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Document History

Version	Author	Date	Reviewer	Date	Comments
1	JHLorenzin	2/5/15	GBiccari	2/5/15	
2	JHLorenzin	5/24/18	ALaspertini		File target only
3	JHLorenzin	9/27/19	ALaspertini		File target only
4	JHLorenzin	7/20/21	ALaspertini	7/20/21	Added File source
5	JHLorenzin	11/30/21	AMillalen		

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

• Refresh

A one-time complete replication from source table to flat 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 flat 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.

When replicating from a flat file, Syniti DR allows you to replicate data using:

• Refresh

Refresh (Snapshot replication)

A one-time complete replication from a flat file source to any supported target, according to replication settings and scripts. You can control the timing of the replication, identify the data to be replicated and add scripts to transform data during replication.

For complete details on the setup process, check the *Syniti Data Replication User Guide* available from the Management Center **Help** menu or the *Syniti Data Replication Setup Guide*, available for download in the <u>Help</u> <u>Center</u>.

Connection Type

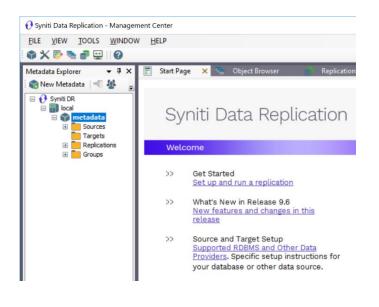
When replicating to a file target, no specific connector needs to be installed.

When replicating from a file as a source, use the Microsoft Text ODBC Driver. This driver is typically available with Microsoft Office packages containing Access, or by installing the <u>Microsoft Access Database Engine 2010</u> <u>Redistributable</u>.

Replicating Data from a Relational Database to a File

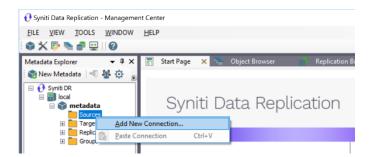
- Make sure you have <u>database connections via a .NET data provider</u> to the supported databases for source database tables.
- Start Syniti DR Management Center.

Syniti DR provides a default database (Microsoft SQL Server CE) for your metadata, all the information that Syniti DR 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 <u>Add Source Connection Wizard</u>, follow steps to add a connection string and test the connection to the database.

Check the Supported Provider List in the <u>Help Center</u> before entering a value in the Assembly field.

💰 Add Source Connectio	n Wizard		×
		Syniti Data Replication	
Select provider	Select the data	base that contains source data to be replicated and indicate which provider to use.	
string	Source name		
Select tables	Name:	IBMDB2i-Src	
Actions Summary	Data Provider(s)		
-	Database:	IBM Db2 for i	
	Provider:	HIT Software .NET Driver (Ritmo/i)	
1. A.	Assembly:	Ritmo_i/lib/Sql400.dll	
Same		Browse	
		< Back Next > Cancel Help	

- 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.

💰 Add Source Connectio	n Wizard	×
	Syniti Data Replication	
Select provider	Choose the action(s) to perform at the end of the wizard.	
Set connection string Select tables Actions Summary	At the end of the wizard: Launch the Enable Transactional Replication Wizard Check this option to set up transaction details for mirroring or synchronization replications that use this connection as a source.	
-	Launch the Add Target Connection Wizard Proceed with the definition of a target connection.	
	< Back Next > Cancel Help	2

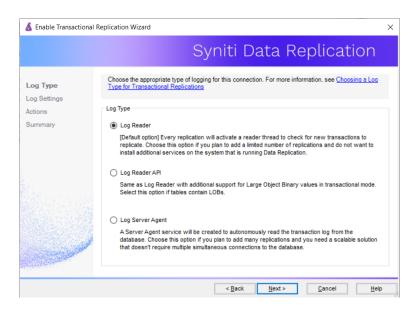
7. Complete the wizard.

Enable Transactional Replication

This section assumes you are planning to replicate data to a flat 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:

8. 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.

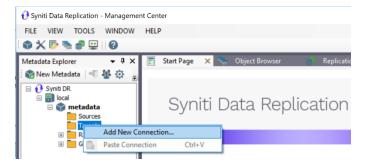


- 9. Click **Next** to enter the log settings. The fields and appropriate values depend on the database and log type. You can obtain a setup guide for a specific relational database by making a request in the <u>Help Center</u>.
- 10. Click **Next** to verify your settings against the source connection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

The source connection is now set up for transactional replications.

