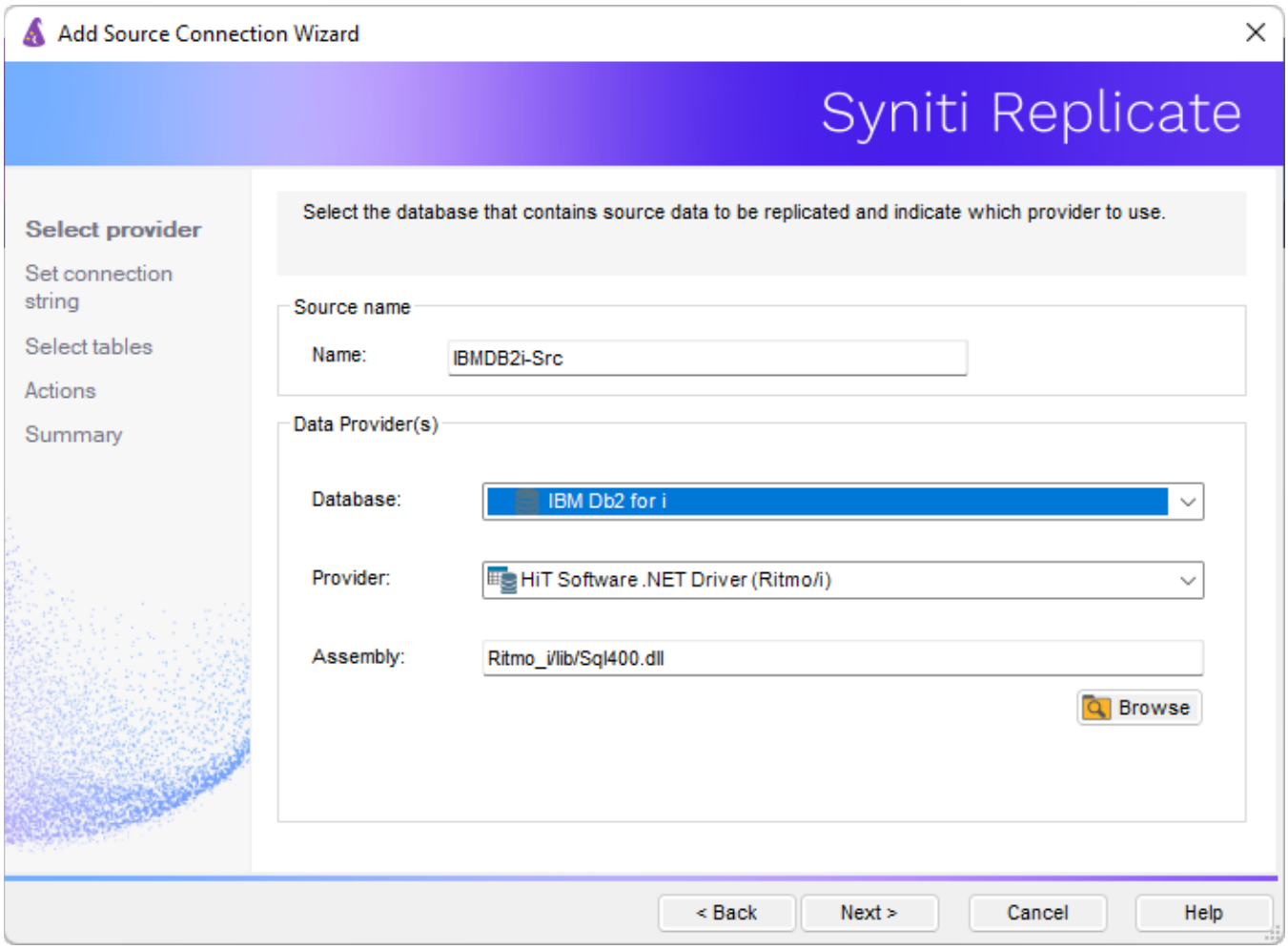


3. In the Metadata Explorer, expand the metadata node to view the **Sources** and **Targets** nodes.
4. Select the **Sources** node.

