

Sitecore CMS 6.3 and Later

SQL Server Replication Guide

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Chapter 1

SQL Server Replication Guide

This document provides guidance for using SQL Server replication with Sitecore.

This information in this document is valid for Sitecore CMS 6.3 and later. SQL Server replication is supported on Sitecore 6.3 and later.

This chapter contains the following sections:

- SQL Server Replication Overview
- SQL Server Replication Configuration
- Troubleshooting SQL Server Replication

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1.1 SQL Server Replication Overview

You can use SQL Server replication to synchronize Sitecore databases in multiple locations. For example, you can use SQL Server replication to synchronize the Master database between multiple Content Management (CM) environments.

Important:
Synchronize the operating system time between Content Management and Content Delivery environments. The operating system time must be the same for all CM, CD and database instances on all Web Servers and Database Servers.

1.1.1 Distributor

A distributor is a database server responsible for synchronizing data using SQL Server replication, managing publications and subscriptions. SQL Server uses a distribution database to manage replication.

1.1.2 Publication

A publication is a database to synchronize using SQL Server replication. Select a database in one environment as the publication database. The corresponding database(s) in other environments will function as subscriptions.

1.1.3 Subscriptions

A subscription is a database to synchronize using SQL Server replication.

Because any environment can initiate data changes in a replicated database, the publication database functions as a subscription database.

You can use any of the techniques described in the following sections to create subscriber databases from the publication database.

Initialize Subscriptions with a Database Backup

To initialize a subscriber with a database backup:

1. Disable write access to the publication database.
2. Archive the publication database.
3. Restore the database to replicate to as one or more subscribers.
4. Configure SQL Server replication as described in this document.
5. Enable write access to the publication and subscriber databases.

Initialize Subscriptions with a Snapshot Using a Network Share

To initialize a subscriber with a snapshot, when you are configuring SQL Server replication as described in this document, do the following:

1. Make sure that the `EventQueue` table on the publication server is empty. To do this, execute the following SQL command: `delete from EventQueue`. Otherwise you may experience problems with the initialization timestamp columns in the subscriber tables.

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2. In the **New Publication Wizard**, in the **Snapshot Agent** window, select the **Create a snapshot immediately and keep the snapshot available to initialize subscriptions** check box.

For more information about the New Publication Wizard, see the section *Publication Configuration*.

Note
Because you only initialize a subscriber once, you do not need to schedule the snapshot agent.

Initialize Subscriptions with SQL Server Integration Services

You can initialize a subscriber by copying the publication database using SQL Server Integration Services.[1]

1.1.4 Replication Modes that Sitecore CMS Supports

Sitecore CMS supports Merge replication mode for Sitecore content databases.

Sitecore does not support Transactional and Snapshot replication modes due to technical limitations in conflict resolution, database schema requirements, and synchronization frequency associated with these modes. Sitecore has not tested Transactional and Snapshot replication modes and use of these modes may lead to unexpected behavior in regards to data and cache consistency.

Sitecore CMS does not support replication of the *Analytics* database in any way.

[1] For instructions to copy a database using SQL Server Integration Services, see http://msdn.microsoft.com/en-us/library/ms188664.aspx.

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1.2 SQL Server Replication Configuration

