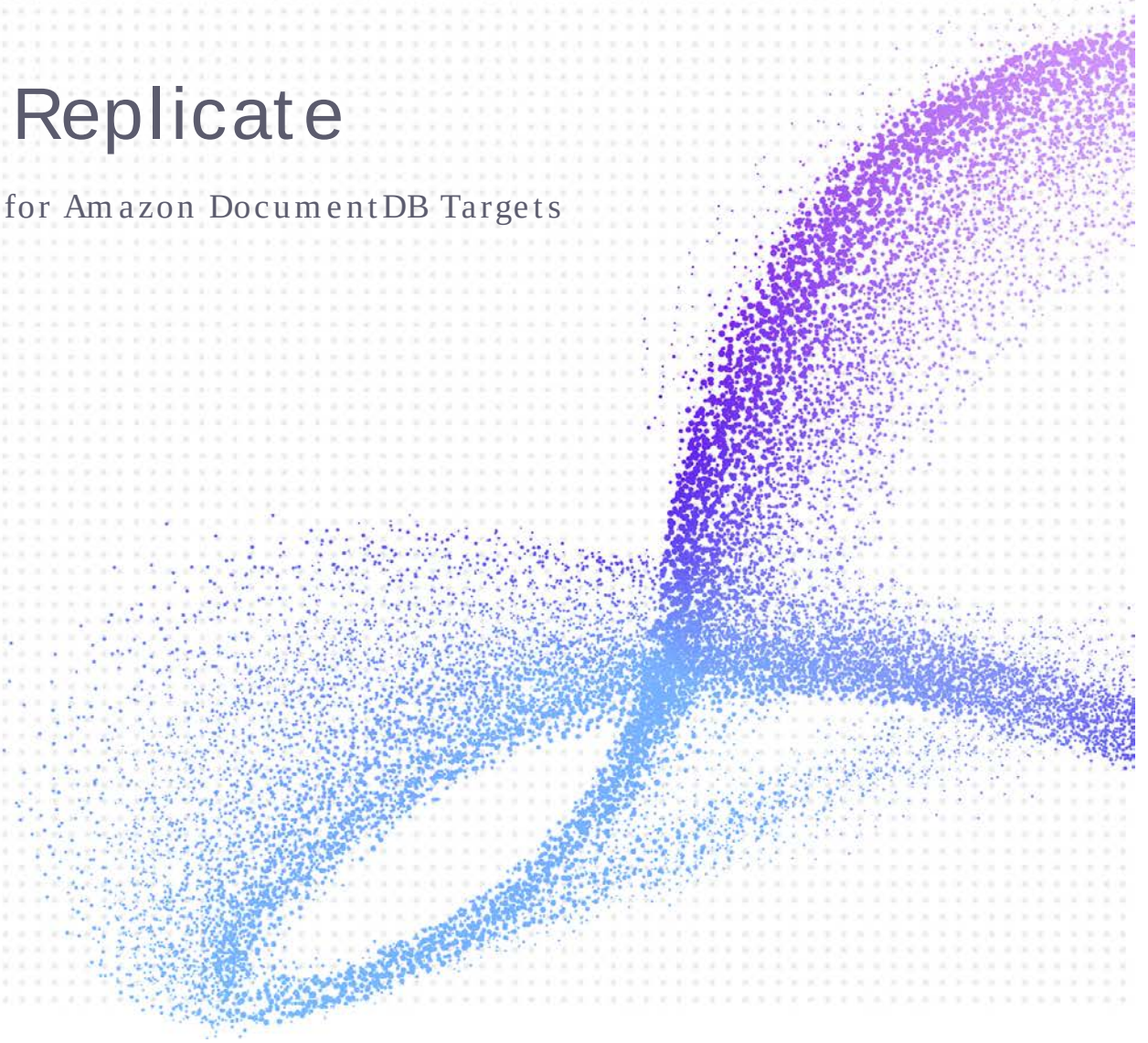
Syniti

# Syniti Replicate

## Setup Guide for Amazon DocumentDB Targets

Version 10.3



Syniti

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## Table of Contents

# Syniti Replicate

## Introduction

Syniti Replicate allows you to replicate data from relational database tables to Amazon DocumentDB, a cloud-based document database, using:

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

DocumentDB stores data in flexible, consistently formatted documents. All records in DocumentDB are associated with a specific *collection* inside a database. When replicating data using Syniti Replicate to DocumentDB, the DocumentDB file system is virtualized as relational tables (with columns and data types). You can create a target table and define a replication to a DocumentDB target, applying mappings and expression logic as you would normally do with relational database targets. The DocumentDB message is built internally using a JSON serialization of the entire record. Every replication must be associated with a DocumentDB collection, so that Syniti Replicate can determine where to publish the message.

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 AWS DocumentDB targets
- Map RDBMS sources to DocumentDB targets
- Enable replication

## Connection Type

For AWS DocumentDB, use .NET Driver MongoDB Driver Version 2.19.0. The latest stable version can be downloaded via:

https://www.nuget.org/packages/MongoDB.Driver/2.19.0

See **Download and Install .NET Provider** for more detail on installing the provider.

# Syniti Replicate

## 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.<br>• Syniti Knowledge Base<br>• Enter a generic support ticket |
| **Install. NET Provider for Source Database**<br>**(See Download and Install .NET Provider)** | 3. Go to https://www.nuget.org/packages/MongoDB.Driver/2.19.0<br>4. Run the nuget.exe command line tool.<br>5. Extract the correct version of the provider files. |
| **Syniti Replicate Setup** | In the Syniti Replicate Management Center:<br>1. In the Metadata Explorer, create a source connection to your RDBMS.<br>2. Create a target connection using the DocumentDB option in the **Database** field.<br>3. Create a replication. |
| **Start Replicating** | In the Syniti Replicate Service Monitor:<br>1. Start the Replication Agent. |

## Download and Install Syniti Replicate

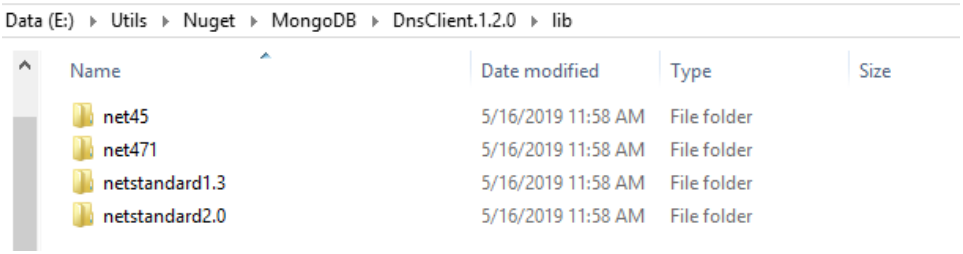
To download and/or register Syniti Replicate, log in to the support site, then click the relevant link in the Replicate section of the article.