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



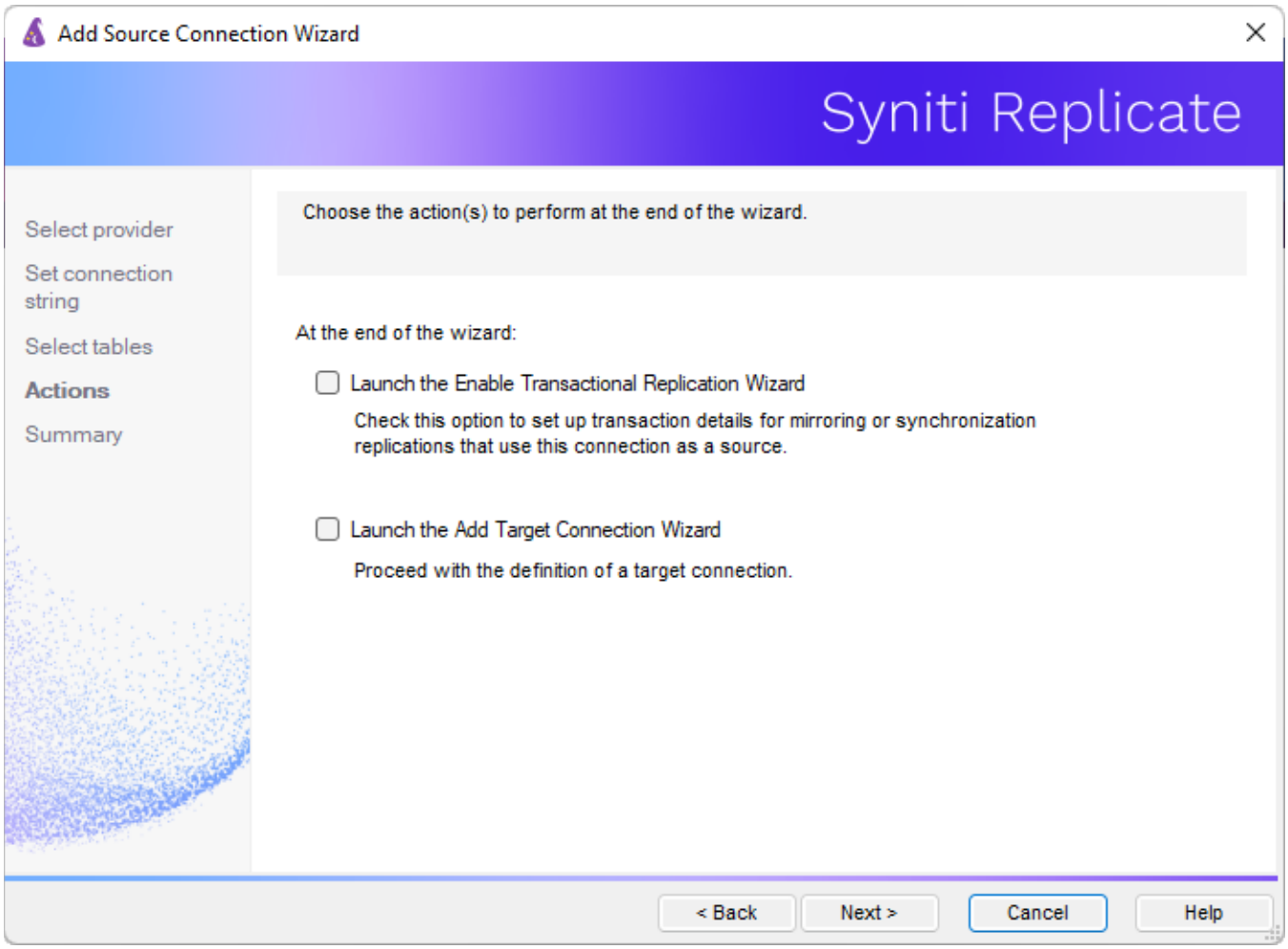
6. In the Source Connection Wizard, follow steps to add a connection string and test the connection to the database.
7. Check the User's Guide **Database Access Providers and Supported Databases** page to verify what value to enter in the **Assembly** field.



8. 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.
9. In the **Setup Info** screen, click **Next** without completing any fields. This screen is used specifically for transactional replications, not refresh or snapshot replications.
10. Choose the tables that you plan to replicate.
11. If using Refresh mode to replicate data to Azure Event Hubs, in the **Actions** screen, check the option **Launch the Add Target Connection Wizard**.

    -OR-
    If using Mirroring mode to replicate data to Azure Event Hubs, in the **Actions** screen, check the option **Launch the Enable Transactional Replication Wizard**.



