# Syniti

# Syniti Replicate

Setup Guide for MongoDB Atlas Targets Version 10.2



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### Introduction

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

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

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

### **Connection Type**

For MongoDB 4.0, use .NET Driver Version 2.8.0. The latest stable version can be downloaded via: <u>https://www.nuget.org/packages/MongoDB.Driver/2.8.0</u>

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

### 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 articleacts as a hub to point to variousresources. 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	3. Go to <u>https://www.nuget.org/packages/MongoDB.Driver/2.8.0</u>		
for Source Database	4. Run the nuget.exe command line tool.		
(See <u>Download and</u> Install .NET Provider)	5. Extract the correct version of the provider files.		
Syniti Replicate	In the Syniti Replicate Management Center:		
Setup	1. In the Metadata Explorer, create a source connection to your RDBMS.		
Setup	<ol> <li>In the Metadata Explorer, create a source connection to your RDBMS.</li> <li>Create a target connection using the MongoDB Atlas option in the Database field.</li> </ol>		
Setup	<ol> <li>In the Metadata Explorer, create a source connection to your RDBMS.</li> <li>Create a target connection using the MongoDB Atlas option in the Database field.</li> <li>Create a replication.</li> </ol>		
Setup Start Replicating	<ol> <li>In the Metadata Explorer, create a source connection to your RDBMS.</li> <li>Create a target connection using the MongoDB Atlas option in the Database field.</li> <li>Create a replication.</li> <li>In the Syniti Replicate Service Monitor:</li> </ol>		
Setup Start Replicating	<ol> <li>In the Metadata Explorer, create a source connection to your RDBMS.</li> <li>Create a target connection using the MongoDB Atlas option in the Database field.</li> <li>Create a replication.</li> <li>In the Syniti Replicate Service Monitor:</li> <li>Start the Replication Agent.</li> </ol>		

### Download and Install Syniti Replicate

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

### Download and Install .NET Provider

On the system where you plan to install Syniti Data Replication, make sure that you are running Microsoft .NET Framework 4.8 or above.

- Install the .NET provider for MongoDB. The link for the download is the following: <u>https://www.nuget.org/packages/MongoDB.Driver/2.8.0</u> This link includes all the assemblies needed to run the provider.
- 2. Run the nuget.exe command line tool (downloadable from <u>www.nuget.org/downloads</u>): nuget install MongoDB.Driver -Version 2.8.0 -Framework net480 -OutputDirectory E:\Utils\Nuget\MongoDB

This command downloads all assemblies into the specified folder. However, there are separate folders for each of the assemblies:

Data	(E:) → Utils → Nuget → MongoDB			
^	Name	Date modified	Туре	Size
	퉬 DnsClient.1.2.0	5/16/2019 11:58 AM	File folder	
	🌗 MongoDB.Bson.2.8.0	5/16/2019 11:58 AM	File folder	
	MongoDB.Driver.2.8.0	5/16/2019 11:58 AM	File folder	
	MongoDB.Driver.Core.2.8.0	5/16/2019 11:58 AM	File folder	
	퉬 System.Buffers.4.4.0	5/16/2019 11:58 AM	File folder	
	🍌 System.Runtime.InteropServices.Runtime	5/16/2019 11:58 AM	File folder	

- 3. Open each folder and extract the version of the .dll that is:
  - Valid for .NET framework 4.8 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 4.8 installations, you can use the net471 folder.

- 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
  - mongocrypt.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 MongoDB Atlas 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 MongoDB. Check <u>the Help Center</u> 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 <u>Help Center</u> to <u>download a Setup Guide</u> for your database for additional details.
  - 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.