## Download and Install .NET Provider

1. Install the .NET provider for DocumentDB. The link for the download is the following:
   https://www.nuget.org/packages/MongoDB.Driver/2.19.0
   This link includes all the assemblies needed to run the provider.
2. Run the nuget.exe command line tool (downloadable from www.nuget.org/downloads):
   `nuget install MongoDB.Driver -Version 2.19.0 -Framework net460 -OutputDirectory E:\Utils\Nuget\MongoDB`
   This command downloads all assemblies into the specified folder. However, there are separate folders for each of the assemblies.

3. Open each folder and extract the version of the .dll that is:
   - Valid for .NET framework 4.6 or earlier (**netxx**), if available OR
   - Use the latest .NET Standard framework (**netstandardxx**) version

   For instance, the DnsClient.1.2.0 contains the following subfolders:




   For .NET Framework 4.6 installations, you cannot use the net471 folder because it is higher than 4.6, but you can use net45. If that were not included, you would select netstandard2.0.

4. Copy the extracted assemblies to <SynitiDR-install-dir>/Plugins/MongoDB/:

- DnsClient.dll
- Microsoft.Bcl.AsyncInterfaces.dll
- Microsoft.Extensions.Logging.Abstractions.dll
- Microsoft.Win32.Registry.dll
- MongoDB.Bson.dll
- MongoDB.Driver.Core.dll
- MongoDB.Driver.dll
- MongoDB.Libmongocrypt.dll
- SharpCompress.dll
- Snappier.dll
- System.Buffers.dll
- System.Memory.dll
- System.Numerics.Vectors.dll
- System.Runtime.CompilerServices.Unsafe.dll
- System.Security.AccessControl.dll
- System.Security.Principal.Windows.dll
- System.Text.Encoding.CodePages.dll
- System.Threading.Tasks.Extensions.dll
- ZstdSharp.dll

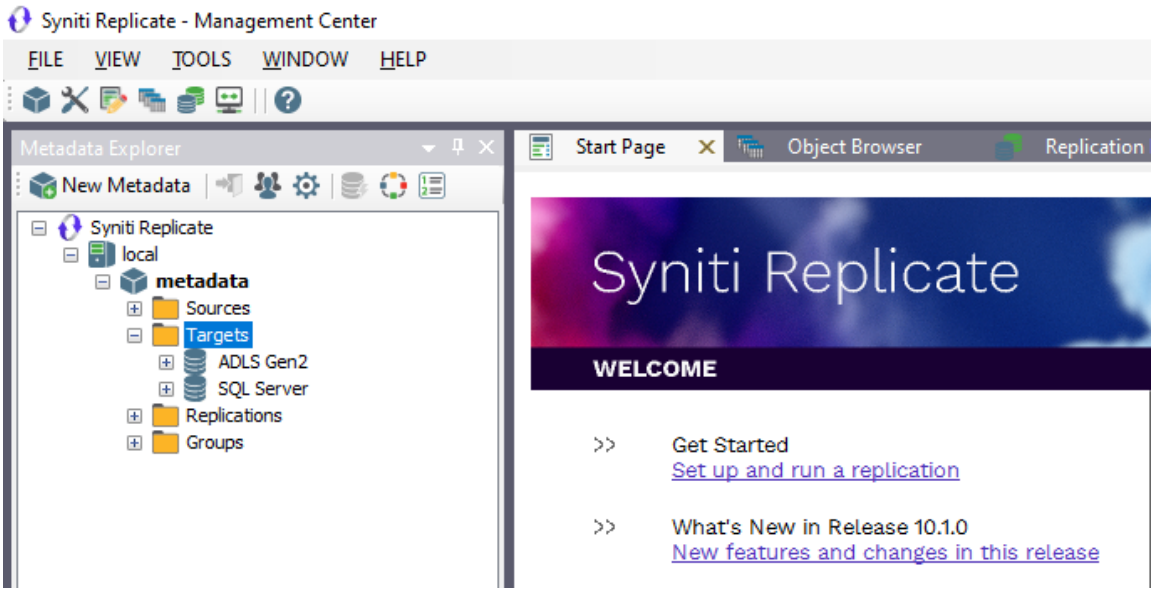
# Steps for Replicating Tables

Syniti Replicate support for replicating relational data to AWS DocumentDB 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 AWS DocumentDB. Check the Help Center for the latest list of supported databases.

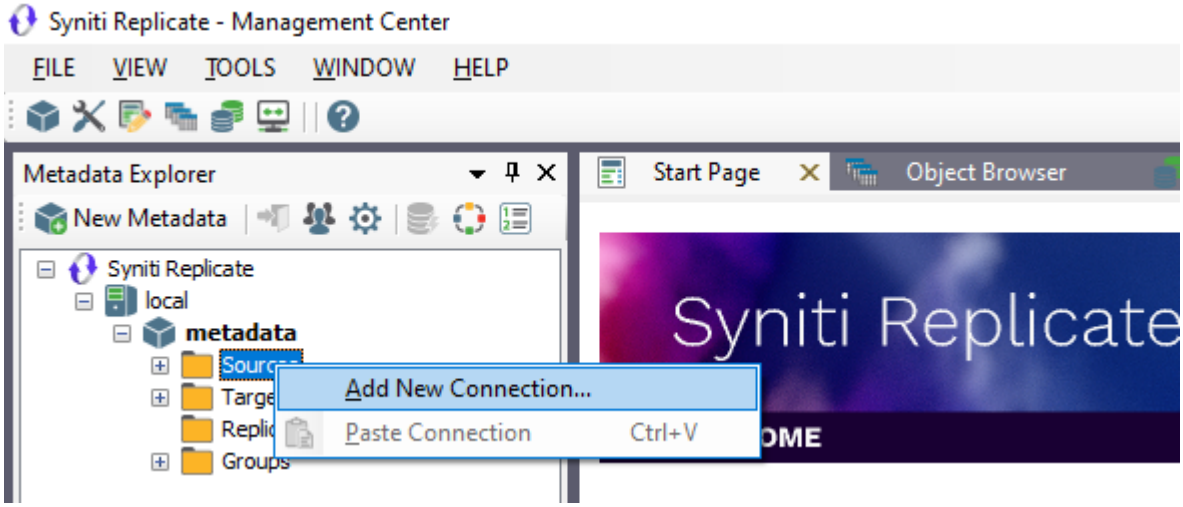
## 1. Set Up a Source Connection to a Relational Database