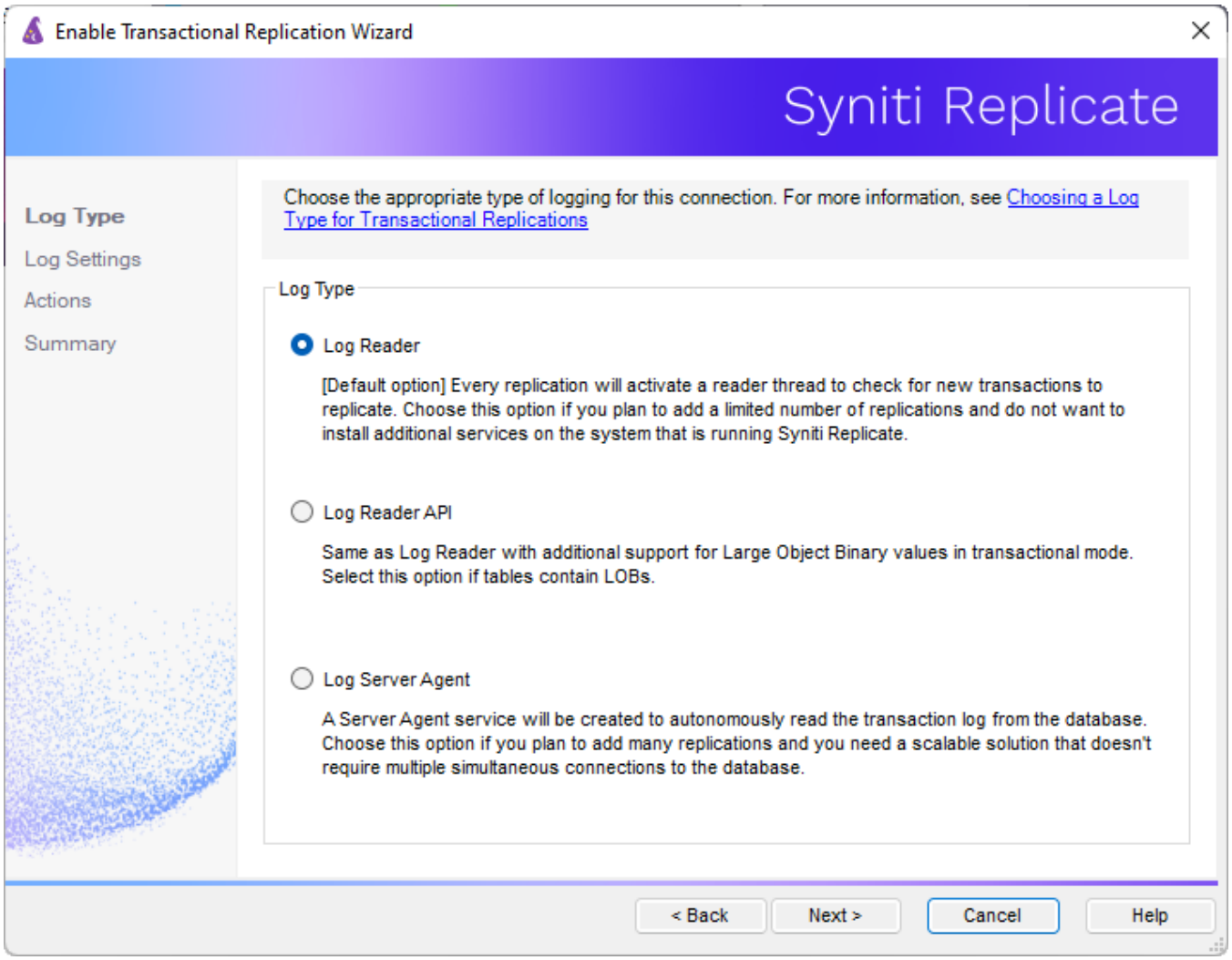
2. Configure the Enable Transactional Replication Wizard

Skip this section if you are setting up a Refresh replication. Continue here if you are setting up a Mirroring replication.

This section assumes you have checked the Source Connection wizard option to launch the Enable Transactional Replication wizard. 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.)



2. Click **Next** to enter the log settings. The fields and appropriate values depend on the database and log type. Submit a request in the Help Center to obtain a Setup Guide for your database.
3. All Log Server Agent setups require the following Agent Settings to establish details for the Windows service and log files:

   Log Files Folder
   An existing folder where all the intermediate binary logs files are written. The folder is also used to contain trace files.
   Prefix
   A prefix for all files created in the folder. This provides easy identification and management of files associated with your connection. The primary purpose for the prefix is to support the case when you configure more than one connection to use the same folder. In general, however, it is advisable to use different folders for different connections.
   Log File Size

The maximum size of each binary log file in megabytes.

Keep Max Files

The maximum number of binary log files to keep. Combined with the log file size, this number needs to be large enough to make sure that all the files are read by Syniti Replicate before they get deleted.

Trace

Unchecked by default. When checked, enables tracing for diagnostics and problem reporting. Trace files are saved in the Log Server folder.

Windows Service Name

Prefix:

This value is provided and cannot be changed It allows you to easily identify the service in the Microsoft Windows Services tool.

Name:

Specify a unique name for the Windows service. Each connection runs its own instance of the Log Server as a Windows service.