Set Up Target Connection to a Flat 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...**



14. In the Target Connection Wizard Provider field, select the Files option.

💰 Add Target Connectior	n Wizard		×
		Syniti Data Replication	
Select provider	Select the datab	ase target where to replicate data and indicate which provider to use.	
Set connection string Select tables	Target name Name:	FieTgt	
Actions Summary	Data Provider(s)		
	Database: Provider:	Files - CSV	
	Assembly:		
Second and			
		< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel <u>H</u> elp	,

15. Click Next to display the Set connection string screen.

💰 Add Target Connection	Wizard	>
	Sy	niti Data Replication
Select provider	Specify the connection parameters for	the target connection.
Set connection string	Connection properties	
Select tables	✓ Required	
Actions	Output Folder	
	Use Column Names	True
Summary	Add Transactional Info	Yes, first column
	Column Separator	2
	Column Escape	1
	String Separator	
	String Escape	1
	Use One File Per Group	False
	ExtendedProperties	T also
	Output Folder Path for the schema and output files.	👱 Edit 🛄 Iest
		< <u>B</u> ack Next > Cancel Help

16. Set the Use Column Names field to False.

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17. Make sure that the Add Transactional Info field is set to Yes, first column.

At this point, there is no text output structure available to display. You can add the information after completing the Target Connection wizard.

- 18. Click Next to display the Summary page.
- 19. Click **Finish** to complete the wizard.

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."

- 20. In the Metadata Explorer, expand the source connection you created above.
- 21. Select and drag a source table to the target file connection.
- 22. 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.

- 23. In the **Source Connection** screen, you should see the source table you selected above.
- 24. Click Next to display the Target Connection screen.
- 25. Verify that the screen displays the correct target connection name, and table name.
- 26.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.

27. 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 DR outputs the table information to a file.

- 28.Click Next to display the Summary screen.
- 29.Click Finish to create the table representation in the Metadata Explorer.
- 30.Click Yes to add the table name to the target connection entry in the Metadata Explorer
- 31. 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 Files 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...**

32.In the **Define Replication Type** screen, type a name to identify the replication.

33.Optionally provide a description of the replication.

34. In the Replication Mode area, choose Continuous Mirroring.

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Replication type Mirroring mode will define a one-way transactional replication, from the source server to the target server. Source connection Replication Name Source log info Replication Name Target connection Description: Target log info Use Group: Additions Create Replication Type Actions Refresh Summary Source continuous Mirroring Synchronization Synchronization			Syniti Data Replication
Source log info Replication Name Customer Target connection Description:		server.	ne a one-way transactional replication, from the source server to the target
Scheduling Replication Type Actions O Refresh Summary © Continuous Mirroring	Target connection	Replication Name Description:	
and the second se	Scheduling Actions Summary	Refresh Ocontinuous Mirro	ring

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

💰 Create Replication Wiz	ard	
		Syniti Data Replication
Replication type Source	Select the source conn	ection and table to be replicated.
connection		
Source log info Target connection		
l arget connection	Connection Name:	DB2iPubs V
Mapping info	Table Name:	TRAINING.CUSTOMERS
Scheduling		Open Table
Actions Summary		
		< Back Next > Cancel Help

36. Choose the source name from the drop-down list that includes all the source connections you have created.

37. Choose the table that you want to replicate from the drop-down list.

38. If you want more information about the table before proceeding, click Open Table....

39.Click Next to go to the Source Log Info screen.

💰 Create Replication Wiz	ard		×
		Syniti Data Replication	
Replication type Source connection		ent transaction read point from the IBM VAS400 server. To override, click Read ID from which to replicate.	
Source log info			
Target log info Mapping info Scheduling Actions Summary	Journal: Receiver: Transaction ID: Transaction Timestamp: Read Interval (sec):	TRAINING.QSQJRN Beed TD TRAINING.QSQJRN0001 23 7/15/2019 8:08:20 PM 60	
		< Back Next > Cancel Help	

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 <u>Replication Wizard</u> 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.