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. Use the Help Center to download a Setup Guide for your database for additional details.
2. Start Syniti Replicate Management Center.
   Syniti Replicate uses an internal metadata locally, all the information that Syniti Replicate needs to store about your replication setup. Set a proper database to store the Metadata, we recommend using MS SQL Server Express Edition.

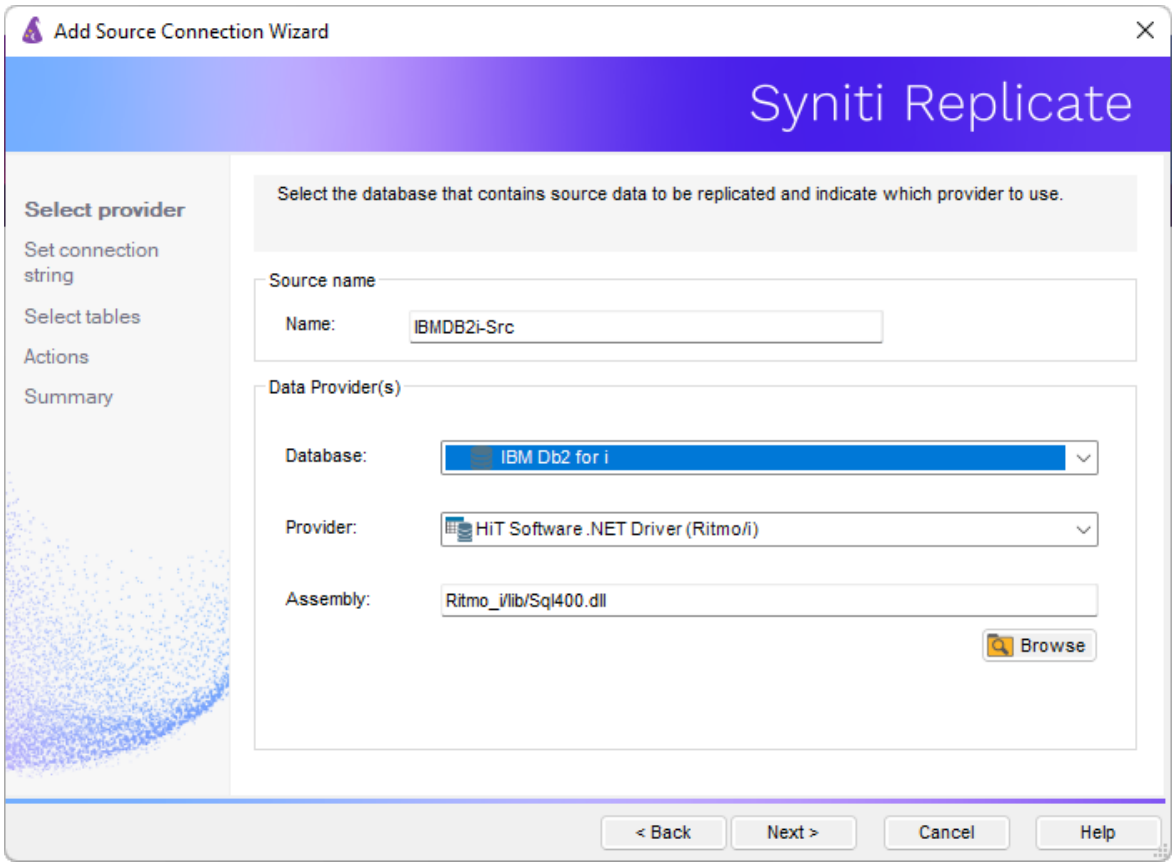



3. In the Metadata Explorer, expand the metadata node to view the **Sources** and **Targets** nodes.
4. Select the **Sources** node.

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 Syniti Replicate 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:

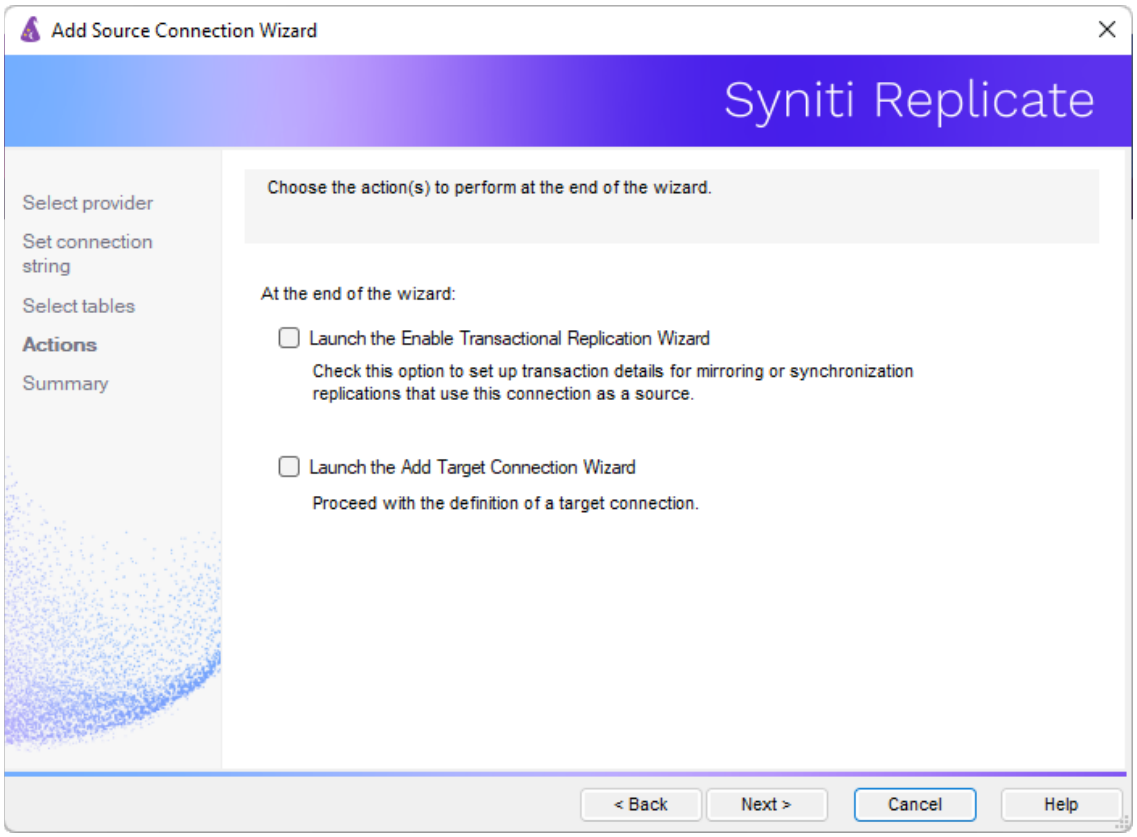
   **Connection Properties**
   Edit at least the **Required** connection properties by clicking in the property value field and typing a new value.