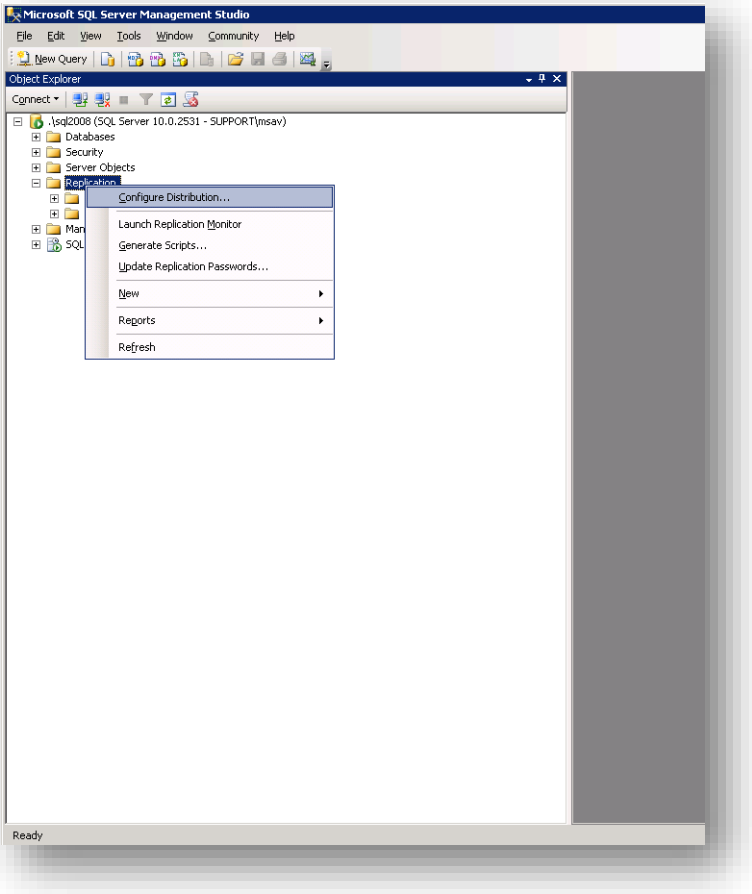
Consider the information in the following sections when configuring SQL Server replication.

To configure SQL Server to participate in SQL Server replication, you should ensure that the *SQL Server Agent Windows* service starts automatically.

1.2.1 Distributor Configuration

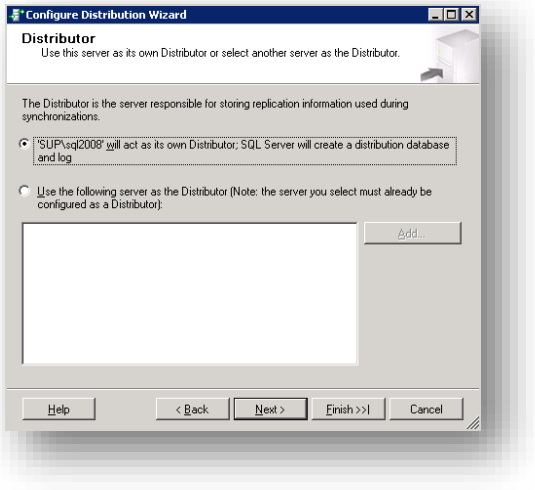
To configure the publisher as the distributor:

1. Ensure that the *SQL Server Agent Windows* service starts automatically.
2. In **SQL Server Management Studio**, expand the branch for the database, right-click *Replication*, and then click **Configure Distribution**.

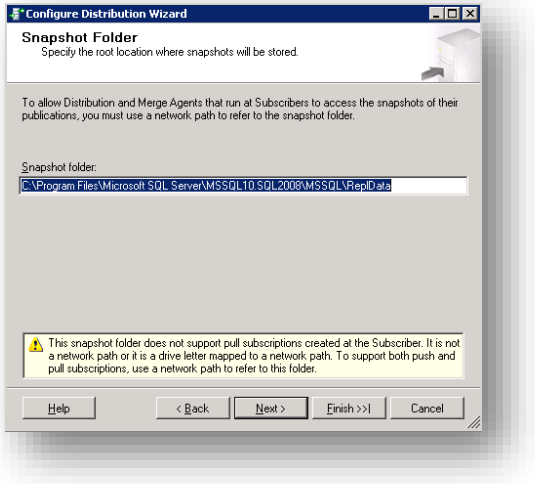


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3. The **Configure Distribution Wizard** appears. Click **Next**.



4. In the **Distributor** window, select the option that allows the database to act as its own distributor, and then click **Next**.

