



Data Replication

Microsoft SQL Server Always On Configuration

Version 9.8.2



Syniti Data Replication

Table of Contents

Overview	1
Environment	1
Configure the Replication Environment	2
1. Configure a Remote Distributor	2
2. Configure Distribution at the Primary Replica	9
3. Configure Distribution for the Secondary Replica	11
4. Set Log Reader Agent PublisherFailoverPartner Property	11
5. Add Linked Servers to Secondary Replicas	16
6. Configure the SQL Server Connection in Syniti Data Replication	17
7. Add Replications and Create the Publication Database	21
8. Redirect the Publisher to the AG Listener Name	21
Test the Configuration	22
Notes	22

Syniti Data Replication

Overview

This document gives detailed steps on setting up transactional replications on a Microsoft SQL Server database that is part of an Always On Availability Group. It uses the environment described below as an example.

For a full explanation of Availability Groups and the Always On concept, refer to Microsoft SQL Server documentation, for example [Overview of Always On Availability Groups \(SQL Server\)](#). Here is a brief overview as it relates to setting up Always On Availability Groups with Syniti Data Replication.

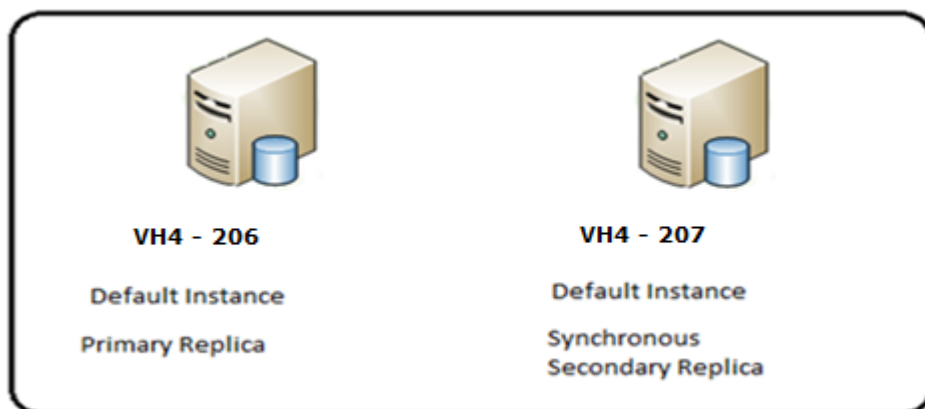
In a Microsoft SQL Server environment, an availability group can provide a failover environment for a set of user databases by supporting a set of primary databases and one to eight sets of secondary databases. Each set of availability database is hosted by an availability replica. A single primary replica hosts the primary databases, and one to eight secondary replicas, which host a set of secondary databases that serve as potential failover targets for the availability group. The use of Always On Availability Groups requires the establishment of a Windows Server Failover Clustering (WSFC) cluster. Each availability replica within an availability group resides on a different node of the same WSFC cluster.

Environment

The example used to explain how to set up and use an Always On Availability Group with Syniti Data Replication is described below.

The initial Always On SQL Server environment:

- VH4-206: Synchronous Replica – Current Primary
- VH4-207: Synchronous Replica
- Availability Group: TEST1_AG
- AG database: AGTest1
- AG Listener: TEST1_AG_Listen (192.168.1.81, port 1433)
- Cluster name: AGTestcluster

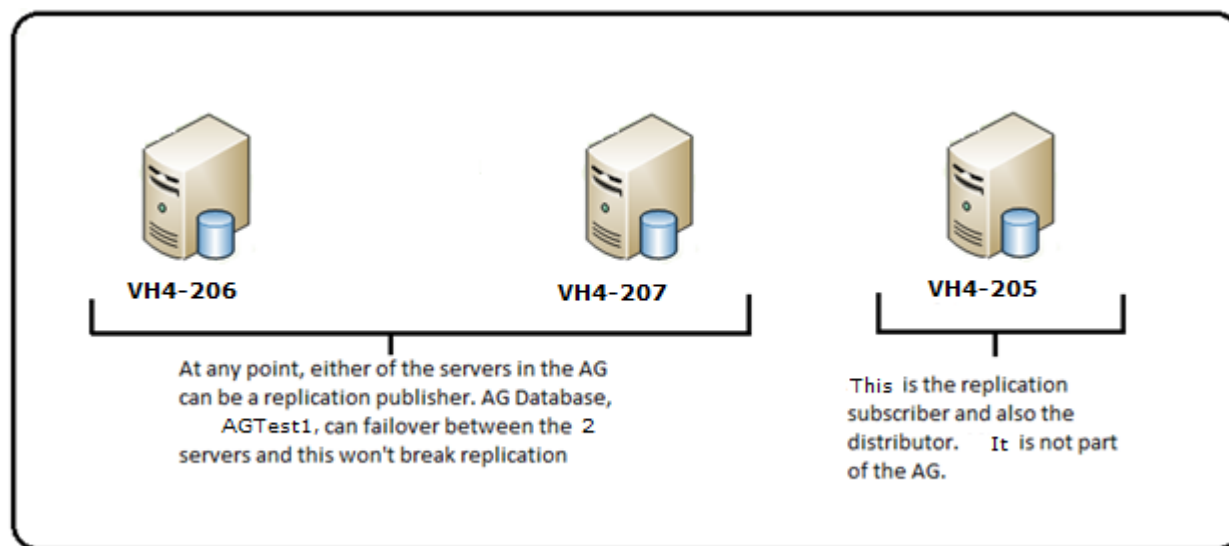


Syniti Data Replication

The environment setup for replication with Syniti Data Replication:

- VH4-206: Original Publisher
- VH4-207: Publisher Replica
- VH4-205: Distributor

NOTE: Do not set a distributor on any of the publishers in this case as the failover of a distributor is not supported.