9. Click **Next** to choose the tables that you plan to replicate.

10. If using Refresh mode to replicate data to DocumentDB, in the **Actions** screen, check the option **Launch the Add Target Connection Wizard**.

-OR-

If using Mirroring mode to replicate data to DocumentDB, in the **Actions** screen, check the option **Launch the Enable Transactional Replication Wizard**.



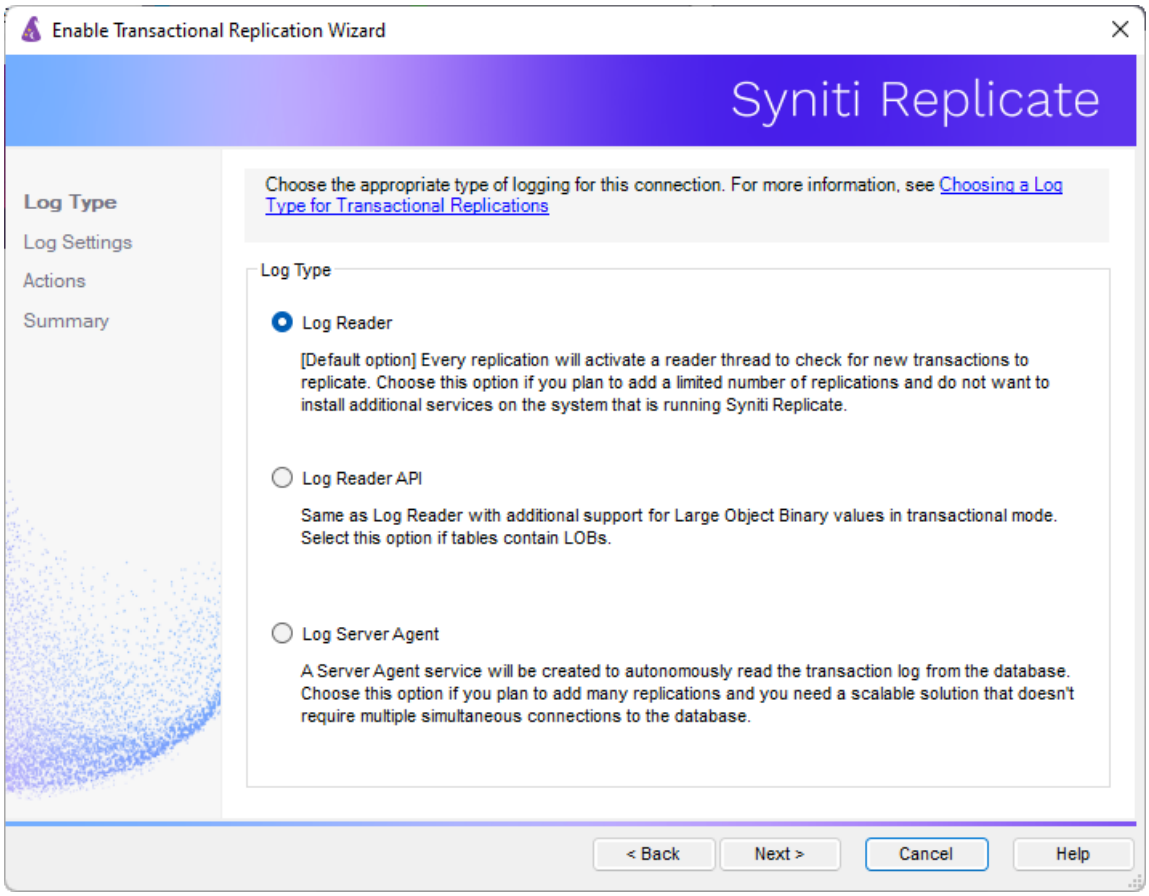

## 2. Configure the Enable Transactional Replication Wizard

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. Use the Help Center to download 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.