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😯 Syniti Replicate - Management Center	
<u>FILE VIEW TOOLS WINDOW H</u> ELP	
🏟 🗙 🖻 🐂 🧬 🖳 🛛 🚱	
Metadata Explorer 🛛 👻 👎 🗙	📰 Start Page 🗙 🏣 Object Browser 📄 Replication
🗄 🍘 New Metadata   📲 🏰 🎲   🌅 🛟 🚍	
<ul> <li>Syniti Replicate</li> <li>■ local</li> <li>■ ■ metadata</li> <li>■ ■ Sources</li> <li>■ ■ Targets</li> </ul>	Syniti Replicate
ADLS Gen2     SOL Server	WELCOME
	<ul> <li>&gt;&gt; Get Started Set up and run a replication</li> <li>&gt;&gt; What's New in Release 10.1.0 New features and changes in this release</li> </ul>
Groups     Groups	<ul> <li>Set Started Set up and run a replication</li> <li>What's New in Release 10.1.0 New features and changes in this release</li> </ul>

- 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.

🚯 Syniti Replicate - Management Center	
<u>FILE VIEW TOOLS WINDOW H</u> ELP	
🏟 🗙 🖻 🐂 💣 🖳    😧	
Metadata Explorer 🔹 🖣 🗙	📰 Start Page 🗙 🐃 Object Browser 👘
🗄 🎲 New Metadata   📲 🧏 🏟   🅃 🛟 🔚	
Syniti Replicate	
e 😭 metadata	Syniti Replicate
Source     Add New Connection	
Replic Paste Connection	Ctrl+V DME
⊕ Groups	

- 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.

💧 Add Source Connectio	on Wizard	X
		Syniti Replicate
Select provider	Select the datab	pase that contains source data to be replicated and indicate which provider to use.
Set connection string	Source name	
Actions	Name:	IBMDB2i-Src
Summary	Database:	IBM Db2 for i
	Provider:	HiT Software .NET Driver (Ritmo/i)
	Assembly:	Ritmo_i/lib/Sql400.dll
100 L		<b>Q</b> Browse
		< Back Next > Cancel Help

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 MongoDB, in the Actions screen, check the option Launch the Add Target Connection Wizard.

- OR-

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

💰 Add Source Connect	tion Wizard X
	Syniti Replicate
Select provider	Choose the action(s) to perform at the end of the wizard.
Set connection string	
Select tables	At the end of the wilzard:
Actions	Launch the Enable Transactional Replication Wizard
Summary	Check this option to set up transaction details for mirroring or synchronization replications that use this connection as a source.
5	Launch the Add Target Connection Wizard
	Proceed with the definition of a target connection.
	< Back Next > Cancel Help

### 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:

 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.)

💧 Enable Transactional	Replication Wizard X
	Syniti Replicate
Log Type Log Settings	Choose the appropriate type of logging for this connection. For more information, see <u>Choosing a Log</u> Type for Transactional Replications
Actions	Log Type
Summary	O Log Reader
	<ul> <li>[Default option] Every replication will activate a reader thread to check for new transactions to replicate. Choose this option if you plan to add a limited number of replications and do not want to install additional services on the system that is running Syniti Replicate.</li> <li>Log Reader API</li> </ul>
	Same as Log Reader with additional support for Large Object binary values in transactional mode. Select this option if tables contain LOBs.
	O Log Server Agent
Contraction of the second	A Server Agent service will be created to autonomously read the transaction log from the database. Choose this option if you plan to add many replications and you need a scalable solution that doesn't require multiple simultaneous connections to the database.
	< Back Next > Cancel Help

- 2. Click **Next** to enter the log settings. The fields and appropriate values depend on the database and log type. Use the <u>Help Center</u> to <u>download a Setup Guide</u> 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 MongoDB

- 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 MongoDB Atlas option. The **Provider** and **Assembly** fields are automatically filled out for you.

💰 Add Target Connection	n Wizard	×
		Syniti Replicate
Select provider	Select the data	base target where to replicate data and indicate which provider to use.
Set connection string	Target name	
Set staging connection string	Name:	MongoDB
Select tables	Data Provider(s)	
Actions		
Summary	Database:	MongoDB Atlas 🗸 🗸
	Provider:	MongoDB Data Provider 🗸 🗸
	Assembly:	Plugins/MongoDB/DataAccess.Plugins.MongoDB.dll
Constant of the second		C Browse
		< Back Next > Cancel Help

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 MongoDB properties as needed.