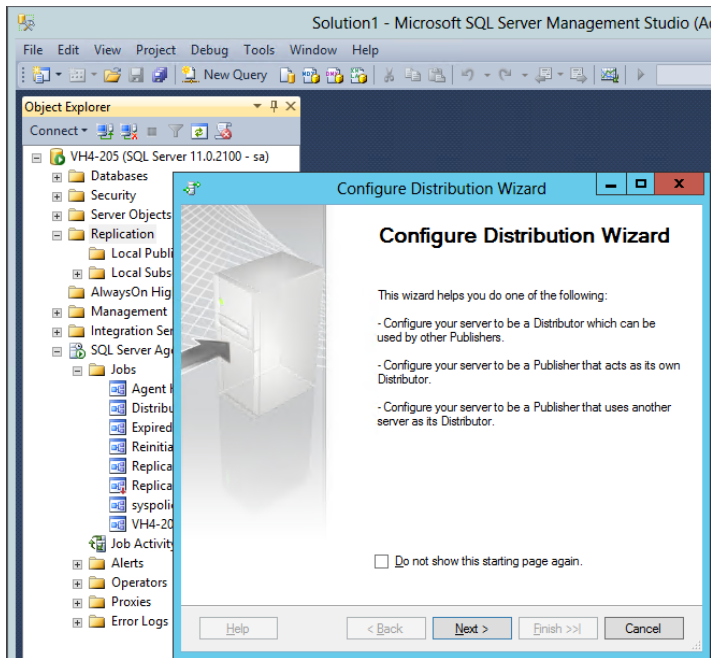
Configure the Replication Environment

1. Configure a Remote Distributor

To connect to VH4-205 from MS SQL Server Management Studio:

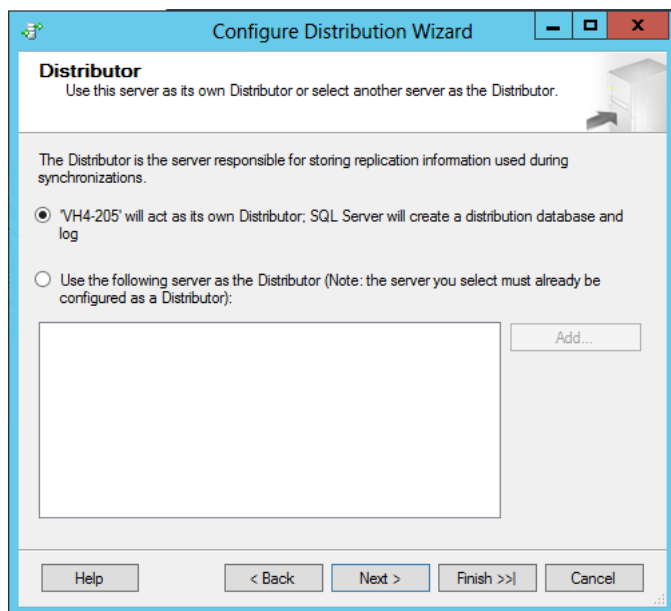
Syniti Data Replication

1. Right click **Replication** and select **Configure Distribution**.

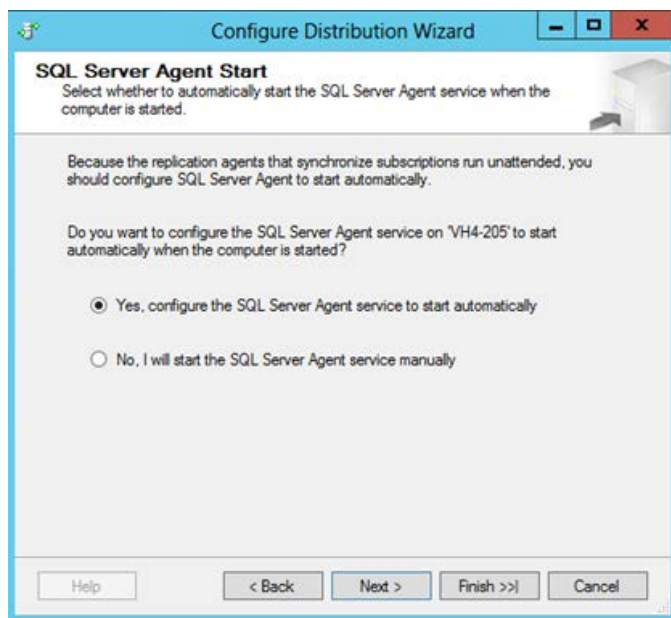


2. Select the first option to set up VH4-205 as distributor:

Syniti Data Replication



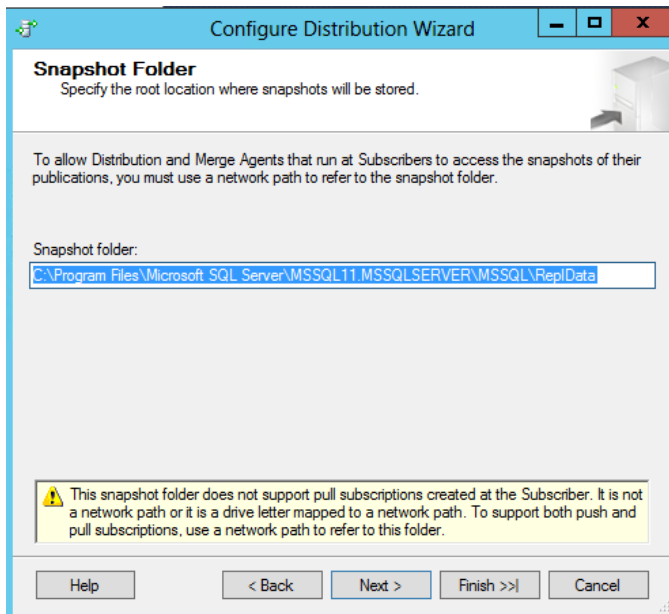
3. Click **Next**.
4. The Server Agent should be started automatically.



5. Click **Next**.

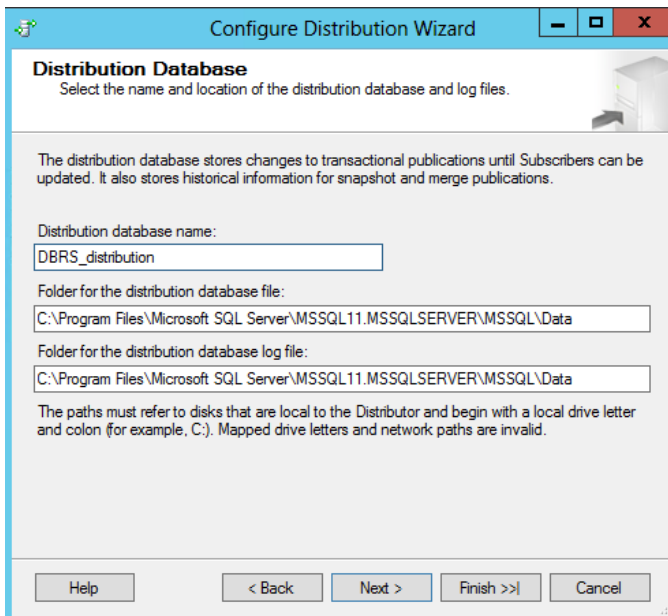
Syniti Data Replication

- Specify the **Snapshot Folder** location:

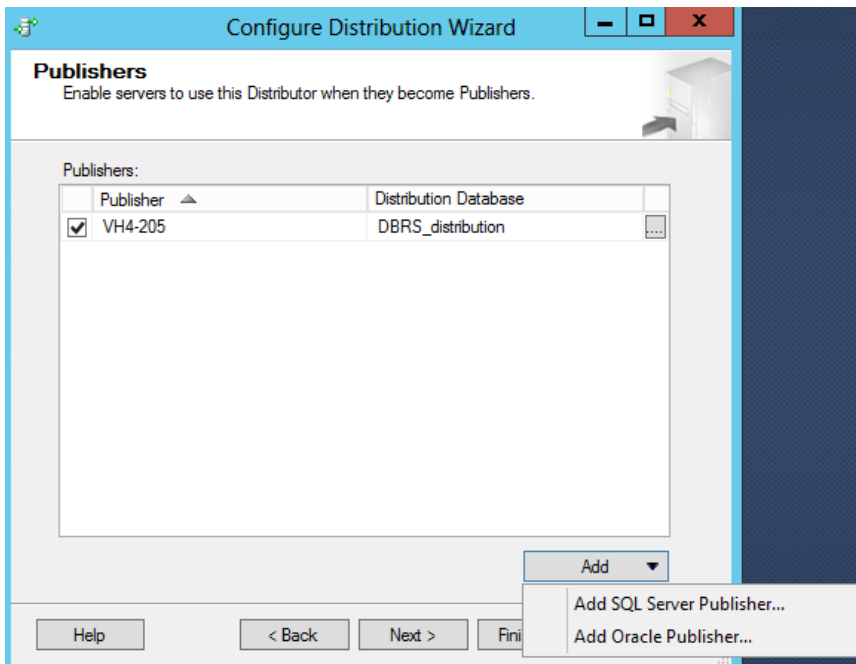


- Click **Next**.
- Name the distributor 'DBRS_distribution' and specify the path for the database file and database log file:

Syniti Data Replication

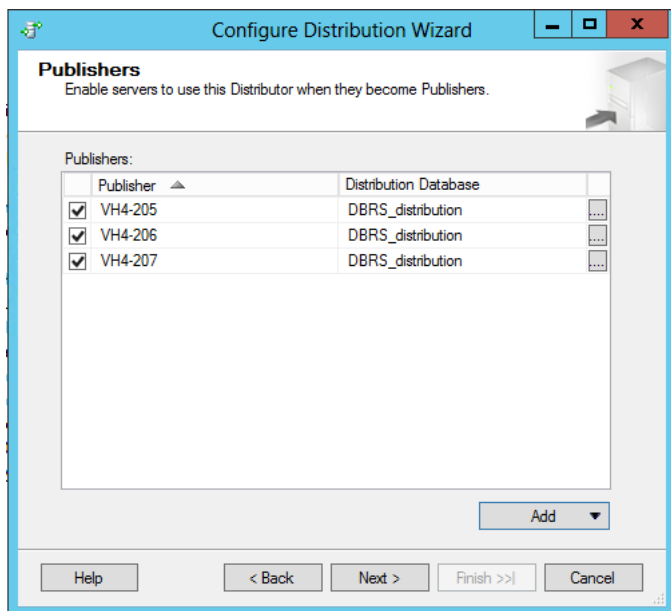


9. Click **Next** to specify VH4-205, VH4-206 and VH4-207 as publishers.



Syniti Data Replication

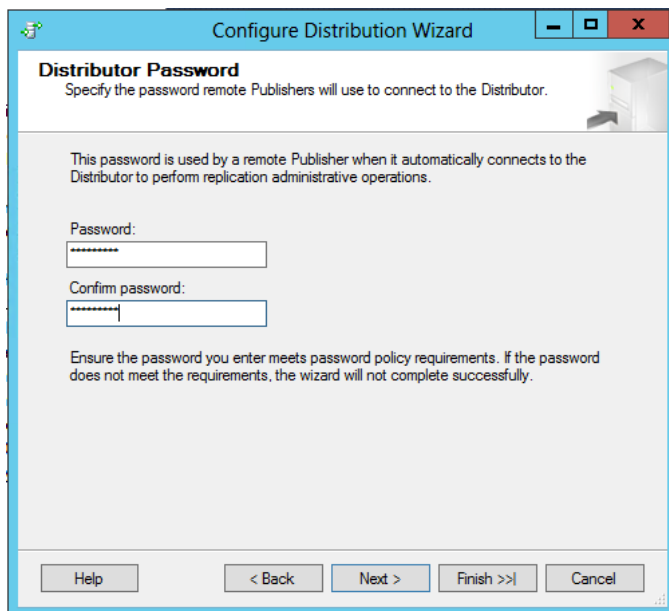
10. Click **Add**, then **Add SQL Server Publisher** to connect to each server that will act as publisher. Note that VH4-205 already exists in the list and you can choose to leave it that way.
11. Check that your screen looks like the one below after adding the servers.



12. Click **Next**.

Syniti Data Replication

13. Enter the password that the publishers will use to connect to the distributor:



NOTE: This password is used internally between publishers and distributor. Make a note of it as you will need to use it again when configuring a new publisher.

14. Click **Next**, then select **Configure distribution**.

15. Click **Next**.

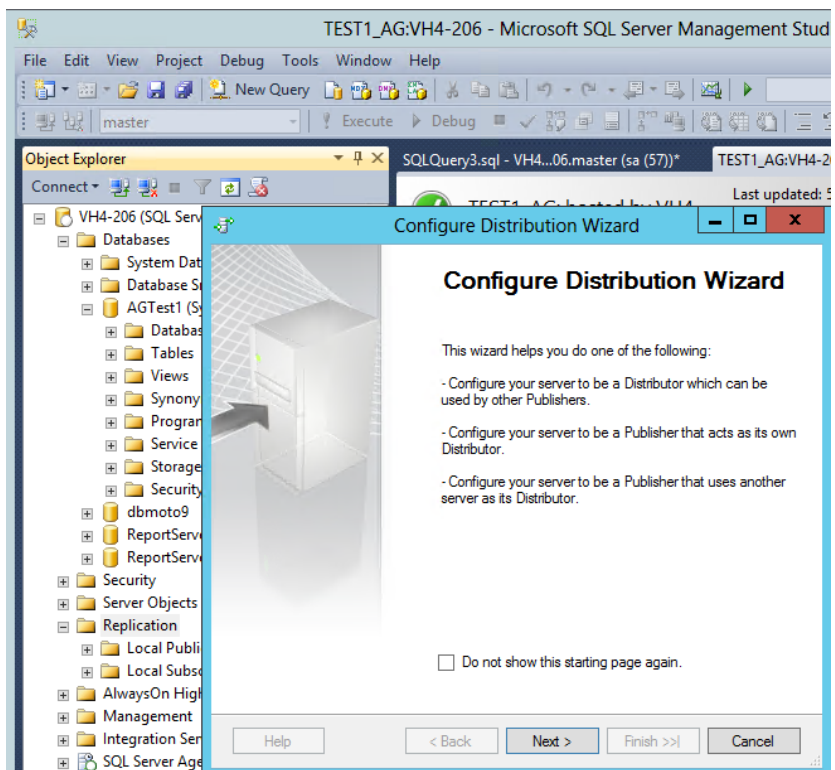
16. Click **Finish** to complete the wizard.