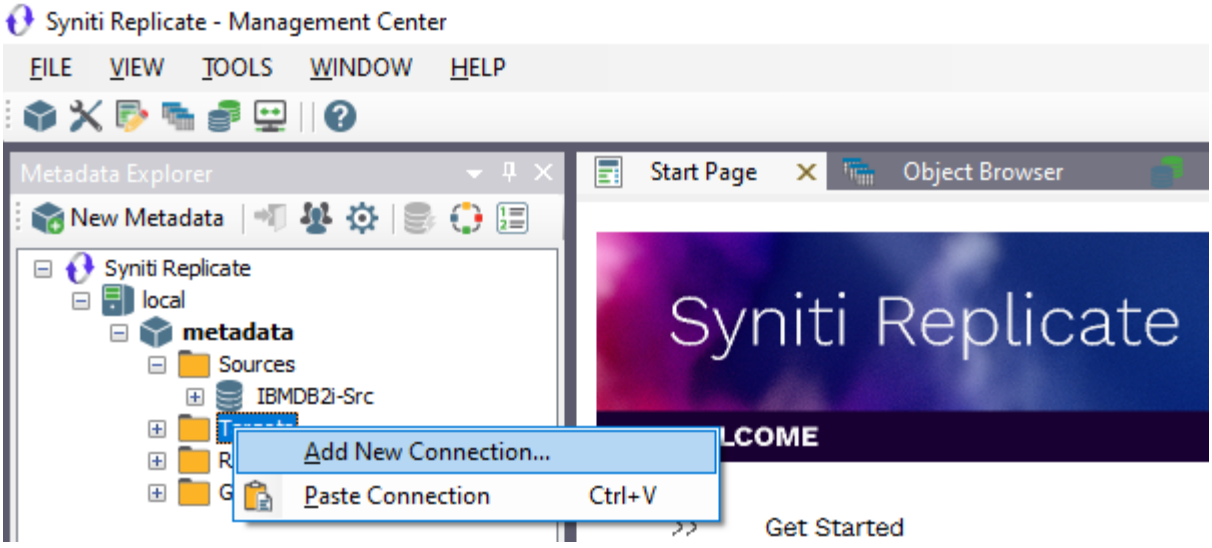
**Start service after completing the wizard:**
When checked, starts the service automatically after you click **Finish** to complete the wizard.

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 **Launch Add Target Connection Wizard**.
6. Click **Next** to review your changes.
7. Click **Finish** to complete the wizard.

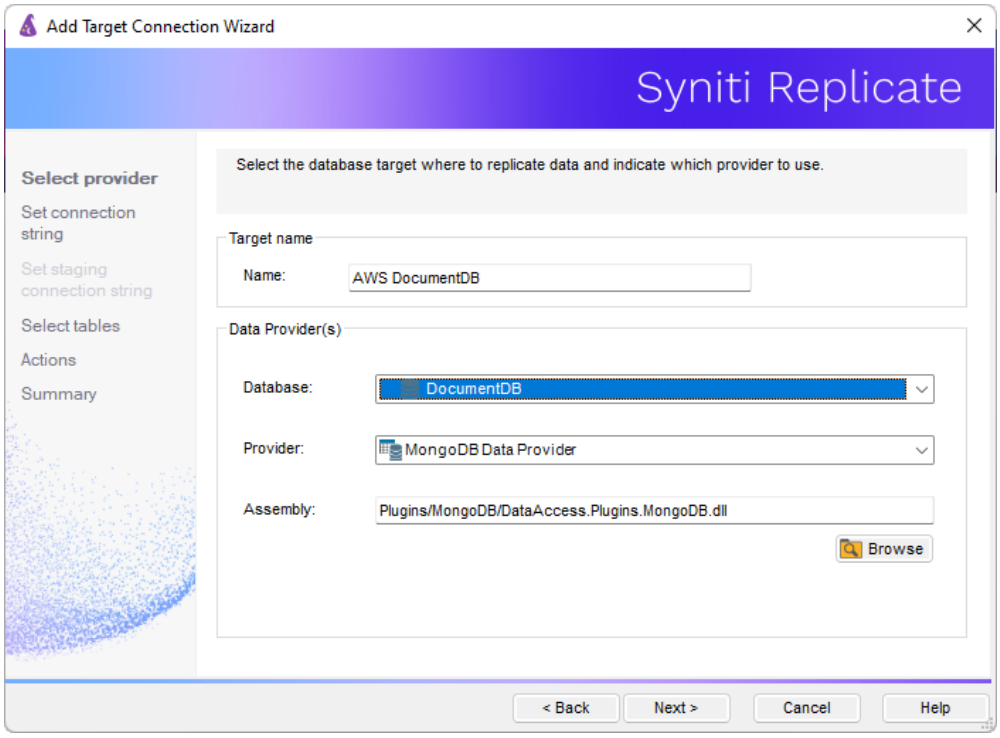
The source connection is now set up for transactional replications.

## 3. Set up a Target Connection to DocumentDB

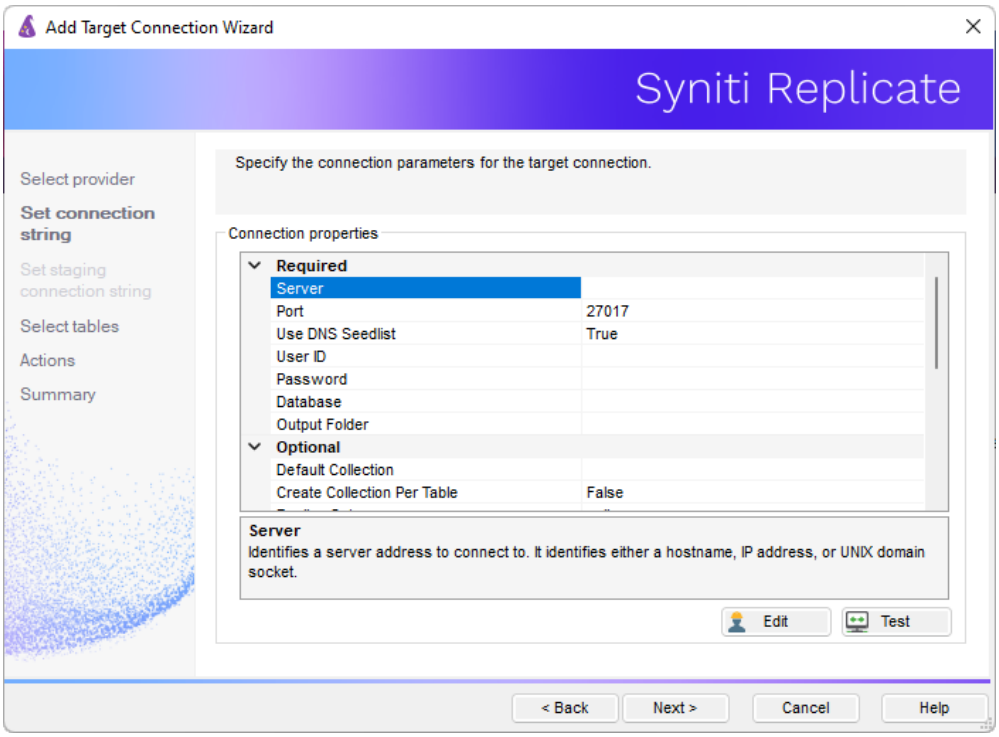
1. Select the **Targets** node.
2. From the right mouse button menu, choose **Add New Connection**.