- 40.In the Transaction ID field, click Read to open the Read Point dialog.
- 41. Choose either the current transaction or a transaction ID based on a time and date.
- 42. Click OK to add the value to the Source Log Info screen.
- 43.Set the value of the **Read Interval** field to the frequency with which you want Syniti DR to check the transaction log for new events to mirror.
- 44.Click Next to go to the Select Target Connection screen.
- 45. Choose the target connection for text output from the drop-down list that includes all the target connections you have created.
- 46.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.
- 47.Click **Next** to go to the **Set Mapping Info** screen. Source columns and target data with the same name are automatically mapped.
- 48.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.
- 49. 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.

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50.Go to the Mirroring Schedule tab.

51. 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.

52. Make sure the **Enable Replication** option is checked. This is required for the replication to run.

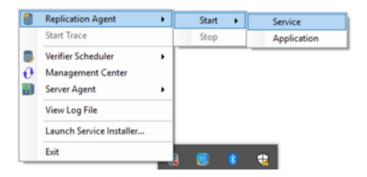
53. Click Next to go to the Summary screen.

54.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 꽥 in the Windows Notification Area.



The replication that you have scheduled should start at the specified time. Use the <u>Replication Monitor</u> 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 Data Replication, then Service Installer.
- Manage the service from Service Monitor program (located in the 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.

Flat File Structure

Files used as a replication target have the following structure. The file has a .mir extension when used for mirroring and a .ref extension when used for snapshot, or refresh replications.

Column	Value
1	Sequence number
2	Timestamp of transaction
3	User, if provided by the database
4	Table name
5	Operation code – one of I (Insert), U (Update) or D (Delete)
6	Previous primary key value for the database column. This is used for update operations to identify the correct record
7	Next primary key value. This is used for update operations to identify the correct record in cases where the primary key is changed during the update operation
8	Database column value

Example File

Example filename: corp_20150115T161123155064_1.mir

```
10,2015-01-22 15:32:39.000000,,"glb","I",,2,"test insert"
11,2015-01-22 15:32:40.000000,," glb ","D",10,,
12,2015-01-22 15:32:42.000000,," glb ","U",104,104,"my updated"
13,2015-01-22 15:32:44.000000,," glb ","U",1,12,"sd"
```

Replicating Data from a CSV File

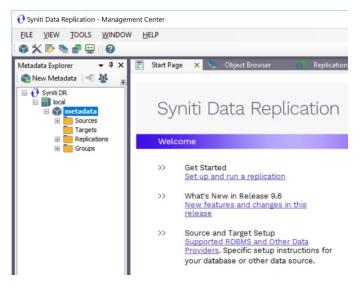
Source data files should contain comma-separated column names as the first row, followed by one row of data per record as a list of comma-separated column values.

ID,NAME

1,"aaa"

2,"bbb"

- Make sure you have <u>database connections via a .NET data provider</u> to the supported databases for source database tables.
- Start Syniti DR Management Center. Syniti DR provides a default database (Microsoft SQL Server CE) for your metadata, all the information that Syniti DR 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.

🚯 Syniti Data Replication - Manageme	nt Center
EILE VIEW TOOLS WINDOW	Herb
Metadata Explorer 👻 🖡 🗙	🔄 Start Page 🗙 🔚 Object Browser 👘 Replication B
Syniti DR Syniti DR Sources Sources	Syniti Data Replication
	w Connection
	onnection Ctrl+V

4. In the Select Provider screen, enter a name for the source and, in the Database field, choose Files - CSV.

💰 Add Source Connection Wizard			×
		Syniti Data Replication	
Select provider	Select the datat	ase that contains source data to be replicated and indicate which provider to use.	
Set connection string	Source name		
Select tables	Name:	TxtSrc	
Actions Summary	Data Provider(s)		
	Database:	Files - CSV V	
	Provider:	Microsoft Text Driver 🗸	
Sand Barris			
Sector Connector			_
		< Back Next > Cancel Help	

5. Click **Next** to display the Set Connection String screen.

💰 Add Source Connection Wizard		×
	S	Syniti Data Replication
Select provider	Specify the connection parameters	for the source connection.
Set connection string	Connection properties	
Select tables	Required Driver	Microsoft Access Text Driver (*.txt, *.csv)
Actions Summary	Connection String	Driver={Microsoft Access Text Driver (*.txt, *.csv)}
	Driver ODBC driver name.	Edt Iest
		< Back Next > Cancel Help

- 6. Click the **Connection String** value to display the Ellipsis button
- 7. Click 🔤 to display the ODBC Text Setup dialog. Use this dialog to set the folder containing text files to replicate.

