# Syniti

## Data Replication

Microsoft Windows Cluster Setup Guide

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This guide describes how to set up Syniti Data Replication to run in mirroring mode in a two-node Microsoft Windows Server 2019 Failover Cluster. The steps assume that you are familiar with installing and configuring Syniti Data Replication in a normal single machine environment before attempting to set it up in a cluster.

This guide **does not** cover the installation and management of the Windows Cluster environment, including details of the set up for Failover and Roles. For more information, refer to the Microsoft article

#### Architecture

The diagram below shows two nodes in the cluster where Syniti Data Replication will be installed and the locations of the Syniti Data Replication Metadata and the Log Files Folder (both external to the cluster.)



#### Key Failover Concepts

Syniti Data Replication uses two main components running as Windows services: the **Server Agent** and the **Replication Agent**. If the Log Server Agent service is used to read logs for the source, then the Log Server Agent service needs to be running.

When Syniti Data Replication fails over from one system to another, the above three services are stopped on one node, and run on the other node. The **Failover Cluster Manager** is used to create a Cluster Role that contains the 3 services to run on either node when a failure occurs.

#### Main Requirements Summary

- A Microsoft Windows Server 2019 Failover Cluster with two nodes (Microsoft Windows Server 2012 and above supported).
- An external fail-safe database where Syniti Data Replication metadata is stored
- An external fail-safe hard-drive where the Log Server Agent's binary log files are stored
- .NET Data Providers for accessing the source, target and metadata databases

All other requirements are related to the setup of the Windows Failover Cluster and are not addressed in this document. Please refer to Microsoft documentation.

#### Setup Summary

Use the summary below to make sure that you complete all the setup steps for each node in the cluster.

Install a two-node Windows Server Failover Cluster (See <u>Microsoft</u> documentation)	<ul> <li>Install and configure a two-node Windows Server 2012 Failover Cluster using the Microsoft documentation</li> <li>Make sure the cluster is set up with all latest Windows updates and can be managed using the Failover Cluster Manager.</li> </ul>
Download and Install Syniti Data Replication on Node 1 (See <u>Download and</u> <u>Install Syniti Data</u> <u>Replication</u> below)	<ul> <li><u>Download Syniti Data Replication</u> (or obtain it from the technical support team via the <u>Help Center</u> if this is a special release)</li> <li>From the Management Center, open the Replication Agent Options (gear icon; topright on the Metadata Explorer), go to the Advanced Tab, and set Save Metadata Interval to 20.</li> <li>Restart the Syniti DR Server Agent.</li> </ul>
Set up Syniti Data Replication on Node 1 (See <u>Set up the</u> <u>Syniti Data</u> <u>Replication</u> <u>Environment</u> on Node 1 below)	<ol> <li>In the Syniti Data Replication Management Center:</li> <li>In the Metadata Explorer, create a metadata connection to an external failsafe database.</li> <li>In the Metadata Explorer, create a source connection.</li> <li>Check Use Transactional Replication.</li> <li>Fill out the required fields.</li> <li>Create a target connection.</li> </ol>

	6. Create a replication.
	7. Test the replication(s).
	8. Stop the Replication Agent Service, Server Agent, and Log Server Agent service (if used.)
	9. Use the Windows Control Panel to change the Startup Type of the three services from Automatic to Manual.
Download and Install Syniti Data Replication on Node	• Download <u>Syniti Data Replication</u> (or obtain it from the technical support team via the <u>Help Center</u> if this is a special release)
2	• In the DBMoto.server.config file, set SaveMetadataInterval to 20.
(See <u>Download and</u> <u>Install Syniti Data</u> <u>Replication</u> below)	
Set up Syniti Data	In the Syniti Data Replication Management Center:
Replication on Node 2 (See <u>Set up the</u>	<ol> <li>In the Metadata Explorer, create a metadata connection to the database used for Node 1.</li> </ol>
Replication	2. All connections and replications should be available from Node 2.
<u>Environment on</u> <u>Node 2</u> below)	3. If using the Log Server Agent for replication, install the LSA Service on node 2 by opening the Connection Properties and the Setup Info dialog.
	4. Test the replication(s).
	5. Stop the Replication Agent Service, Server Agent, and Log Server Agent service (if used.)
	6. Use the Windows Control Panel to change the Startup Type of the three services from Automatic to Manual.
Create a Failover	In the MS Windows Failover Cluster Manager:
Role in the Failover Cluster Manager	1. Configure a Generic Service Role for the Server Agent Service.
(See Set Up the	2. Add the <b>Replication Agent Service</b> and the Log Server Agent service (if used) as additional resources to the role.
<u>Failover Cluster</u> below)	3. Add a dependency to the <b>Replication Agent Service</b> to ensure that the <b>Server</b> <b>Agent Service</b> is started first.
	4. Start the role.
Test the Failover	In the MS Windows Failover Cluster Manager:
Cluster	1. Select the role on the current node.
<u>Cluster Operations</u>	2. Right-click and choose Move, then Select Node to specify the new node.
below)	3. Manually moving the role from one node to the other simulates what would happen in a failover situation.

# Download and Install Syniti Data Replication (Node 1 and Node 2)

NOTE: Complete this section on both Node 1 and Node 2 of your MS Windows Failover Cluster.

- 1. On the system where you plan to install Syniti Data Replication, make sure that you are running Microsoft .NET Framework 4.6 or above.
- 2. Download Syniti Data Replication.
- 3. In the registration form, be sure to put an email address where you can easily retrieve the registration key.
- 4. Unzip the downloaded file.
- 5. Once you have received the registration key via email, install the product using setup.exe.
- 6. Enter the license key information during installation.
- 7. Display the Syniti Data Replication install folder and locate the file DBMoto.server.config.
- 8. Open the file in a text editor.
- 9. In the optionList section, change the value of SaveMetadataInterval to 20.
- 10. Save the file.