Now the distributor is successfully set up.

Syniti Data Replication

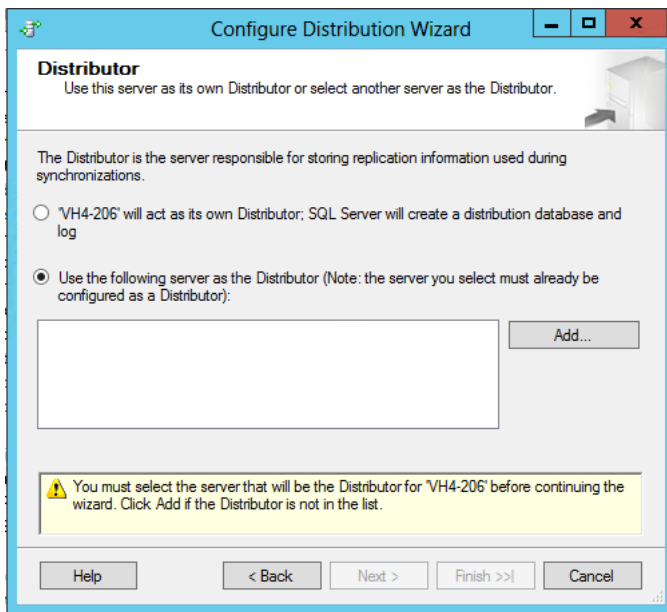
2. Configure Distribution at the Primary Replica

1. Connect to the primary replica, VH4-206:
2. Right click **Replication** and select **Configure Distribution**:

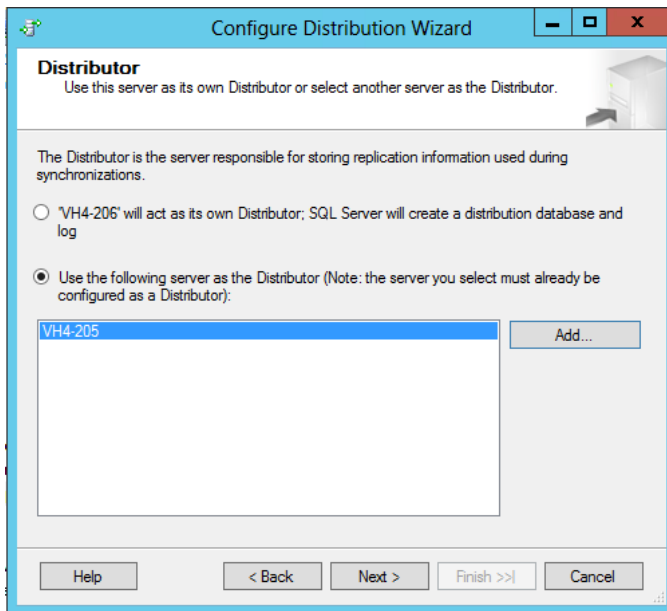


Syniti Data Replication

3. Select the option to connect to another server as the remote distributor.

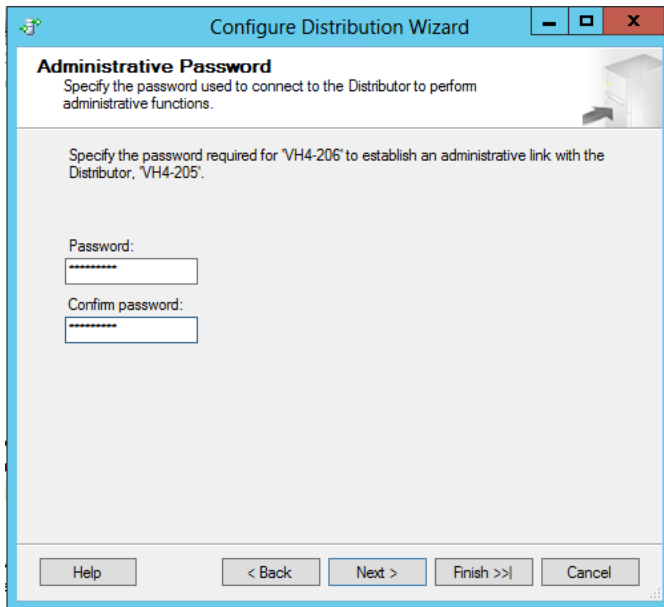


4. Click **Add** and select VH4-205.



Syniti Data Replication

5. Type the same password used earlier to configure the distributor:



6. Click **Next**.
7. Select **Configure distribution**.
8. Click **Next**.
9. Click **Finish** to complete the wizard.

Now the remote distributor is successfully set up.

3. Configure Distribution for the Secondary Replica

To connect to the secondary replica, VH4207, repeat the same steps as for the primary replica.

NOTE: If the distributor is being used by multiple publishers, steps mentioned in Section 4 below can be skipped, please perform step in section 8 first and then continue with steps 5 onwards.