Start service after completing the wizard:

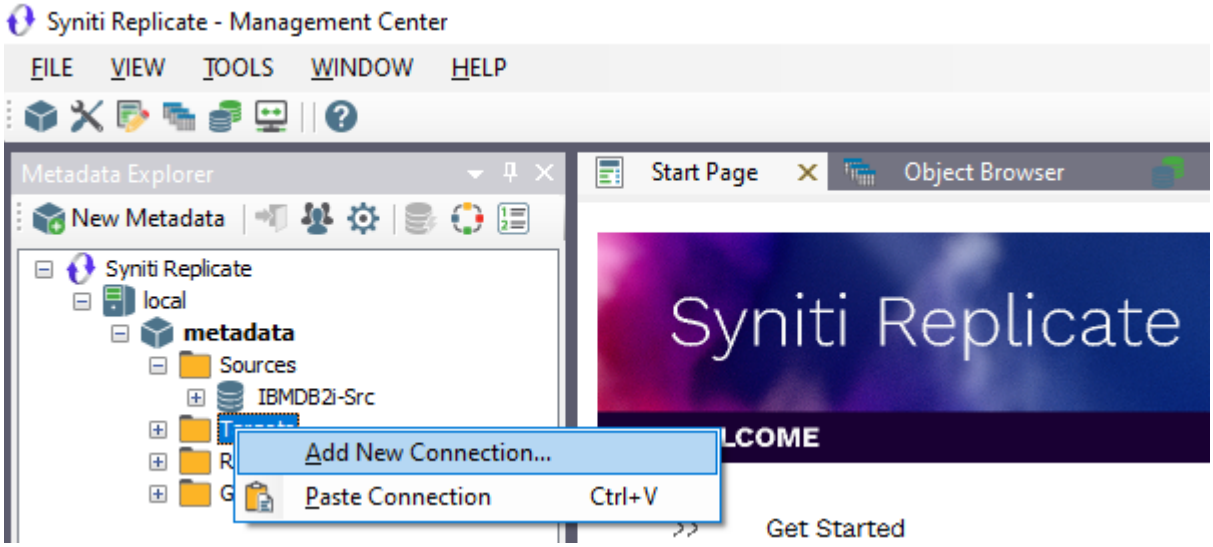
When checked, starts the service automatically after you click **Finish** to complete the wizard.

4. 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.
5. In the **Actions** screen, check the option to launch the Add Target Connection wizard.
6. Click **Next** to review your changes.
7. Click **Finish** to complete the wizard.

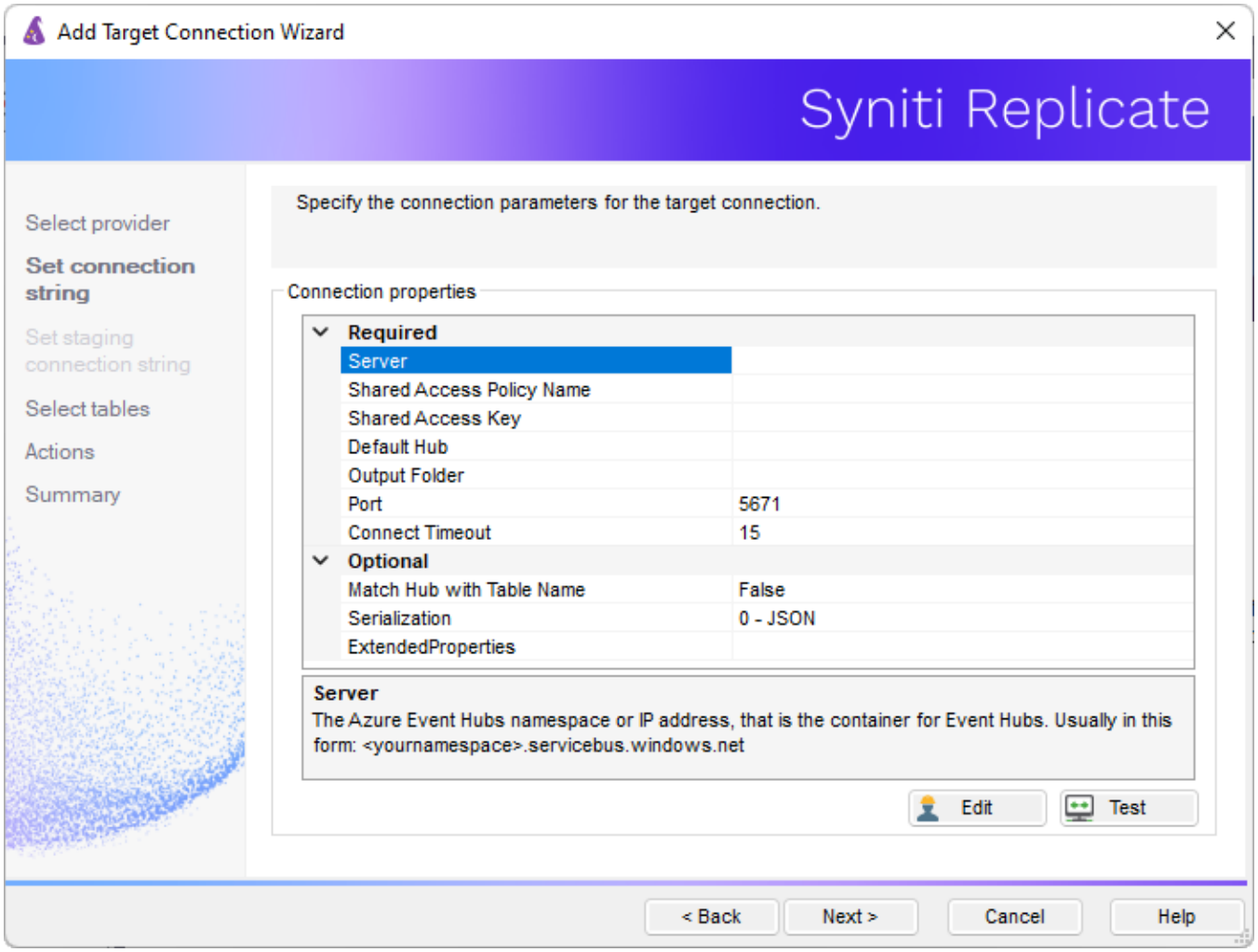
The source connection is now set up for transactional replications.