#### Set Up the Syniti Data Replication Environment on Node 1

#### Set up the Metadata (Node 1 only)

**NOTE**: Complete this section on Node 1 of your MS Windows Failover Cluster to create a new metadata database. Then on Node 2, point to the same metadata database as described below.

Syniti Data Replication provides a default database (Microsoft SQL Server CE) for your metadata (all the information stored about your replication setup.) The default metadata database resides on the same system as the Syniti Data Replication installation. However, when using Syniti Data Replication in a Failover Cluster, it is critical to set up the metadata in a database external to the cluster that is always available. To set up a metadata in a different location:

1. Start the Management Center.



- 2. In the Metadata Explorer, right click on the local node and choose Add New Metadata.
- 3. In the Metadata Connection wizard, type a Metadata name and select the database type from the dropdown list. You are free to use any database you want for metadata, with the exception of IBM Db2 for i or IBM Db2 for z/OS.

NOTE: If you are setting up the metadata on Node 2, you should select the same settings as on Node 1.

🗴 Metadata Connectio	n Wizard		
		Syniti Data Replication	
elect provider	Select the da We recomme	abase that will contain the Syniti DR metadata tables and indicate which provider to use. Ind that you create and use a database exclusively for Syniti DR metadata tables.	
et connection ring	Metadata nam	3	
elect qualifier	Name:	ClusterMetadata	
efine metadata ctions	Data Provider	s)	
ummary	Database:	Microsoft SQL Server CE V	
	Provider:	Microsoft.NET Driver for SQL Server CE	
	Assembly:	SqlServerCe\System.Data.SqlServerCe.dll	
and the second		C Browse	
C. C		< Back Next > Cancel Hel	

4. Enter a value in the Assembly field as required for the database you selected.

- 5. Click Next.
- 6. In the Set Connection String screen, type the location of the database and any additional data required (for example, in some cases you need to supply a port number.) For more information, request a Syniti Data Replication Setup Guide that is specific to your database (available from the Syniti Technical Support team via the <u>Help Center</u>.)

NOTE: If you are setting up the metadata on Node 2, you should select the same settings as on Node 1.

Metadata Connection W	izard							
			Syniti D	ata I	Re	plic	cat	ion
elect provider	Spec	ify the connection parameter	rs for the metadata.					
et connection ring	Conne	ection properties						
lect qualifier	~	Required						
fine metadata		Data Source						~
	~	Password						
ons	*	Folist	Fals					
nmary		Encrypt	False					
		Mode	Read	Write				
		ExtendedProperties						
	Dat	ta Source e name or network address o	of the instance of SQL	Server to wh	ich to	connect.		
C.C.C.Laborator					2	Edit		Test
C. B.								
					-			-

- 7. Add the user ID and password for the database.
- 8. For all other providers, edit at least the Required connection properties by clicking in the property value field and typing a new value. The list of Optional properties for .NET and OLE DB providers contains the most commonly used properties for the providers. Edit these as needed. Note that some properties are displayed with default values (no bold text.) Any values that you add or edit are displayed in bold text. Check the documentation for your provider for a complete list of properties. You can set the value of the ExtendedProperties property to define additional property-value pairs. The syntax for defining property-value pairs is: prop1=val1;prop2=val2;....
- 9. Click Test to test the connection to the database server.
- 10. Click Next.
- 11. In the **Define Metadata** screen, check the most appropriate option. For this document, the assumption is that you are creating a new database when you set up Syniti Data Replication on Node 1. Once the database has been created for Node 1, you can point to the same database from Node 2. When you are working on Node 2, select the option **Open an Existing Database**.

💰 Metadata Connection	Wizard	×
	Syniti Data Replication	
Select provider Set connection string Select qualifier Define metadata Actions Summary	Determine if you want to create a new set of metadata or if you want to import metadata from a backup file. Define Metadata  © Create a new metadata database  Restore the metadata set from a backup file:	
	Open existing metadata database	
	< <u>B</u> ack <u>N</u> ext > <u>Cancel H</u> elp	•

- 12. Click Next, then complete the wizard.
- 13. In the Metadata Explorer, right click on the metadata that you just created and choose **Set As Default** from the menu.

Your new metadata database will be used for all subsequent operations on Syniti Data Replication.

- 14. In the Metadata Explorer, right click on the **local** node, and choose **Replication Agent Options** from the menu.
- 15. In the Replication Agent Options dialog, go to the Log tab.
- 16. Make sure that **Write Log to File** is selected, and specify a path to an external failsafe file location that can be accessed by both Node 1 and Node 2.
- 17. Click **OK** to complete the dialog.

C Trace	Alerts	🔀 Mail	Advance
🗲 General	-‡- Co	nversion Rules	[]≣ Log
Log Settings:		S	ettings
Write Log To:	File	~	
<ul> <li>Only One</li> <li>One File</li> <li>One File</li> <li>Keep Ma</li> <li>Log Files Pat</li> </ul>	e File. Every 0 ‡ With <u>S</u> ize Limited t x 10 ‡ L	Days. 10 🗘 M .og Files.	b.
Log			
Activate Lo	g History g <u>P</u> erformance		

#### Set up a Source Connection (Node 1 only)

1. Make sure you have a database connection via a .NET data provider to your source database:

- Install and configure one of the supported data access products. See <u>this Help Center article</u> for a current list of supported providers.
- From the data access product, 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 for the database connection has sufficient permissions to complete all operations in Syniti Data Replication. The user ID should have permissions to connect, select tables, insert/update/delete records. For complete details, see the **Syniti Data Replication Setup Guide** that is specific to your source database (available from the Syniti Technical Support team via the <u>Help Center</u>).
- 2. Start the Management Center.
- 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.

		Cupiti Data Daplication
		Syniti Data Replication
elect provider	Select the dat	tabase that contains source data to be replicated and indicate which provider to use.
et connection tring	Source name	
elect tables	Name:	OraSrc
tions ummary	Data Provider(s	\$)
	Database:	Oracie V
	Provider:	Cracle .NET Driver
	Assembly:	
	Assembly:	C Browse
	Assembly:	Browse
and the second	Assembly:	Browse

7. In the Select Provider screen, fill out the following fields:

#### Source Name

Type a name to identify the source connection. This name appears in the Metadata Explorer as a way to group connections for a specific replication.