4. Set Log Reader Agent PublisherFailoverPartner Property

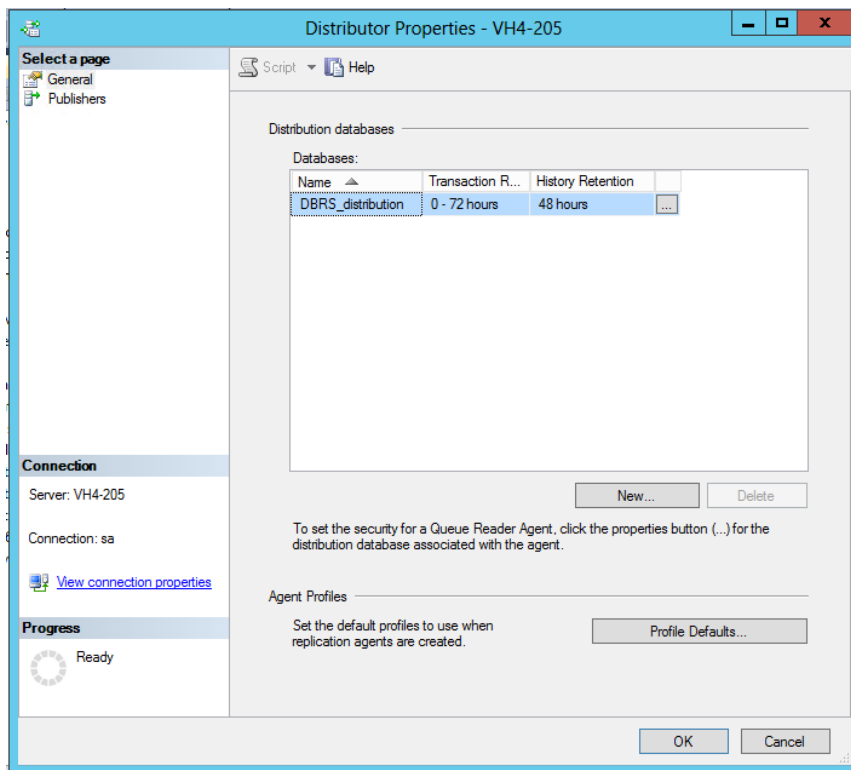
The SQL Server Log Reader Agent is set up to monitor the transaction log on the primary publisher, VH4-206. In case of failover to VH4-207, the agent job cannot be switched to pick up changes from the secondary (now primary) replica, unless the PublisherFailoverPartner property is set to VH4-207. This is the failover partner instance participating in a database mirroring session with the publication database. On failover, the publisher of the secondary replica will start to replicate to the remote distributor.

1. Connect to the distributor, VH4-205.

Copyright© 2022 by BackOffice Associates, LLC d/b/a Syniti and/or affiliates. All Rights Reserved. This document contains confidential and proprietary information and reproduction is prohibited unless authorized by Syniti. Names appearing within the product manuals may be trademarks of their respective owners.

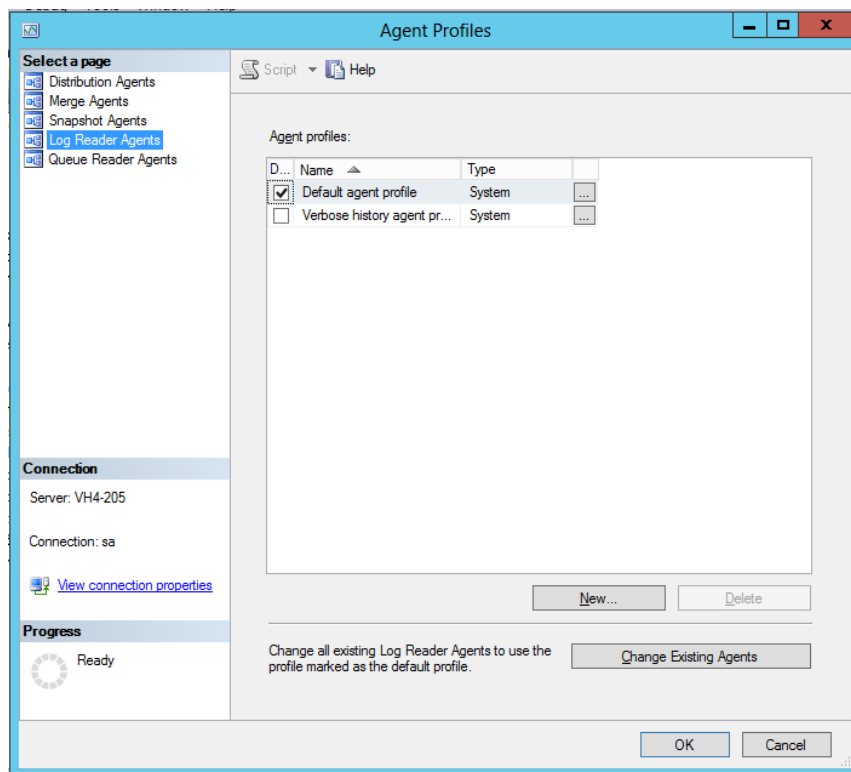
Syniti Data Replication

2. Select **Replication** and select **Distributor Properties**.



3. Select **Profile Defaults**.
4. Select the **Log Reader Agents** page from the list.

Syniti Data Replication



Default agent profile (default for new agents) is selected. To make a copy of this profile and apply a custom setting:

Syniti Data Replication

5. Click **New** to open the **New Agent Profile** dialog.

Name:

Description:

Profile parameters

Parameter	Default Value	Value
-HistoryVerboseLevel	1	1
-LoginTimeout	15	15
-LogScanThreshold	500000	500000
-PollingInterval	5	5
-QueryTimeout	1800	1800
-ReadBatchSize	500	500

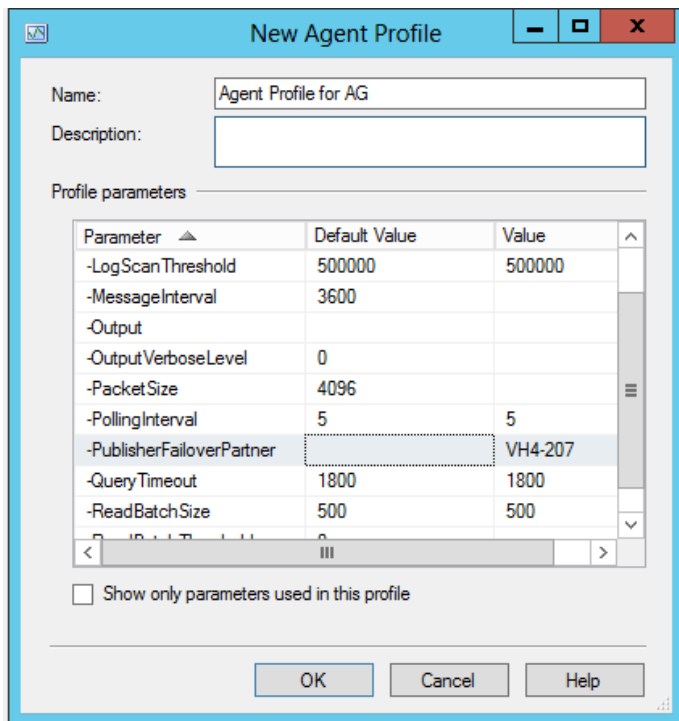
Show only parameters used in this profile

OK Cancel Help

6. Type a name for the new profile.
7. Uncheck **Show only parameters used in this profile**.
8. Scroll to the property called **PublisherFailoverPartner**.