3. Set up a Target Connection to Azure Event Hubs

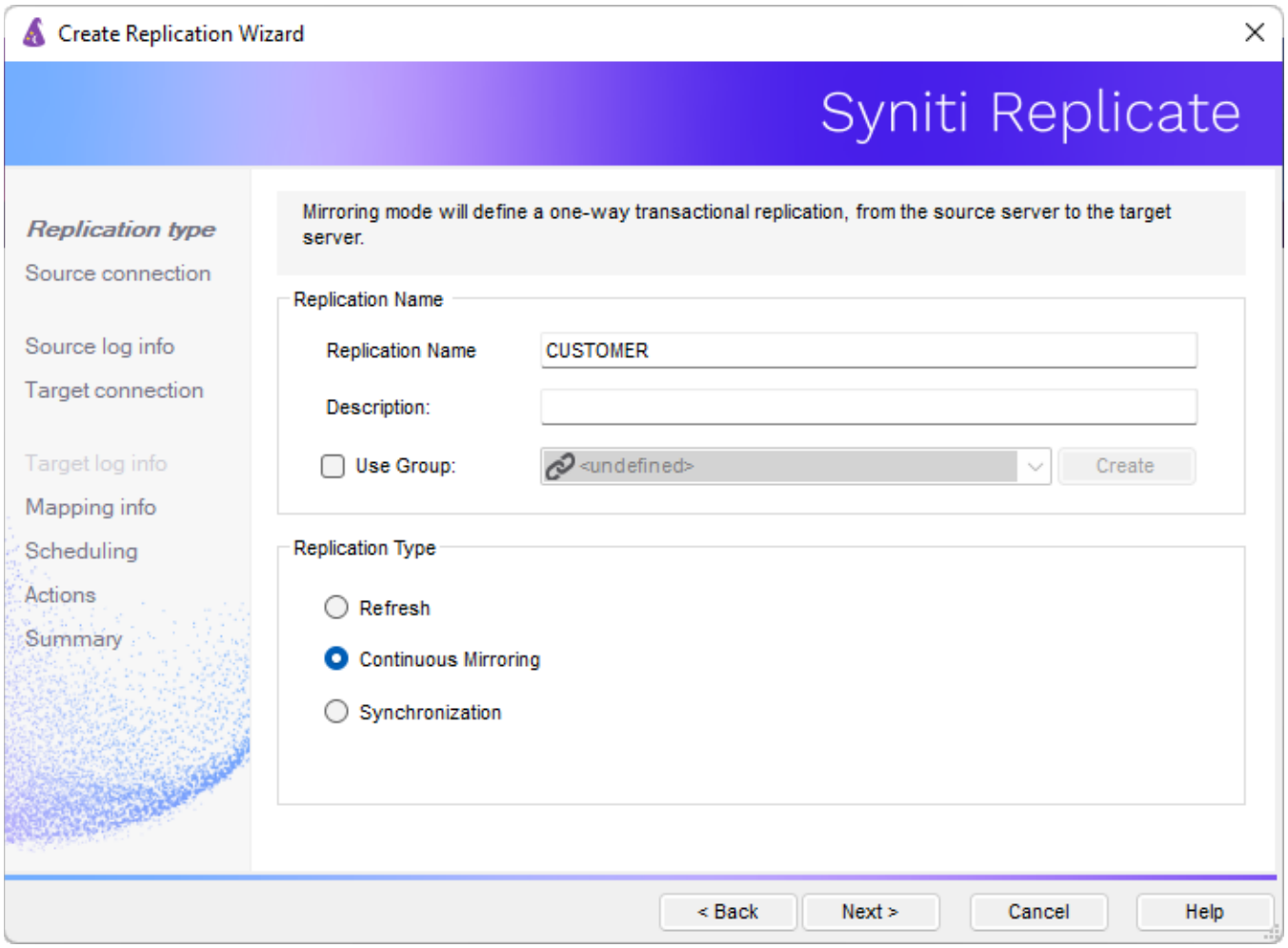
1. Select the **Targets** node.
2. From the right mouse button menu, choose **Add New Connection**.