#### Database

Select the source database from the drop-down list.

#### Provider

The value for the .NET Provider is displayed automatically. You do not need to change this value.

#### Assembly

Type the path to the provider DLL. If the value is not available, Syniti Data Replication displays a message when you continue in the Source Connection wizard, allowing you to go back and type in the path.

#### Example:

C:\oracle10\_2\client\odp.net\bin\2.x\Oracle.DataAccess.dll.

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.

	Sy	niti Data Repl	ication
elect provider	Specify the connection parameters for	the source connection.	
et connection	Connection properties		
elect tables	✓ Required		^
	Data Source		
tions	User ID		
mmary	Password		
	V Optional		
	Connection Timeout	15	
	Connection Lifetime	0	
	Statement Cache Purge	False	
	Statement Cache Size	0	
	Proxy User Id		
	Proxy Password		~
	Data Source Oracle Net Service Name that identifie	s the database to connect to.	

#### For Synchronization Replications:

The login/user ID that you provide must be unique to Syniti Data Replication. It should not be used for any transactions occurring in either database involved in the synchronization. Syniti Data Replication does not replicate transactions by the user you specify in this connection. This user ID is used by Syniti Data Replication during synchronization to read the database logs and perform the synchronization operations. Therefore, any transactions found in the logs with this user ID are not replicated as part of the synchronization data.

#### For Oracle Replications:

If you are replicating from Oracle using mirroring or synchronization, enter a user ID which will be exclusively used by Syniti Data Replication and has the authority to read the database transaction log (redo log.) See a detailed list of authorities needed.

The list of **Optional** properties for .NET and OLE DB providers contains the most commonly used properties for the providers. Edit these as needed. Note that some properties are displayed with default values (no bold text.) Any values that you add or edit are displayed in bold text. Check the documentation for your provider for a complete list of properties. You can set the value of the

ExtendedProperties property to define additional property-value pairs. The syntax for defining property-value pairs is: prop1=val1;prop2=val2;....

#### Edit

Click **Edit** to open a text entry window where you can paste or type a connection string for your provider. This is offered as an alternative to the Connection Properties grid, but should be used with great care because an error in the connection string can cause a connection to fail or to have unexpected properties. This window displays any connection information that you have already entered in connection string format. Note that default values are not displayed as part of the connection string.

#### Test

Click **Test** to make sure that the connection correctly opens a database connection.

9. In the Select Tables screen, choose the tables that you plan to replicate.

When creating a replication, you will be able to select an object for replication from those that you have chosen in this wizard. If you create multiple replications, you can select an object for each replication that you are defining. Use the **Select All Tables** and **Deselect All Tables** buttons to work with multiple tables. Use the **Hide System Tables** checkbox to limit the number of tables displayed.



Select a database owner/schema, then click this button to check all tables under the owner/schema.



Select a database owner/schema, then click this button to uncheck all tables under the owner/schema.

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



#### 11. Complete the wizard.

#### Enable Transactional Replication

This section assumes you are planning to replicate data to a target using mirroring (rather than Refresh) from a relational database. For Refresh replications, you do not need to complete the Enable Transactional Replication wizard. If you have checked the Source Connection wizard option to launch the Enable Transactional Replication wizard, follow the steps below. To open the wizard from the Management Center, choose the connection in the Metadata Explorer, then right-click to choose Transactional Setup > Enable...

#### In the Enable Transactional Replication wizard:

1. Select the type of transactional replication to use. The options depend on the source database and can include log reader, log server agent, triggers, plus log reader API (for IBM Db2 for i only). Check the help for more information on the best option.

If you choose the Log Server Agent option, you will need to set up some files in a path that is accessible to both nodes in the cluster.



 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</u> <u>Center</u>.

For the Log Server Agent, the Log Server Folder and Log Files Folder paths should be accessible from both nodes in the cluster.

- 3. Click **Next** to verify your settings against the source connection to the database. If any information is missing, you will not be able to proceed.
- 4. In the Actions screen, check the option to launch the Add Target Connection wizard.
- 5. Click Next to review your changes.
- 6. Click Finish to complete the wizard.

The source connection is now set up for transactional replications.

#### Create a Target Connection (Node 1 Only)

To create a target connection, either the Target Connection Wizard opens automatically because you selected that option in the last screen of the Enable Transactional Replication wizard, or you can select the **Targets** node in the Metadata Explorer.

Note that you must install, configure and test the connection to the database to which you are replicating before attempting to create a target connection to the database from Syniti Data Replication. For example, if you are replicating from Oracle to MySQL, you need .NET data providers installed and tested for both Oracle and MySQL.

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

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2. In the Target Connection Wizard, select the database to which you are replicating then follow steps to add a connection string and test the connection to the database.

If you are creating a connection to an Oracle database, refer to the steps above (<u>Source Connection</u>) for configuring the connection. Note that you do not need to configure the Setup Info screen unless you are planning to perform a synchronization replication using Oracle.

For all other databases, check this Help Center article before entering a value in the Assembly field.

💰 Add Target Connect	ion Wizard		;
		Syniti Data Replication	h
Select provider	Select the da	tabase target where to replicate data and indicate which provider to use.	
Set connection string	Target name		
	Name:	MySQLTgt	
Select tables	Data Provider	(\$)	
Actions Summary	Database:	SAP HANA	]
	Provider:	SAP Hana .NET Driver	]
	Assembly:		]
		Browse	1
Contractor and			
EXISTING			
		< Back Next > Cancel	lelp

3. Choose the tables to which you plan to replicate.

If a table does not exist, continue to the next screen without selecting a table. You can use the Create Target Table wizard once you have created the connection.