Syniti Data Replication

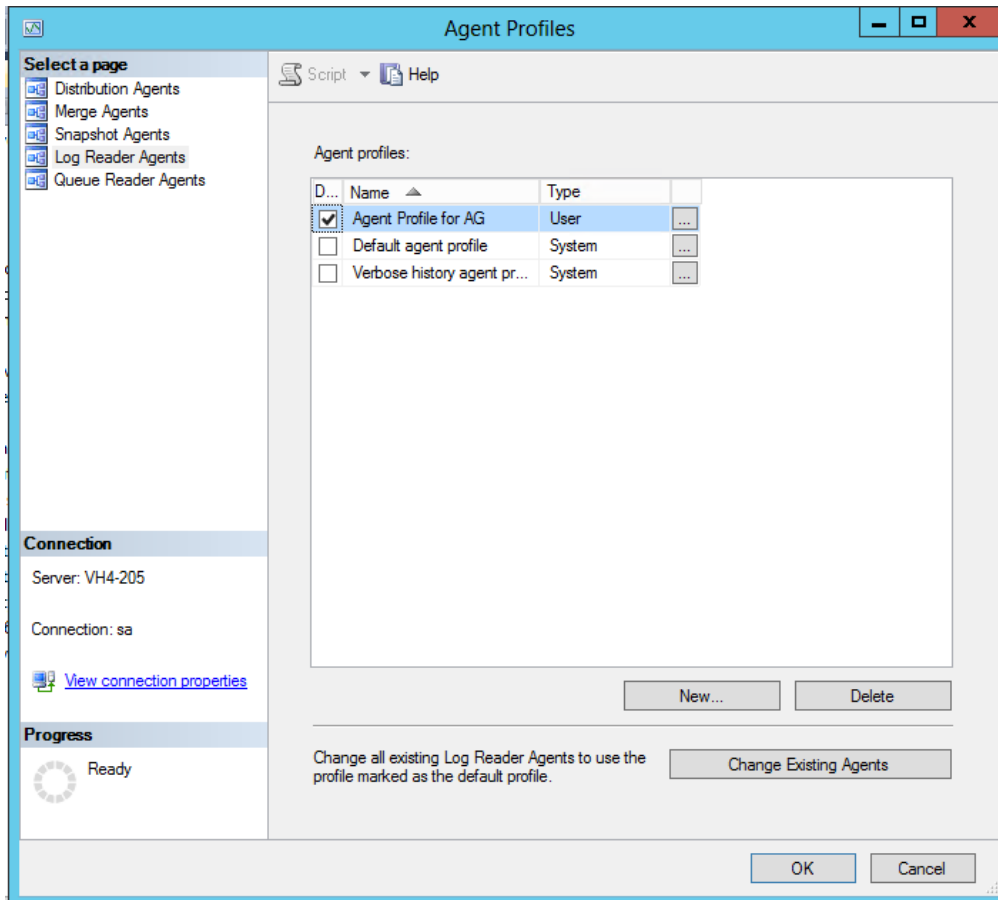
- Set the name of the secondary replica, VH4-207.



- Click **OK** to save the profile.

Syniti Data Replication

11. In the Agent Profile properties, select the new agent profile as default instead of the **Default agent profile**.



12. Click **OK**.

13. Click **OK** again to exit the Distributor Properties dialog.

NOTE: The steps above for setting the agent profile work for a single secondary replica. For multiple secondary replicas, it may be possible to define multiple agent profiles, each one using a different PublisherFailoverPartner value, and set it properly as default to each publisher. However, the details are beyond the scope of this document. Please contact Syniti Software support at support.syniti.com for additional information.

5. Add Linked Servers to Secondary Replicas

In the event that a secondary replica transitions to the primary role, it must be configured so that the secondary can take over after a failover.

All possible publishers will connect to the subscriber using a linked server.

Copyright© 2022 by BackOffice Associates, LLC d/b/a Syniti and/or affiliates. All Rights Reserved. This document contains confidential and proprietary information and reproduction is prohibited unless authorized by Syniti. Names appearing within the product manuals may be trademarks of their respective owners.

Syniti Data Replication

To create a linked server to the subscriber, VH4-205, open a connection to the secondary replicas and create the linked server to it:

1. Connect to the secondary replica VH4-207.
2. Run the query below:

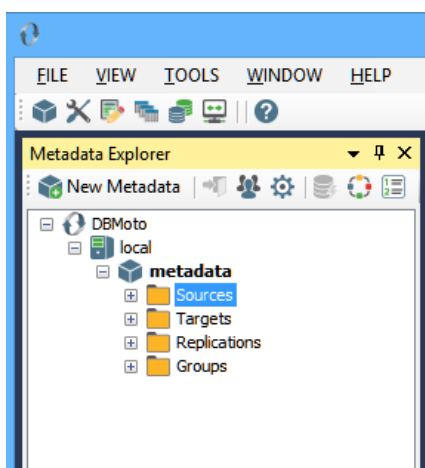
```
EXEC sys.sp_addlinkedserver @server = 'VH4-205'
```

6. Configure the SQL Server Connection in Syniti Data Replication

Configure the source connection in Syniti Data Replication that points to the SQL Server Availability Group (AG), so that the application can connect to the AG and switch dynamically among the cluster replicas.