3. In the Add Target Connection Wizard **Database** field, select the Azure Event Hubs option. The **Provider** and **Assembly** fields are automatically filled out for you.



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



Server	The Azure Event Hubs namespace or IP address, i.e., the container for Event Hubs. Typical format: <yournamespace>.servicebus.windows.net
Shared Access Policy Name	The name of your shared access policy. The default value is RootManageSharedAccessKey.
Shared Access Key	Shared access primary key.
Default Hub	The Event Hub name for the initial connection. If you select the option **Match Hub with Table Name**, each replication will connect to a hub with the matching table name.
Output Folder	Pathname to folder that will contain information related to the replication process.

Port	The port number. The default value is 5671.
Connect Timeout	The connection timeout (in seconds).
Match Hub with Table Name	If set to true, each replicated table will send data to the existing hub with the same table name.
Serialization	Select the type of serialization required for Azure Event Hubs messages. The following types of message serialization are currently supported: 0 – JSON 1 – CSV 2 – XML

5. Click **Next** to display the **Select tables** page.
   At this point, there is no 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.

3. Add Table Information to the Target Connection

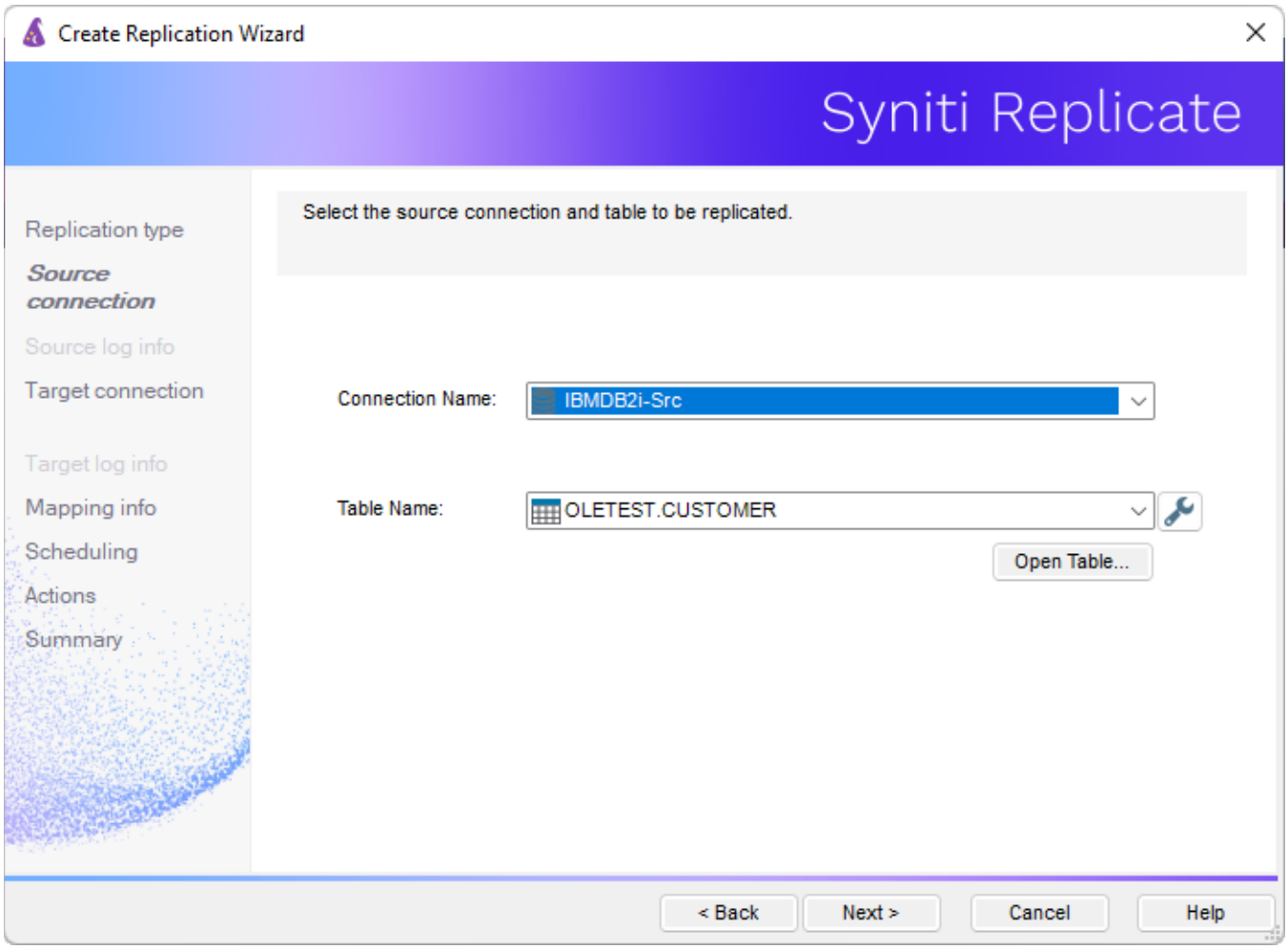
The target connection is displayed in the Metadata Explorer, but you still need to add the file representation for source table data so that when you create replications below, you can specify a source table and target "file."