4. Complete the wizard.

#### Create a Target Table (Node 1 Only)

If you are replicating to a database where no target table exists, you need to create the target table before defining the replication. If the target table already exists in the database to which you are replicating, go to <u>Defining the Replication</u>. The Target Table wizard allows you to create tables from Syniti Data Replication but the target schema/owner etc. (depending on your database type) must have been created prior to running the wizard.

- 1. Expand the Syniti Data Replication tree to display the table that contains the data you want to replicate.
- 2. Select the table and drag it to the target connection name to open the Create Target Table wizard.



3. In the **Select Source Connection** screen, choose the source name from the drop-down list that includes all the source connections you have created.

💰 Create Target Table Wiz	ard				>
		Syniti D	ata Re	eplicat	ion
Source	Select the source table	to be copied.			
Target connection					
Define columns SQL script Actions	Connection Name:	Oracle-ERP			~
Summary	Table Name:	DEMO.CUSTOMERS			~ ~
and the second second				Open Table	
		< <u>B</u> ack	<u>N</u> ext >	<u>C</u> ancel	Help

- 4. Choose the table that you want to replicate from the drop-down list.
- 5. If you want more information about the table before proceeding, click Open Table....
- 6. Click Next to go to the Select Target Connection screen.

💰 Create Target Table Wiz	ard					×
		Sy	niti D	ata Re	eplicat	ion
Source connection	Select the target conne	ction and define t	he target table r	iame.		
Target connection Define columns SQL script Actions Summary	Connection Name: Database Name: Owner Name:	SqlServer DEMO				>
and the second second	Table Name:	CUSTOMERS				
			< Back	Next >	Cancel	Help

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

- 7. Type a name for the table you wish to create in the target database. This table will contain the replicated data.
- 8. Click Next to go to the Define Columns screen.

			S	vnit	ti Da	ata R	leplica	ation
				,			1	
rce connection	The table structure has context menu on the g	s been aut rid if you v	omat vant	ically gene to change	the table s	e source table structure.	e. Use the buttons	or the
et connection	able Structure							
	E+ E+ E+ 🔍 🧐	*			Cre	eate Table Rule	Automatic	~
ine columns	Field name	Type		Size	Precisi	Scale Nu	I Defaul	Identity
script	-1 CUSTOMERID	varchar	V	5	0	0 []		
ins	COMPANYNA	varchar	V	40	0	0 []		
many	CONTACTNA	varchar	~	30	0	0 🔽		
initially in the second s	CONTACTTI	varchar	~	30	0	0		
	ADDRESS	varchar	~	60	0	0 🔽		
	CITY	varchar	~	15	0	0 🔽		
	REGION	varchar	~	15	0	0 🔽		
and the second of the	POSTALCODE	varchar	~	10	0	0 🔽		
and a since	COUNTRY	varchar	~	15	0	0 🔽		
State State	PHONE	varchar	~	24	0	0 🔽		
and the second	FAX	varchar	~	24	0	0 🗹		
Contraction of the second								
State of the second sec								

- 9. Review the columns that will be created in the target table. You can add or remove columns as well as designate one or more columns as a primary key.
- 10. When you have finished editing the target table columns, click Next to go to the SQL Script screen.

	Syniti Data Replicatio	on
ource connection	The table script has been automatically generated in the table structure. Edit the text area if you change the table script.	want to
arget connection	Table Creation Script	
efine columns	<pre># # Create table CUSTOMERS</pre>	^
QL script	# create table DEMO, "dbo" CUSTOMERS	
tions	(	
mman	CUSTOMERID varchar(5) NOT NULL , COMPANYNAME varchar(40) NOT NULL ,	
anninary	CONTACTNAME varchar(30) NULL ,	
	CONTACTTITLE varchar(30) NULL , ADDRESS varchar(60) NULL ,	
	CITY varchar(15) NULL ,	
	REGION varchar(15) NULL , POSTALCODE varchar(10) NULL	
<b>国的。</b> 在14月1日	COUNTRY varchar(15) NULL ,	
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	PHONE varchar(24) NULL ,	
and the second	primary key(CUSTOMERID)	
Sale and the second	)	~
Constant and a second		

- 11. If necessary, edit the SQL script that generates the table.
- 12. Click Next to review the wizard settings in the Summary screen.
- 13. To create additional tables, check the option **Create another table**. This opens another Create Target Table wizard when this wizard is complete.
- 14. To go directly to creating a replication once this wizard is complete, check the option **Proceed with the Definition of a Replication**.

This opens the Replication wizard when the Create Target Table wizard is complete.

- 15. Click **Finish** to create the target table.
- 16. Note that the new table is not automatically displayed in the Metadata Explorer. Click **Yes** to add the newly created table to the list of target tables.

Syniti DR	Management Center	×
?	Do you want to add the created table to the tar	rget tables list?
🗌 Dor	't Show Again	Yes <u>N</u> o

#### Define the Replication (Node 1 Only)

This section explains how to create a single table-to-table replication. However, most real applications consist of many such replications and, if the replications use the same source and target databases, it may make sense to create a replication group to optimize database connection and log access times. Use the Help menu in the Management Center to find out more information about grouping 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 Continuous Mirroring.

		Syniti Data Replication	
Replication type	Mirroring mode will defin server.	ne a one-way transactional replication, from the source server to the target	
source connection	Replication Name		
Source log info	Replication Name	CUSTOMERS	
larget connection	Description:		
	Use Group:		
Mapping info			
Scheduling	Replication Type		
Actions	O Refresh		
Summary	Continuous Mirro	ring	
	Contailadas mirro	ing .	
	<ul> <li>Synchronization</li> </ul>		
and the second second			
and the second second			

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

💰 Create Replication Wiz	ard		;
		Syniti Data Replicatio	n
Replication type	Select the source conn	ection and table to be replicated.	
connection			
Source log info			
Target connection	Connection Name:	Oracle-ERP	
Mapping info	Table Name:	DEMO.CUSTOMERS V	r
Scheduling		Open Table	
Actions Summary			
Constant of		z Back Next > Cancel	Hala

- 8. Choose the source name from the drop-down list that includes all the source connections you have created.
- 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. The fields in this screen depend somewhat on the source database, but the Transaction ID, Transaction Timestamp and Read Interval fields are always present.