3. In the Add Target Connection Wizard **Database** field, select the DocumentDB 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. The table displays only properties specific for use with Syniti Replicate. You can also set additional DocumentDB properties as needed.




## Connection Properties - Required Information

| | |
|---|---|
| **Server** | The server name or IP address of the DocumentDB instance. |
| **Port** | The port number of the server DocumentDB. |
| **Use DNS Seedlist** | If set to false, the standard connection format is used. If set to true, a DNS-constructed seed list is used. Using DNS to construct the available servers list allows more flexibility of deployment and the ability to change the servers in rotation without reconfiguring clients. |
| **User ID** | User name for DocumentDB |
| **Password** | Password for DocumentDB |
| **Database** | DocumentDB database name |
| **Output Folder** | The schema name and location to hold config files for the DocumentDB objects. |

### Connection Properties - Optional Information

| | |
|---|---|
| *Default Collection* | Default collection to use in replication. If a valid collection is set, all MongoDB documents will be added to this collection, otherwise a new collection will be created for each replicated table. |
| *Create Collection per Table* | If set to true, each replicated table will create a collection using the table name. In this case, the default collection property will be ignored. The collection can be changed using the Collection Name property of the table. |
| *Replica Set* | Specifies the name of the replica set, if the mongod is a member of a replica set. When connecting to a replica set it is important to give a seed list of at least two mongod instances. If you only provide the connection point of a single mongod instance, and omit the ReplicaSet, the client will create a standalone connection. |
| *Use SSL* | If set to true, the provider will initiate the connection with TLS / SSL. The default value is false. |
| *Connect Timeout* | The time in milliseconds to attempt a connection before timing out. The default (0) is never to timeout. |
| *Socket Timeout* | The time in milliseconds to attempt a send or receive on a socket before the attempt times out. The default (0) is never to timeout. |
| *Max Pool Size* | The maximum number of connections in the connection pool. The default value is 100. |
| *Min Pool Size* | The minimum number of connections in the connection pool. The default value is 0. |
| *Max Idle Time* | The maximum number of milliseconds that a connection can remain idle in the pool before being removed and closed. |
| *Read Concern Level* | The level of isolation. Can accept one of the following values:<br>**Local** - Default value. It read concern can read data which may be subsequently rolled back during replica set failovers<br>**Majority** - Enables multiple threads to perform reads and writes on a single document<br>**Linearizable** - It read concern can read data which may be subsequently rolled back during replica set failovers<br>**Available** - It read concern can read data which may be subsequently rolled back during replica set failovers |

| | |
|---|---|
| *Read Preferences* | Specifies the replica set read preference for this connection. The read preference values are the following:<br>- Primary<br>- PrimaryPreferred<br>- Secondary<br>- SecondaryPreferred<br>- Nearest.<br>The default value is Primary, which sends all read operations to the replica set. Multi-document transactions that contain read operations must use read preference primary. All operations in a given transaction must route to the same member. |
| Auth Source | Specify the database name associated with the user's credentials. AuthSource defaults to the database specified in the connection string. For authentication mechanism that delegate credential storage to other services, the authSource value should be $external as with the PLAIN(LDAP) and GSSAPI(Kerberos) authentication mechanism. MongoDB will ignore authSource values if the connection string specifies no username. |
| Auth Mechanism | Specify the authentication mechanism that MongoDB will use to authenticate the connection. Possible values: SCRAM - SHA-1; SCRAM - SHA-256 (Added in MongoDB 4.0); MONGODB-CR (removed in MongoDB 4.0); MONGDB X509; GSSAPI (Kerberos); PLAIN (LDAP SASL) |
| Retry Writes | Enable retryable writes. Possible values are true/false. The default value for 3.6 drivers is false |
| Use One Writer Per Group | Indicates if each replication group generates a common MongoDB writer or one writer for each replication in the group |
| Extended Properties | Additional properties not listed in the grid. Enter the properties as a list of "property=value" string separated by ";" |

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.

## 3. Add Table Information to the Target Connection

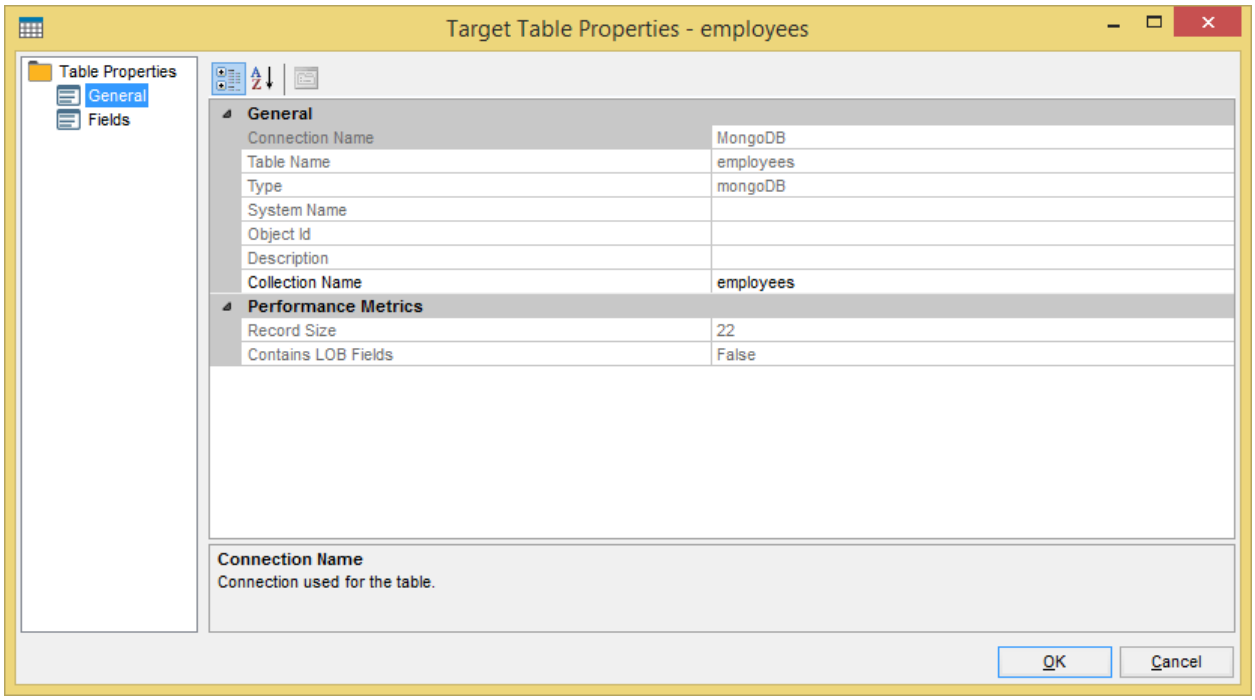
The target connection is displayed in the Metadata Explorer, but you still need to add the file representation for source table data so that when you create replications below, you can specify a source table and target "file."