ODBC Text Setup	? ×
Data Source <u>N</u> ame:	ОК
Description:	Cancel
Database	Help
Directory:	
Select Directory	
Use Current Directory	<u>O</u> ptions>>

- 8. Uncheck the Use Current Directory option as this is set by default to the Syniti DR install folder.
- 9. Click Select Directory.
- 10. In the Select Directory dialog, navigate to the folder containing the data files.
- 11. Select the folder and click **OK** in the dialog.

ODBC Text Setup	? X
Data Source Name:	ОК
Description:	Cancel
Database Directory: C:\Temp\FilesCSVsource	Help
Select Directory	
Use Current Directory	Options>>

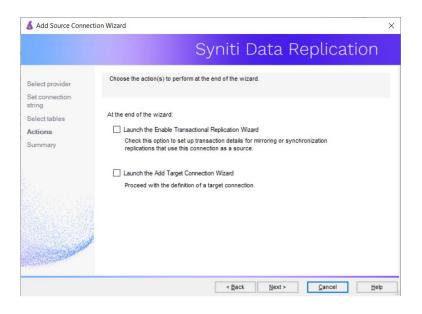
12. If needed, click **Options** in the ODBC Text Setup dialog to set the permissible file extensions for data files.

- 13. Click **OK** in the ODBC Text Setup dialog.
- 14. Click Next in the Set Connection String screen to display the Select Tables screen.
- 15. Select a file containing CSV data.

🔏 Add Source Connection Wizard		×
	Syniti Data Replication	
Select provider Set connection string	Expand the treeview and select the objects you want to replicate under the source connection.	
Select tables Actions Summary	Filter:	
	< <u>B</u> ack Next > Cancel Help	

16. Click Next.

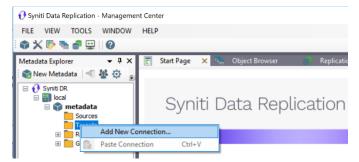
17. In the Actions screen, check the option Launch the Enable Transactional Setup Wizard.



18. Complete the wizard.

Set Up Target Connection

1. Choose Targets in the Metadata Explorer, then right-click to choose Add New Connection...



2. In the Target Connection Wizard **Provider** field, select the target provider and complete the target connection details.

Define the Replication

- 1. Choose the table you want to replicate in the Metadata Explorer, then right-click to choose **Replication > Create New Replication...**
- 2. In the **Define Replication Type** screen, type a name to identify the replication.
- 3. Optionally provide a description of the replication.
- 4. In the Replication Mode area, choose **Refresh**.

		Syniti Data Replication	
Replication type	Mirroring mode will defin server.	ne a one-way transactional replication, from the source server to the target	
	Replication Name		
ource log info	Replication Name	Customer	
arget connection	Description:		
	Use Group:		
lapping info		-	
cheduling	Replication Type		
ctions	O Refresh		
ummary	Continuous Mirror	rinn	
	0	my	
a constants	Synchronization		

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

💰 Create Replication Wiz	ard	>
		Syniti Data Replication
Replication type	Select the source conn	ection and table to be replicated.
Source connection		
Source log info		
Target connection	Connection Name:	B2iPubs V
Mapping info	Table Name:	TRAINING.CUSTOMERS
Scheduling		Open Table
Actions Summary		
		< <u>Back</u> <u>N</u> ext > <u>Cancel</u> <u>H</u> elp

- 6. Choose the CSV source name from the drop-down list that includes all the source connections you have created.
- 7. Choose the data file that you want to replicate from the drop-down list.
- 8. Click Next to go to the Select Target Connection screen.
- 9. Choose the target connection from the drop-down list that includes all the target connections you have created.
- 10. 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.

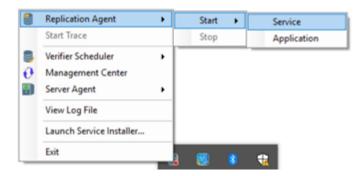
- Click Next to go to the Set Mapping Info screen.
 Source columns and target data with the same name are automatically mapped.
- 12. Set a start time for the replication. The **Start Time** field indicates the time at which the Replication Agent will begin considering the replication for execution.
- 13. 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.

- 14. Make sure the **Enable Replication** option is checked. This is required for the replication to run.
- 15. Click Next to go to the Summary screen.
- 16. 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 sin the Windows Notification Area.



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

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Last Updated on 11/30/21