💰 Create Replication Wiz	rard	×
	Syniti Data Replication	
Replication type Source connection Source log info	Click Next to use the current transaction read point from the Oracle server. To override, click Read TID to set the transaction ID from which to replicate.	
Target connection Target log info Mapping info Scheduling Actions Summary	Service Name: Read TID Transaction ID: Transaction Timestamp: Read Interval (sec):	
	< Back Next > Cancel Help	

#### Transaction ID

The ID for the transaction at which you want to start replication. If you want to change the transaction ID, click **Read TID** to open the Read Point dialog. In this dialog, you can either retrieve the current transaction or the transaction for a specified date and time. If you enter a date and time, Syniti Data Replication retrieves the first transaction after the time entered. This information is available and can be changed in the Replication Properties dialog after the wizard is completed.

#### **Transaction Timestamp**

The timestamp for the transaction above.

#### Read Interval (sec)

The frequency (in seconds) with which you want to check the log during replication. For example, if the setting is 90 seconds, Syniti Data Replication will check the log every 90 seconds to see if any transactions have occurred that need to be replicated to the target table. This information is available and can be changed in the Replication Properties dialog after the wizard is completed.

- 12. In the Transaction ID field, click Read TID to open the Read Point dialog.
- 13. Choose either the current transaction or a transaction ID based on a time and date.
- 14. Click **OK** to add the value to the Source Log Info screen.
- 15. Set the value of the Read Interval field to the frequency with which you want Syniti Data Replication to check the transaction log for new events to mirror.
- 16. Click Next to go to the Select Target Connection screen.

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		Syniti Data Repl	ication
Replication type Source connection	Select the target conne	ction and table to be replicated.	
Source log info Target connection Target log info	Connection Name: Database Name:	SqlServer	~
Mapping info Scheduling	Owner Name:	dbo	~
Actions Bummary	nuno name.		)pen Table

- 17. Choose a target source name from the drop-down list that includes all the target connections you have created.
- 18. Choose the table to which you want to replicate from the drop-down list. If no tables are listed, you need to exit the wizard and add or create a target table.
- 19. If you want more information about the table before proceeding, click Open Table ....
- 20. Click Next to go to the Set Mapping Info screen.

			S	yniti I	Data	Replica	atio	n
Replication type	The mapping has target fields. Dra	s been autom g source fiel	atically ( ds to tar	generated using get fields or use	the default map the toolbar to e	ping rule to match s dit mappings.	ource and	
Source connection		<b>1</b> 11						
	IOracle-ERPI DEMO	CUSTOMER	s			[SalServer] DEMO.c	bo CUSTO	MERS
arget connection	Field name	Ordinal	^			Field name	Ordinal	T) ^
		01					01	VE
	COMPANYNA.	02				COMPANYNA.	. 02	Vž
Manning info	CONTACTNA.	. 03	- 1-		•	CONTACTNA	03	VE
apping into	CONTACTTITL	E 04	-			CONTACTTITLE	04	٧ŧ
cheduling	ADDRESS	05	-			ADDRESS	05	¥٤
ctions		06	×		•	CITY CITY	06	VE
ummary	<	CITY				<		>
	Field name	Ordinal: 6		Ordinal	Туре	Size		51
Real Proves	CUSTOMERID	Type: VARC	HAR2	1	varchar	5		
	COMPANYNA	Size: 15 Precision: 0		2	varchar	40		(
100 M	CONTACTNA.	Scale: 0		. 3	varchar	30		( ,
and the second second	<	Allow Nulls: Description:	True					>

Source and target columns with the same name are automatically mapped. You can also map columns by dragging the target column and dropping it on the source column, or you can map a column to an expression. For more information about mapping, check the Replication Wizard help topic. An alternative is to write a script to set mappings at runtime.

21. Click Next to go to the Scheduling screen.

Replication type   Source connection   Source log info   rarget log info   Start Time:   1/29/2021 < 10:25:49 AM   Start Time:   1/29/2021 < 10:25:49 AM     Refresh Schedule   Mapping info   Scheduling   Automation     Image: Connection     Add     Renove     Edit		Syniti Data Replication
Bounce log info   Farget connection     arget log info   Apping info   Scheduling   Actions   bummary     Add   Remove   Edit	Replication type	Set scheduling information for the replication.
arget log into       Refresh Schedule       Mirroring Schedule         lapping info       Image: Construction of the Const	ource log info arget connection	<ul> <li>✓ Enable Replication</li> <li>✓ Execute Initial Refresh</li> <li>Start Time: 1/29/2021 ✓ 10:25:49 AM </li> </ul>
Bummary Add Remove Edit	arget log into Mapping info <i>Scheduling</i> Actions	Refresh Schedule     Mirroring Schedule     Verifier Schedule         Run One Time Only          Run Recurrently:
Add Remove Edit	Bummary	
	and the state of t	Add Remove Edit

- 22. Make sure the Enable Replication option is checked. This is required for the replication to run.
- 23. 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.
- 24. Check the option to **Execute Initial Refresh** if needed. If you check this option, a full replication will be performed from the source to the target table, prior to starting the mirroring process where only incremental changes will be replicated.
- 25. Go to the Mirroring Schedule tab.
- 26. 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.
- 27. Click Next to go to the Summary screen.
- 28. Click Finish to complete the wizard.

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#### Set Up the Syniti Data Replication Environment on Node 2

#### Set up the Metadata

When setting up Syniti Data Replication on Node 1 of your MS Windows Failover Cluster, you created a new metadata database. Now, on Node 2, you will point to the same metadata database as described below. DO NOT create a new database here because the two instances of Syniti Data Replication must share the same metadata.

1. Start the Management Center.



- 2. In the Metadata Explorer, right click on the local node and choose Add New Metadata.
- 3. In the Metadata Connection wizard, type a Metadata name and select the database type from the dropdown list.