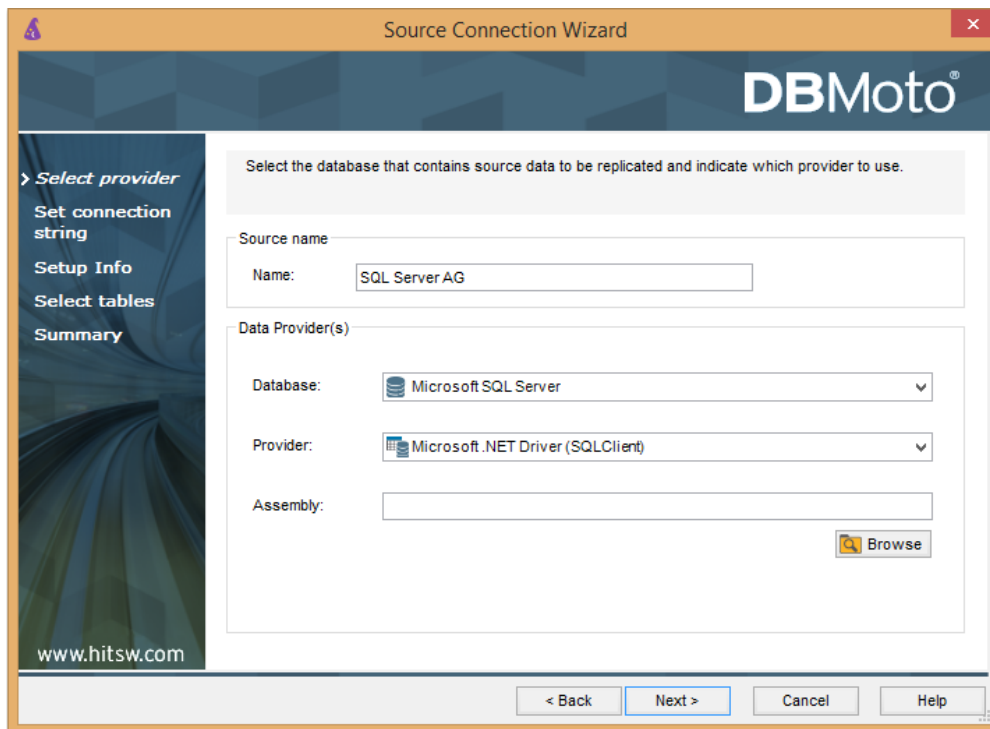
In the Management Center:

1. From the Metadata Explorer **Sources** list, right click and choose **Add New Connection**.



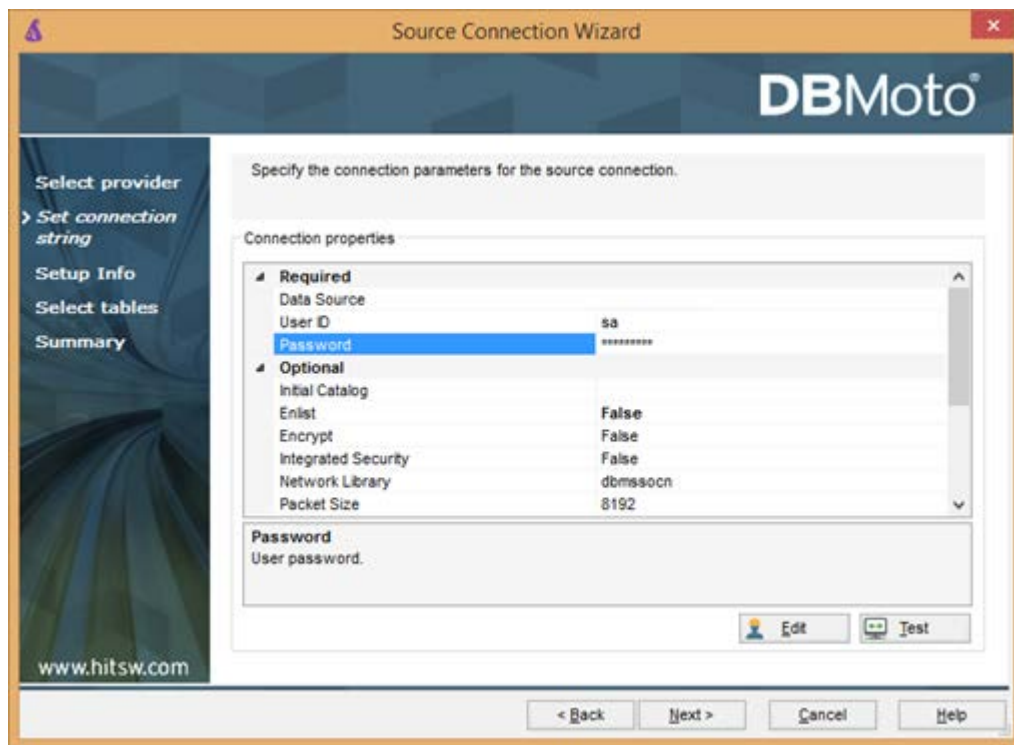
Syniti Data Replication

2. In the **Select Provider** screen, type a name and choose **Microsoft SQL Server** as the provider.



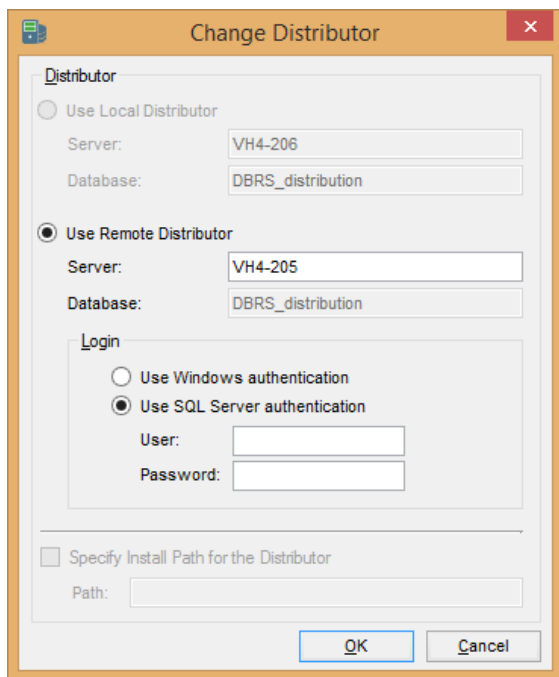
3. Specify connection parameters.

Syniti Data Replication



4. In the **Setup Info** screen, select **Log Reader**.
5. Set the IP address that you use to connect to SQL Server from Syniti Data Replication to the [Availability Group listener IP address](#). Using the listener IP allows Syniti Data Replication to automatically switch from one replica to another once a failover has occurred.
6. Specify the user name and password for the connection. Click **Verify** to check for an existing distributor.
D Syniti Data Replication determines a that remote distributor has been established but a login is required to be able to connect to it.
7. The Change Distributor dialog automatically shows the remote distributor name VH4-205, and asks you to specify a user name and password.