1. In the Metadata Explorer, expand the source connection you created above.
2. Select and drag a source table to the target file connection.

   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.
3. In the **Source Connection** screen, you should see the source table you selected above.
4. Click **Next** to display the **Target Connection** screen.
5. Verify that the screen displays the correct target connection name, and table name.
6. 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.
7. 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.
8. Click **Next** to display the **Summary** screen.
9. Click **Finish** to create the table representation in the Metadata Explorer.
10. Click **Yes** to add the table name to the target connection entry in the Metadata Explorer
11. 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.

If you select the table and edit the Properties, there is a new property called **Collection Name**:

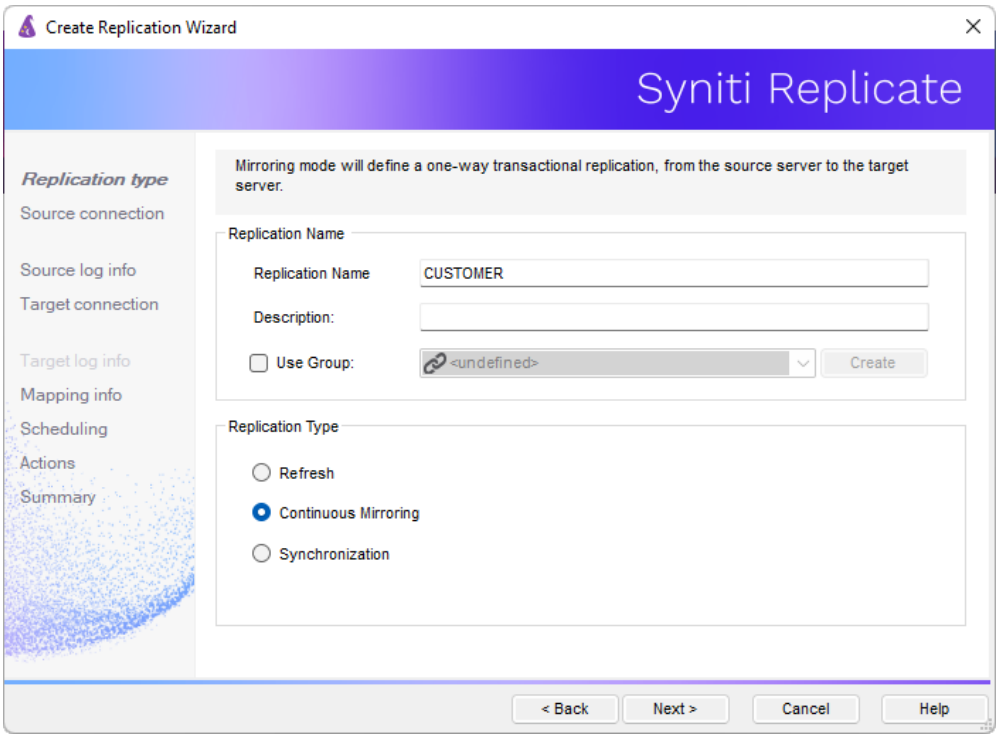



**Collection Name** can be edited. If blank, Syniti Replicate uses the **Default Collection** property of the connection to determine to which collection to deliver the records. Otherwise, it uses the collection indicated in this field.

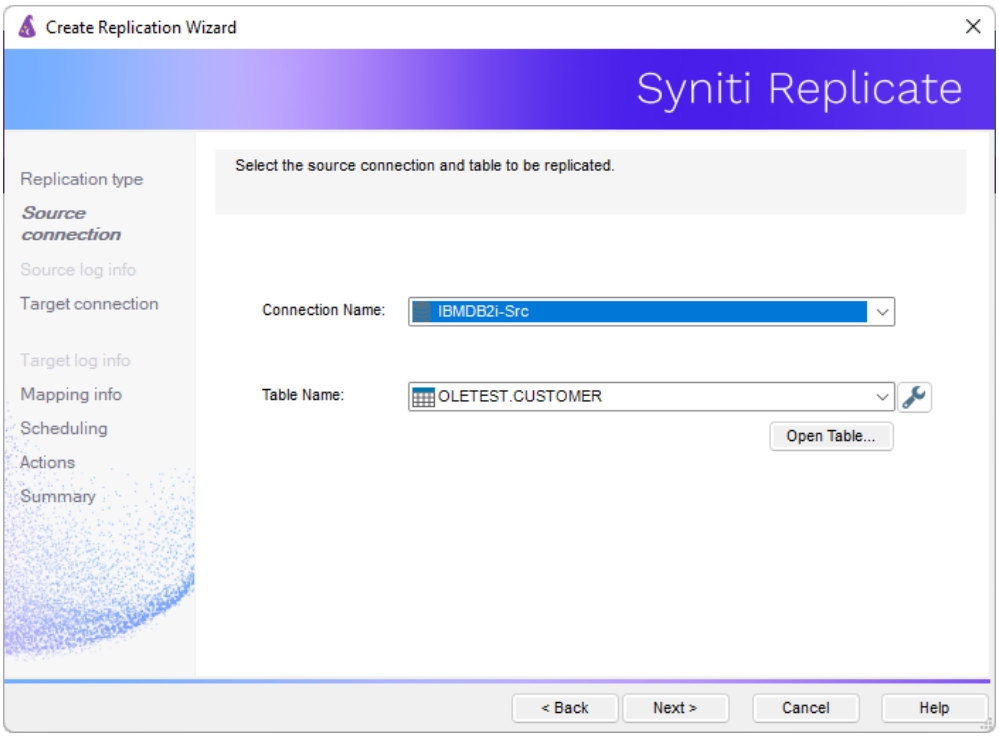
Note that if you replicate a table that has a blank collection value both here and, in the connection, the Replication Agent generates an error and disables the replication, unless you set the **Create Collection Per Table** property to True, in which case a collection will be created automatically.