NOTE: If you are setting up the metadata on Node 2, you should select the same settings as on Node 1.

💰 Metadata Connectio	n Wizard					
		Syr	iti D	ata Re	eplicat	ion
Select provider	Select the da We recomme	atabase that will contain the Sy and that you create and use a d	niti DR metad latabase exc	ata tables and ind lusively for Syniti	licate which provide DR metadata tables	er to use. I.
et connection ring	Metadata nan	ne				
elect qualifier	Name:	Clusterlifetadata			7	
efine metadata					-	
ctions	Data Provider	(s)				
ummary	Database:	Microsoft SQL	Server CE			~
	Provider:	Microsoft.NET Dr	iver for SQL	Server CE		~
	Assembly:	SqlServerCe\System.0	ata.SqlServe	erCe.dll		
						Browse
C. C						
All Street and a second second						

- 4. Enter a value in the Assembly field as required for the database you selected.
- 5. Click Next.
- 6. In the Set Connection String screen, choose Select Existing Database from the drop-down menu (if using MS SQL Server CE) or type the location of the database and any additional data required (for example, in some cases you need to supply a port number.) Be sure to select the same settings as on Node 1.

		Syniti Data Replication
ect provider connection	Specify the connection parame	iters for the metadata.
ng	Connection properties	
ne metadata	Data Source Password	Select Existing Database
ons Imary	Optional     Enlist     Encrypt	Create New Database Taise
	Mode ExtendedProperties	Read Write
	Data Source The name or network addres	s of the instance of SQL Server to which to connect.
and the second		🙎 Edit 💷 Test

- 7. Add the user ID and password for the database.
- 8. For all other providers, edit at least the Required connection properties by clicking in the property value field and typing a new value. The list of Optional properties for .NET and OLE DB providers contains the most commonly used properties for the providers. Edit these as needed. Note that some properties are displayed with default values (no bold text.) Any values that you add or edit are displayed in bold text. Check the documentation for your provider for a complete list of properties. You can set the value of the ExtendedProperties property to define additional property-value pairs. The syntax for defining property-value pairs is: prop1=val1;prop2=val2;....
- 9. Click Test to test the connection to the database server.
- 10. Click Next.
- 11. In the Define Metadata screen, select the option Open an Existing Database.
- 12. Select the metadata database that was created for Node 1.

💰 Metadata Connection	Wizard	×
	Syniti Data Replication	
Select provider Set connection string Select qualifier Define metadata Actions Summary	Determine if you want to create a new set of metadata or if you want to import metadata from a backup file.  Define Metadata	
in the second second	Open existing metadata database	
	< <u>B</u> ack <u>N</u> ext > <u>Cancel H</u> el	>

- 13. Click Next, then complete the wizard.
- 14. In the Metadata Explorer, right click on the metadata that you just created and choose Set As Default from the menu.

Your new metadata database will be used for all subsequent operations on Syniti Data Replication.

- 15. In the Metadata Explorer, right click on the local node, and choose **Replication Agent Options** from the menu.
- 16. In the Replication Agent Options dialog, go to the Log tab.

- 17. Make sure that **Write Log to File** is selected, and specify a path to an external failsafe file location that can be accessed by both Node 1 and Node 2.
- 18. Click **OK** to complete the dialog.

C Trace	Alerts	🔀 Mail	Advanced
Seneral General	-Ş- Co	nversion Rules	[2≣] Log
Log Settings:		<u>s</u>	ettings
Write Log To:	File	~	
<ul> <li>One File E</li> <li>One File V</li> <li>Keep Max</li> <li>Log Files Path</li> </ul>	ivery 0 ‡ With Size Limited t 10 ‡ L	Days. to <u>10</u> IM	b.
Log			
Activate Log	History <u>P</u> erformance		

#### Test the Source Connection

- 1. Make sure you have a database connection via a .NET data provider to your source database:
  - Install and configure one of the supported data access products. See <u>this Help Center article</u> for a current list of supported providers.
  - From the data access product, 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 for the database connection has sufficient permissions to complete all operations in Syniti Data Replication. The user ID should have permissions to connect, select tables, insert/update/delete records. For complete details, see the **Syniti Data Replication Setup Guide** that is specific to your source database (available from the Syniti Technical Support team via the <u>Help Center</u>).



- 2. In the Metadata Explorer, expand the metadata node to view the Sources and Targets nodes.
- 3. Select the Sources node.
- 4. From the right mouse button menu, choose Connection Properties.
- 5. In the Connection Properties dialog, click **Test** to make sure that the connection correctly opens a database connection.
- 6. If the connection does not work, check that you have installed the correct .NET Provider. Test the provider using the tools included with the provider. For any other issues, contact the Technical Support Team via the Help Center.
- 7. When testing is successful, click **OK** to close the Connection Properties dialog.
- 8. If you selected **Log Server Agent** as the Transactional Replication mode on Node 1, you need to install the Log Server Agent Service on Node 2 so that Syniti Data Replication can access the log.
- 9. On Node 2, in the Metadata Explorer, right click on the source connection and choose **Transactional Setup** then **Enable**....
- 10. In the Enable Transactional Replication wizard, choose the Log Server Agent option.

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💰 Enable Transactional I	Replication Wizard	>
	Syniti Data Replication	
Log Type Log Settings Agent Settings Agent Scheduling	Choose the appropriate type of logging for this connection. For more information, see <u>Choosing a Log</u> <u>Type for Transactional Replications</u> Log Type O Log Reader	
Actions Summary	[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 DR.	
	Log Server Agent 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.	
Carlo	<ul> <li>Triggers</li> <li>Every replication will create a trigger on the database to log data from committed transactions. Choose this option if you plan to add a limited number of replications and you can allow changes to the source database.</li> </ul>	
	< <u>Back</u> <u>N</u> ext > <u>Cancel</u> <u>H</u> el	lp

- 11. Follow the Enable Transactional Replication Wizard to install the Log Server Agent Service.
- 12. The Log Server Folder and Log Files Folder paths should be accessible from both nodes in the cluster.