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 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.

4. Define Replications

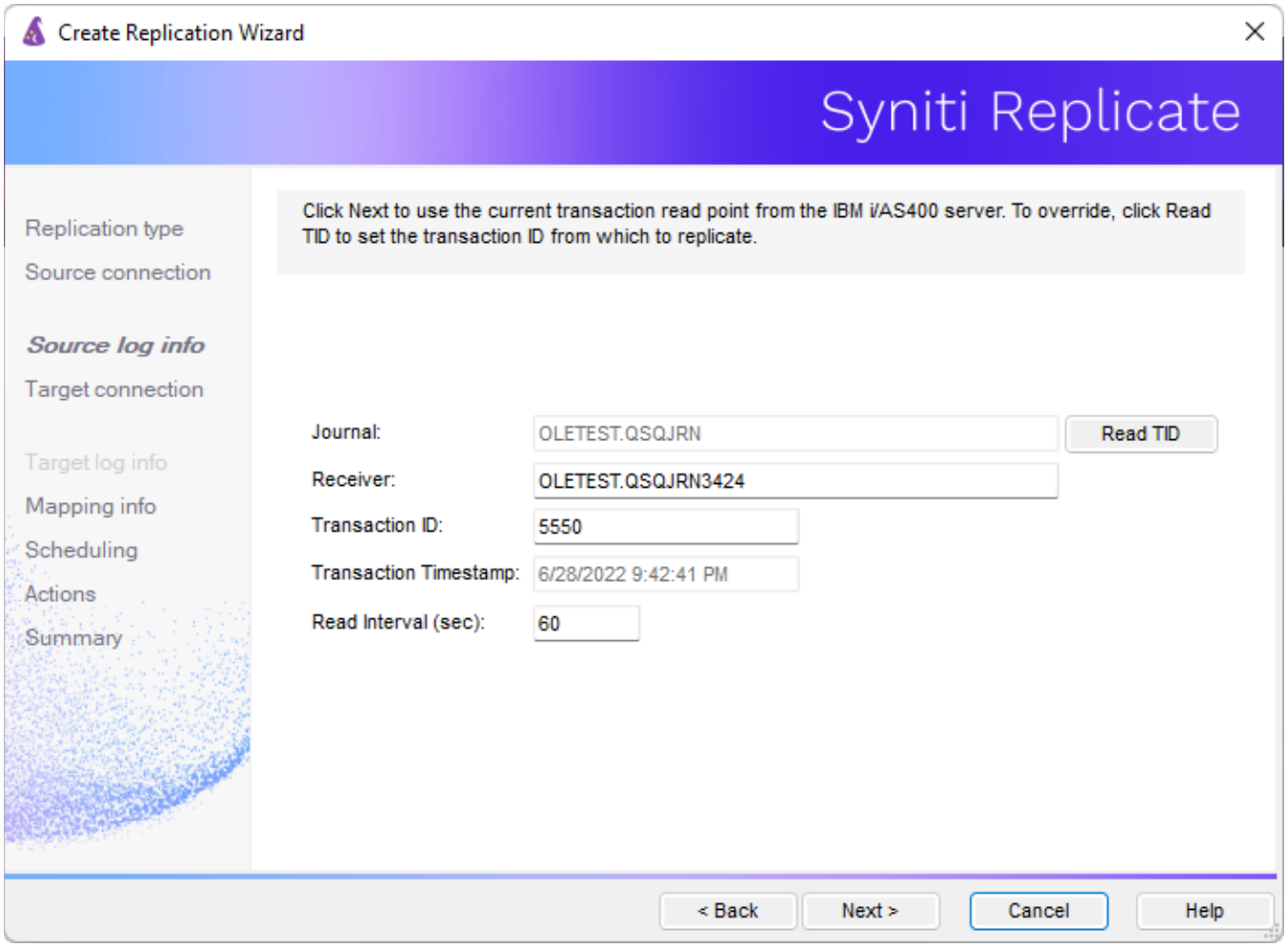
1. Expand the Metadata Explorer tree to display the table that contains the data you want to replicate.
2. Select the table.
3. From the right mouse button menu, choose Replication then Create New Replicaton....
4. In the Define Replication Type screen, type a name to identify the replication.
5. Optionally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