## 4. Define Replications

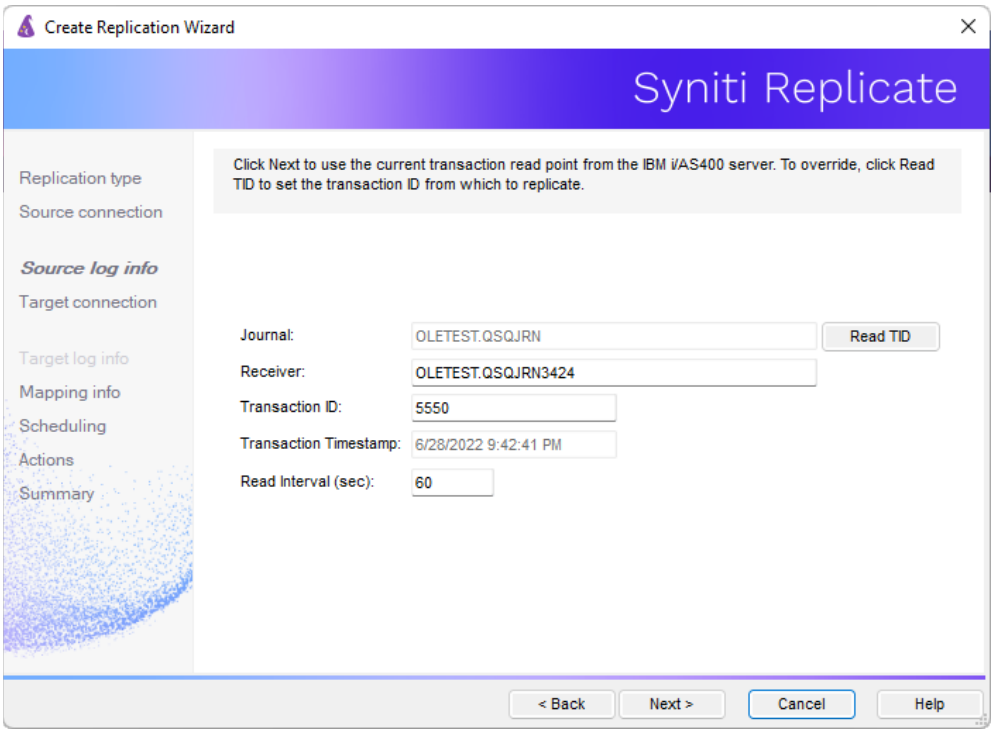
1. Expand the Metadata Explorer tree to display the table that contains the data you want to replicate.
2. Select the table.
3. From the right mouse button menu, choose **Replication** then **Create New Replication**....
4. In the Define Replication Type screen, type a name to identify the replication.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



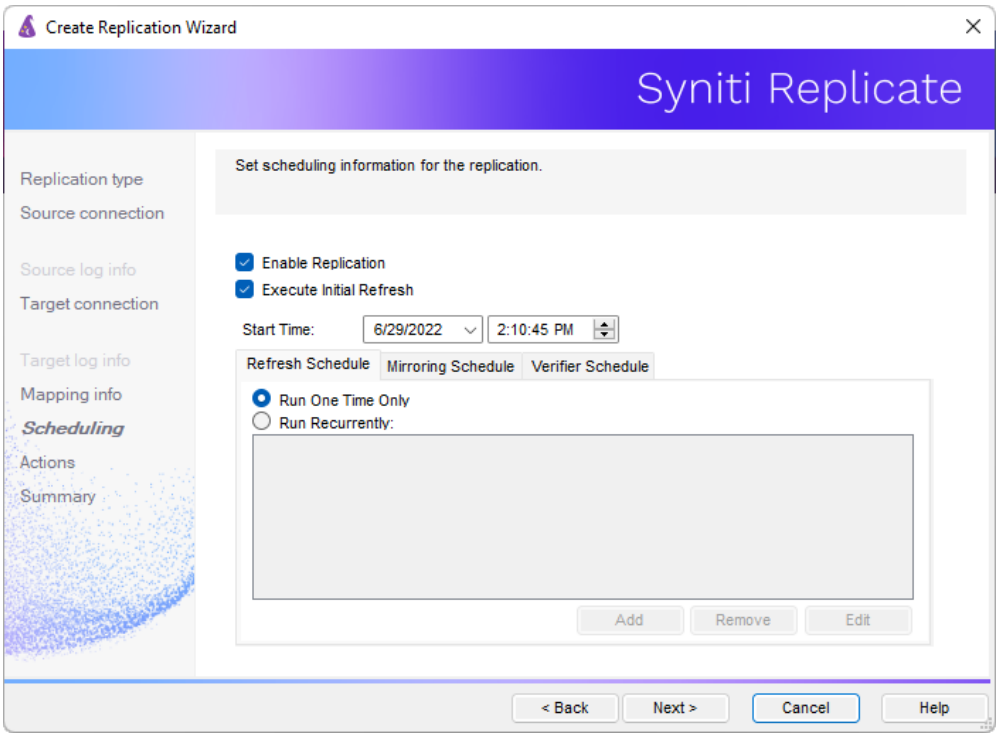

7. Click **Next** to go to the **Select Source Connection** screen.




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 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 Replication Agent 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 Service Monitor 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.

## Replication Results

Because DocumentDB is not a standard relational database and only handles messages, it is not possible to open the content of a target table in the Management Center to verify if the replication has been successful. To do that, use another application that is able to act as a consumer to receive the messages sent to DocumentDB.