		S	yniti D	ata I	Replica	atio	n
.og Type .og Settings Agent Settings Agent Scheduling	Specify folders to con Windows Service. For Log Server Agent Settin Log Server Folder	tain configuratio r Oracle 12, opti ngs	on and log files, a pre onally specify Log C	efix for log fik ontainer deta	e names and a name ils.	e for the	
ctions	Log Files Folder: Prefix:		Log File Size	10 🜩	Keep Max Files:	50	 ÷
	Use Log Contain Server User - Password Use Remote LSA. Windows Service: Prefix: S	er 10.60.10.67/ dbmoto Address / Por	t		1		
and the second second	Name: S	rniti_LSA_ ter completing the	he wizard				
			< <u>B</u> ack	<u>N</u> ext >	Cancel		Help

#### Test the Target Connection

Note that you must install, configure and test the connection to the database to which you are replicating before attempting to create a target connection to the database from Syniti Data Replication. For example, if you are replicating from Oracle to MySQL, you need .NET data providers installed and tested for both Oracle and MySQL.

- 1. In the Metadata Explorer, right click the target connection and choose **Connection Properties** from the menu.
- 2. In the Connection Properties dialog, click **Test** to make sure that the connection correctly opens a database connection.
- 3. If the connection does not work, check that you have installed the correct .NET Provider. Test the provider using the tools included with the provider. For any other issues, contact the Technical Support Team via the Help Center.
- 4. When testing is successful, click **OK** to close the Connection Properties dialog.

#### Test 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 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 S
- 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 the Syniti Data Replication Services (Node 1 and Node 2)

Syniti Data Replication uses a minimum of two or three Windows services:

Syniti Replication Agent

Syniti Server Agent

Syniti\_LSA\_xxx (only present if the Log Server Agent has been selected as the transactional replication type.)

The services on both nodes must be managed by the Failover Cluster Manager as follows.

- 1. In the Windows Notification Area, right click on the Service Monitor icon S. From the menu, choose **Replication Agent** then **Stop**.
- 2. Right click on the Service Monitor icon 🕌. From the menu, choose Server Agent then Stop.
- 3. If you selected Log Server Agent as your transactional replication mode, stop the LSA service you created:
  - In the **Metadata Explorer**, right click on the source connection name and choose **Transactional Setup** then **Manage**....
  - Click Stop to stop the service.
- 4. On the Windows desktop, open the Control Panel.
- 5. Open the Services window from Administrative Tools.
- 6. Change the Startup Type of the three Syniti Data Replication services from Automatic to Manual.
- 7. Repeat these steps on the other node.

This is the first step to allowing the Failover Cluster Role to manage the services later.

Use the Failover Cluster Manager to create a failover role for the three Syniti Data Replication services.

#### Set Up the Failover Cluster

- 1. Open the Failover Cluster Manager.
- 2. Under the cluster name, right click on Roles > Configure Roles...

📲 Failover Clust	er Manager	
File Action V	ïew Help	
-		
Value Cluster Cluster ← 🙀 😽 🗸	r Manager DNCLSTR1.hitsw.	Cluster Manager
Re'	Configure Role	frate failover clusters, validate hardware tor potential failover clusters, and perform figuration changes to your failover clusters.
> 📇 St 🖺 N	Virtual Machines >	- continue
i ci	Create Empty Role	cluster is a set of independent computers that work together to increase the availability of
	Refresh	b. The clustered servers (called nodes) are connected by physical cables and by software. If nodes fails, another node begins to provide services. This process is known as failover.
	Help	
	$\odot$	Clusters

3. In the High Availability Wizard Select Role screen, choose Generic Service.

igh Availability	Wizard			×
Select Ro	ble			
Before You Begin Select Role	Select the role that you want to configure for high av-	ailability:		
Select Service Client Access Point Select Storage Replicate Registry Settings Confirmation Configure High Availability Summary	DFS Namespace Server DHCP Server Distributed Transaction Coordinator (DTC) File Server Generic Script Generic Script Hyper-V Replica Broker CSCSI Target Server	~	Description: You can configure high availability for some services that were not originally designed to run on a cluster. For more information, see <u>Configuring Generic</u> <u>Applications</u> , <u>Scripts</u> , and <u>Services</u> .	
		< <u>P</u> re-	vious <u>N</u> ext > Cancel	

- 4. Click Next.
- 5. In the Select Service screen, choose the Syniti Server Agent Service.

Before You Begin	Select the service you want to use from the list	•	
Select Role Select Service	Name	Description	^
lient Access Point	Storage Service	Provides enabling services for storage settings	
	Storage Tiers Management	Optimizes the placement of data in storage tiers	
elect Storage	Syniti Replication Agent	Replicates relational data based on settings pro	
Replicate Registry	Syniti Server Agent	Provides support to the Syniti DR Management	
ettings	Syniti Verifier Scheduler	Manages scheduled verifications of replications	
onfirmation	SysMain	Maintains and improves system performance ov	
Configure High	System Event Notification Service	Monitors system events and notifies subscribers	
vailability	System Events Broker	Coordinates execution of background work for	
ummary	System Guard Runtime Monitor Broker	Monitors and attests to the integrity of the Wind	Y

- 6. Click Next.
- 7. In the Client Access Point screen, specify a role name. This guide uses DBMOTO\_ROLE as an example.