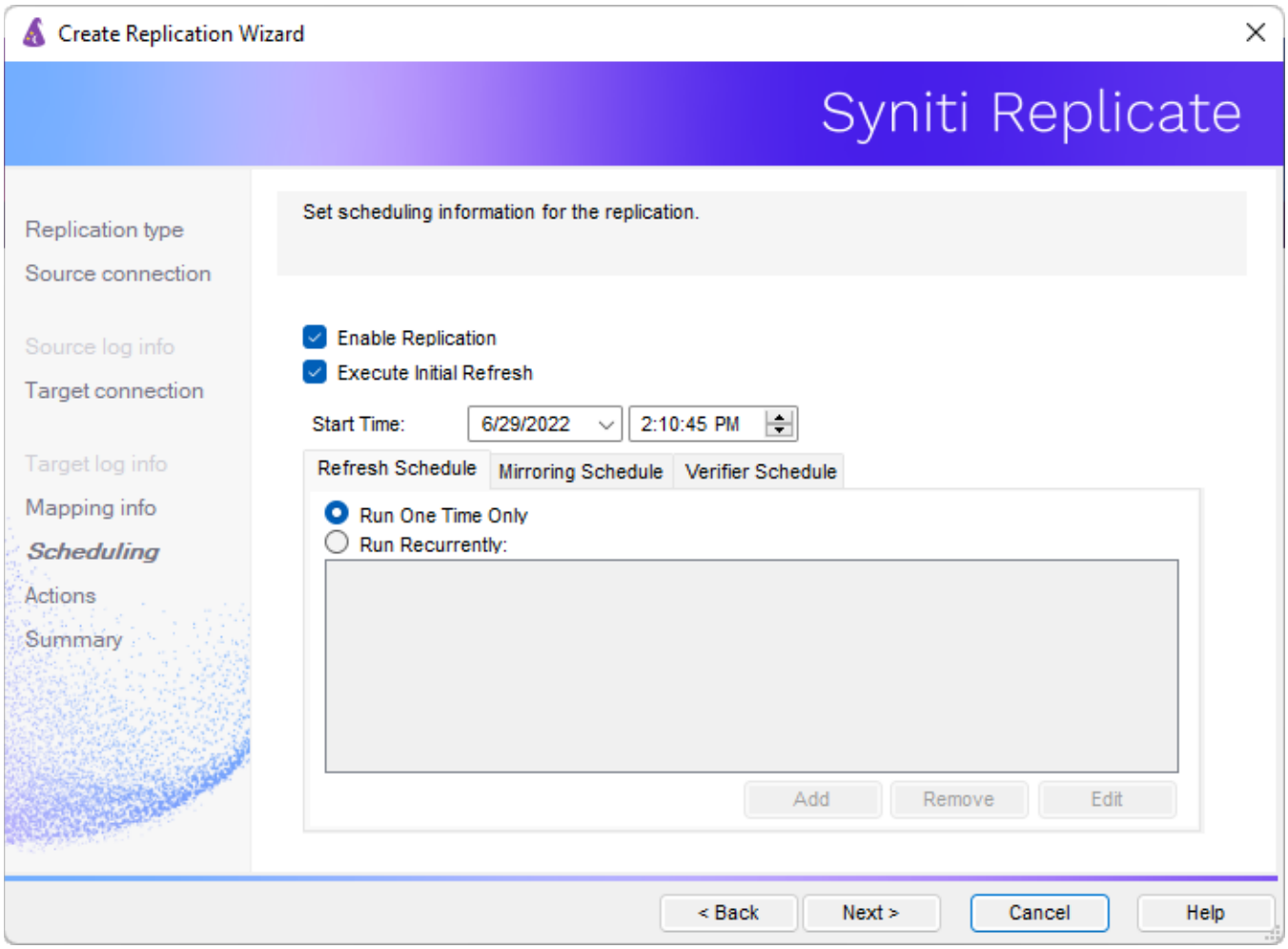
7. Click **Next** to go to the **Select Source Connection** screen.

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.
    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 Azure Event Hubs 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 Syniti Replicate 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 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.