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💰 Add Target Connectio	n Wizard		×
			Syniti Replicate
Select provider	Specif	y the connection parameters for the	target connection.
Set connection string	Connec	tion properties	
Set staging	$\sim$	Required	
connection string		Server	
	1	Port	27017
Select tables	1	Use DNS Seedlist	True
Actions	1	User ID	
0	1	Password	
Summary	1	Database	
	(	Output Folder	
	$\sim$ (	Optional	
	1	Default Collection	
	(	Create Collection Per Table	False
Contraction of the second	Serv Ident sock	ver iffies a server address to connect to et.	<ul> <li>It identifies either a hostname, IP address, or UNIX domain</li> <li>Edit</li> </ul>
			< Back Next > Cancel Help

Server	Theserver nameor IP address of the MongoDB instance.
Port	Theport number of theserver MongoDB.
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 MongoDB Atlas
Password	Password for MongoDB Atlas
Database	MongoDB database name
Output Folder	The schema name and location to hold config files for the MongoDB objects.
Default Collection	All MongoDB replications need to be targeted to a specific collection. Use this field to indicate a default collection for all replications in that connection. Alternatively, if the Default Collection is left blank, every replication will need a collection name.
Create Collection Per Table	If set to true, every new replication will attempt to use the collection named as the target table. If the collection does not exist, it will be created using the Syniti Replicate table name.

Use One Writer Per	Default is True. When True, Syniti Replicate uses a single writer object common to all replications
Group	in agroup (if groupsare used). When False, a new object is created for each replication.

- 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.
- 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.
- 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**:

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	Target Table Pr	operties - employees	- 🗆 ×
Table Properties			
Fields	⊿ General		
	Connection Name	MongoDB	
	Table Name	employees	
	Туре	mongoDB	
	System Name		
	Object ld		
	Description		
	Collection Name	employees	
	Performance Metrics		
	Record Size	22	
	Contains LOB Fields	False	
	Connection Name		
	Connection used for the table.		
			OK Cancel

**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.

💰 Create Replication Wiz	zard	×
		Syniti Replicate
<i>Replication type</i> Source connection	Mirroring mode will defin server.	e a one-way transactional replication, from the source server to the target
Source log info Target connection Target log info Mapping info Scheduling Actions Summary	Replication Name Replication Name Description:	CUSTOMER
	Replication Type Refresh Continuous Mirror Synchronization	ing
		< Back Next > Cancel Help

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

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💰 Create Replication Wiz	ard				×
			Syniti	Replica	ate
Replication type Source	Select the source conne	ection and table to be replicated.			
connection					
Target connection	Connection Name:	IBMDB2i-Src		~	
Target log info Mapping info Scheduling Actions Summary	Table Name:	OLETEST.CUSTOMER		V J	۶
		< Back	Next >	Cancel	Help

- 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.

💰 Create Replication Wizard X				
			Syniti Re	plicate
Replication type Source connection <i>Source log info</i> Target connection	Click Next to use the curre TID to set the transaction	ent transaction read point from ID from which to replicate.	the IBM i/AS400 server. To ove	erride, click Read
Target log info Mapping info Scheduling Actions Summary	Journal: Receiver: Transaction ID: Transaction Timestamp: Read Interval (sec):	OLETEST.QSQJRN OLETEST.QSQJRN3424 5550 6/28/2022 9:42:41 PM 60		Read TID
		< Back	Next > Cance	el Help

- 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.
- 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.

💰 Create Replication Wiz	ard X
	Syniti Replicate
Replication type Source connection Source log info	Set scheduling information for the replication.
Target connection	Execute Initial Refresh Start Time: 6/29/2022  2:10:45 PM
Actions Summary	Refresh Schedule       Mirroring Schedule       Verifier Schedule         Run One Time Only       Run Recurrently:
	Add Remove Edit

- 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.
- 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 sin 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 S
- 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 MongoDB 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 MongoDB.