Syniti Data Replication



8. Type the user name and password.

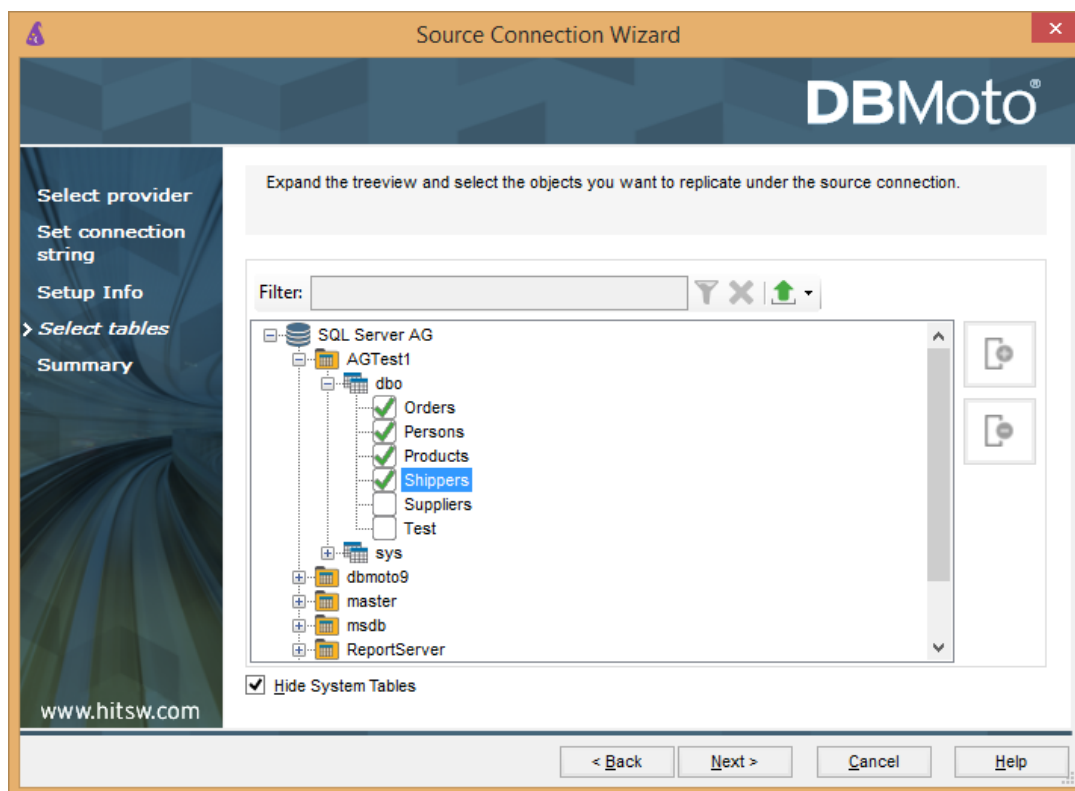
9. Click **OK**.

A message prompt shows that the distributor is correctly set up.

10. Click **Next**.

11. In the **Select Tables** screen, select a few test tables from the AG database (in this case, AGTest1.)

Syniti Data Replication



12. Click **Next**.

13. Click **Finish** to create the connection.

7. Add Replications and Create the Publication Database

Add a target connection and create replications in the usual way.

8. Redirect the Publisher to the AG Listener Name

1. In the SQL Server Management Studio, connect to the distributor VH4-205.
2. For **each replica** (VH4-206 and VH4-207), run the stored procedure `sp_redirect_publisher` to associate the original publisher and the published DB with the AG listener name:

```
USE DBRS_distribution;  
GO  
EXEC sys.sp_redirect_publisher  
    @original_publisher = 'VH4-206',  
    @publisher_db = 'AGTest1',  
    @redirected_publisher = 'TEST1_AG_Listen';
```

Syniti Data Replication

NOTE: Run this stored procedure again, substituting VH4-207 for VH4-206

3. In the distribution database, for **each replica** (VH4-206 and VH4-207), run the stored procedure `sp_validate_replica_hosts_as_publishers` to verify that the replica host is now configured to serve as publisher for the published database:

```
USE DBRS_distribution;
GO
DECLARE @redirected_publisher sysname;
EXEC sys.sp_validate_replica_hosts_as_publishers
    @original_publisher = 'VH4-206',
    @publisher_db = 'AGTest1',
    @redirected_publisher = 'TEST1_AG_Listen';
```

NOTE: Run this stored procedure again, substituting VH4-207 for VH4-206

NOTE: This procedure is necessary whenever a new database is added to a replication: the publisher database will have to be specified in the queries.

Test the Configuration

Let the replications start and run the initial refresh. Run some transactions from the active node (VH4-206) and verify that they are correctly replicated to the target.

Execute a manual failover to the secondary replica using the Failover wizard in SQL Server. Wait to see the secondary node become the primary replica. Run some transactions from the active node (VH4-207) and verify that they are correctly replicated to the target.

Notes

1. The SQL Server Reader Agent has to be running on the Distributor machine only.
2. When creating the distributor, this error can be generated:

```
Named Pipes Provider: Could not open a connection to SQL Server [53].
OLE DB provider "SQLNCLI11" for linked server "repl_distributor" returned
message "Login timeout expired".
OLE DB provider "SQLNCLI11" for linked server "repl_distributor" returned
message "A network-related or
instance-specific error has occurred while establishing a connection to
SQL Server. Server is not found or not accessible.
```

Syniti Data Replication

Check if instance name is correct and if SQL Server is configured to allow remote connections. For more information see SQL Server Books Online."

SOLUTION:

Check if the instance name is correct, by running 'select @@servername'. This name should match the server name you are using in the distributor wizards and in the SQL statements you have run so far, for instance 'VH4-207'. If this is not the case, you must to reconfigure the name of the local instance by running:

- sp_dropserver 'oldname' (the name found from the select @@servername)
- sp_addserver 'newname' (for instance, VH4-207)
- Restart the SQL Server services

3. When running the failover to the VH4-207, make sure the Log Server Agent is running and has no errors.

Check eventual errors here:

1. In the SQL Server Console, click **SQL Server Agent**.
2. Expand and double click **Job Activity Monitor**.
3. Check the job named to match the database (in the example above 'VH4-206-AGTest1-1').
4. In the SQL Server Console, click **Replication**.
5. Select **Launch Replication Monitor**.
6. Check if all publishers are functioning or show any error icon. In case of errors, expand to find the error items. For example, the following error could occur:

```
The process could not execute 'sp_replcmds' on VH4-207
```

```
Status: 0, code: 15517, text: 'Cannot execute as the database principal because the principal "dbo" does not exist, this type of principal cannot be impersonated, or you do not have permission.'
```

SOLUTION:

The error states that the current owner of the job is not a DBO on the Publication Database. Hence the next logical step is to make the job owner the DBO of the database as follows.

1. Connect to VH4-207
2. Change the owner of the database:

```
USE AGTest1;  
sp_changedbowner 'sa'
```