High Availability	Wizard cess Point	×
Before You Begin Select Role Select Service Client Access Point Select Storage Replicate Registry Settings Configure High Availability Summary	Type the name that clients will use when accessing this clustered role:         Name:       DBMOTO_ROLE         Image:       DBMOTO_ROLE         Image:	

8. Complete the wizard.

퉳 High Availability	Wizard	:
Summary	,	
Before You Begin Select Role	High availability was successfully configured for the role.	
Select Service	Suniti Server Agent (SunitiDR ServerAgent)	•
Client Access Point	Network Name	^^
Select Storage	DBMOTO ROLE	
Replicate Registry	OU	
Settings	CN=Computers,DC=hitsw,DC=com	
Confirmation	IP Address	
Configure High	DHCP address on 10.60.10.0/24	
Availability	Warnings	
Summary	* The only nodes with the resource type that supports this role are WS19-ALWON-SQL1.	
		<b>~</b>
	To view the report created by the wizard, click View Report. To close this wizard, click Finish.	<u>V</u> iew Report
		Dit
		<u>F</u> inish

- 9. Add the Replication Agent Service and the Log Server Agent service (if used) as additional resources to the role you have created.
- 10. Stop the role if it was started.
- 11. Right click on the role name to select Add Resource then Generic Service.

🕌 Failover Cluster Manager							
<u>File Action V</u> iew <u>H</u> elp							
🕨 🧼 🖄 📰 📰							
📱 Failover Cluster Manager	Roles (2)						
VS19ALWONCLSTR1.hitsw.	Search				P	Queries 🔻 🖵 🔻	
Roles	Name		Status	Type		Owner Node	Pric
> 🛃 Storage	DBMOTO ROLE		Pupping	Generic Servic	e	WS19-ALWON-SQ	Me
Networks		1	Start Role				
Cluster Events		<b>G</b>	Stop Role				
			Move	۲			
		٩	Change Startup Pri	ority 🕨			
		8	Information Details	5			
		3	Show Critical Event	ts			
		4	Add Storage				
		R	Add Resource	•	C	lient Access Point	
			More Actions	۰,	G	eneric Application	
		×	Remove		G	eneric Script	
					G	eneric Service	
			Properties		M	lore Resources	

12. In the Select Service screen, choose the Syniti Replication Agent Service.

🖆 New Resource Wi	izard		×
Select Se	ervice		
Select Service	Select the service you want to use from the list		
Confirmation			
Configure Generic	Name	Description	^
Service	Storage Service	Provides enabling services for storage settings	
Summary	Storage Tiers Management	Optimizes the placement of data in storage tiers	
	Syniti Replication Agent	Replicates relational data based on settings pro	
	Syniti Verifier Scheduler	Manages scheduled verifications of replications	
	SysMain	Maintains and improves system performance ov	
	System Event Notification Service	Monitors system events and notifies subscribers	
	System Events Broker	Coordinates execution of background work for	
	System Guard Runtime Monitor Broker	Monitors and attests to the integrity of the Wind	~
	Laroer Manader	Allows Fallover Cluster service to manage prota	
		Next > Cancel	

#### 13. Click Next.

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🚰 New Resource V	Vizard X
Confirmation Confirmation	ation
Select Service Confirmation	You are ready to make a Generic Service.
Configure Generic Service	Registry Keys
Summary	To continue, click Next.
	< Previous Next > Cancel

#### 14. Complete the wizard.

New Resource Wi	zard	×
Summary		
Select Service Confirmation	The new resource was successfully created and configured.	
Configure Generic Service Summary	Service Syniti Replication Agent (SynitiDR_ReplicationAgent)	
	To view the report created by the wizard, click View Report. To close this wizard, click Finish.	

15. Repeat steps 10 to 13 to add the Log Server Agent service (Syniti\_LSA\_xxx), if used.

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The Replication Agent Service depends on the Server Agent to be running before it can start, so you need to add dependency to the Replication Agent service in the Failover Cluster Manager.

- 16. Display the role in the bottom pane of the Failover Cluster Manager.
- 17. Right click on the Replication Agent Service and choose Properties from the menu.

V Controrrole		Preferred Owners: Any node
Name	Status	Information
Server Name		
🗉 📑 Name: DBMOTO_ROLE	💿 Online	
Roles		
😫 Syniti Server Agent	Online	
Syniti Replication Agent	Coline Bring Online Take Offline Information Details Show Critical Events More Actions	•
	Kemove	
	Properties	

18. On the Properties Dependencies tab, add Syniti Server Agent as a dependency.

	Advanced F	'olicies	Registry R	eplication	
General		Dependencies		Policies	
pec e br	ify the resource rought online:	es that must be brought onlin	ne before tł	nis resource can	
	AND/OR	Resource			
		Syniti Server Agent		```	
8	Click here to a	dd a dependency			
			Insert	Delete	

19. Click **OK** to complete the dialog.

The critical Syniti Data Replication services are now controlled by the role you have created in the Failover Cluster Manager. To start all the services for replication, and for working in the Syniti Data Replication Management Center, start the role. Note that, if the role is stopped, no replications in Syniti Data Replication Replication can occur because the Syniti services are also stopped.

#### Start the Role (Node 1 or Node 2)

Now that the failover role is set up, you can use it to start, stop the services and test failover by moving the role to the other node on the cluster. It is highly recommended that you control the Syniti services from the Failover Cluster Manager, rather than from the Windows Control Panel or the Syniti DR Service Monitor.

• In the Failover Cluster Manager, right click on the role and choose Start Role.

📲 Failover Cluster Manager								
File Action View Help								
📲 Failover Cluster Manager	Roles (2)							
V S19ALWONCLSTR1.hitsw.	Search Queries V							
📷 Roles								
🙀 Nodes	Name	Status	Туре	Owner Node	Priority			
> 📇 Storage	C DBMOTO_ROLE		Gaparia Santian	WS19-ALWON-SQ	Medium			
i Networks		G Start Role		WS19-ALWON-SO Medium				
Cluster Events		🕼 Stop Role		W3137/EW014-5Q	Mediam			
		Move	•					
		🔞 Change Star	tup Priority 🔹 🕨					

#### Test Failover Cluster Operations

To test the failover, use the Failover Cluster Manager to move the role from one cluster node to the other, simulating a failover situation. A failover role can run on either node: the Failover Cluster Manager displays the current role status and can be used to move a role from one node to another.

• In the Failover Cluster Manager, right click on the role and select **Move** from the menu, then choose **Select Node...** to select a new node to move/failover the role.



Last Updated on 11/30/21