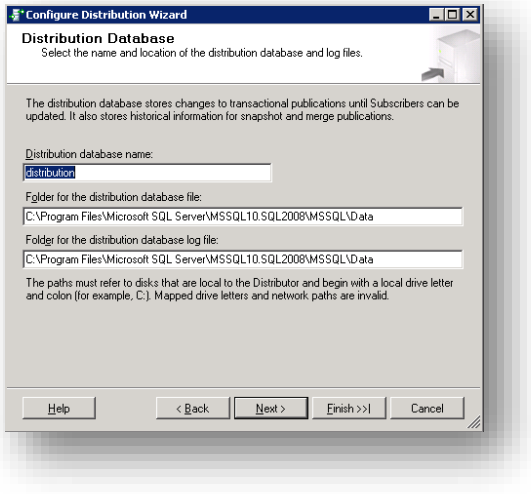


5. In the **Snapshot Folder** window, in the **Snapshot folder** field, enter the path to the folder where you want to store snapshots.

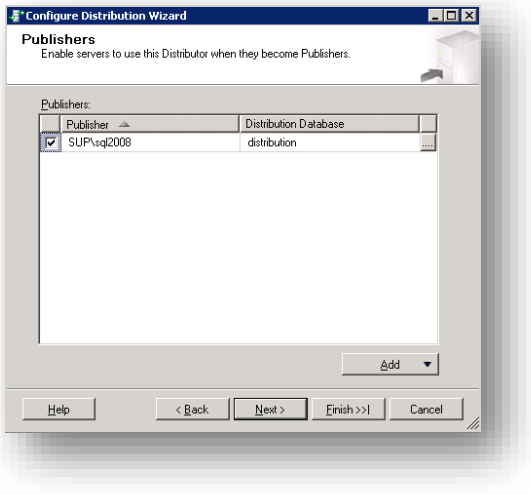
   To make snapshots easily available for initializing subscriptions, enter the path to a network share. For more information about initializing subscriptions, see the section *Subscriptions*.

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6. Click **Next**.

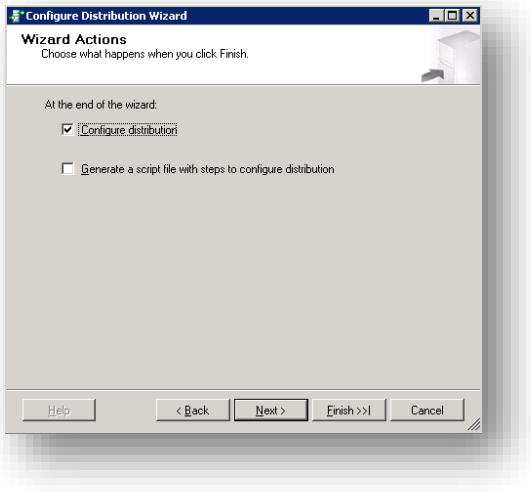


7. In the **Distribution Database** window, in the **Distribution database name** field, enter a name for the distribution database.
8. In the **Folder for the distribution database file** field and in the **Folder for the distribution database log file** field, enter appropriate values and then click **Next**.

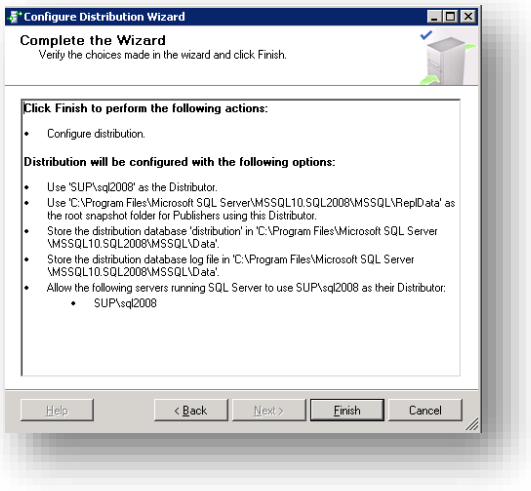


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9. In the **Publishers** window, select the database server, and then click **Next**.



10. In the **Wizard Actions** window, select the **Configure distribution** check box, and then click **Next**.



11. In the **Complete the Wizard** window, review the options that you selected and then click **Finish**.

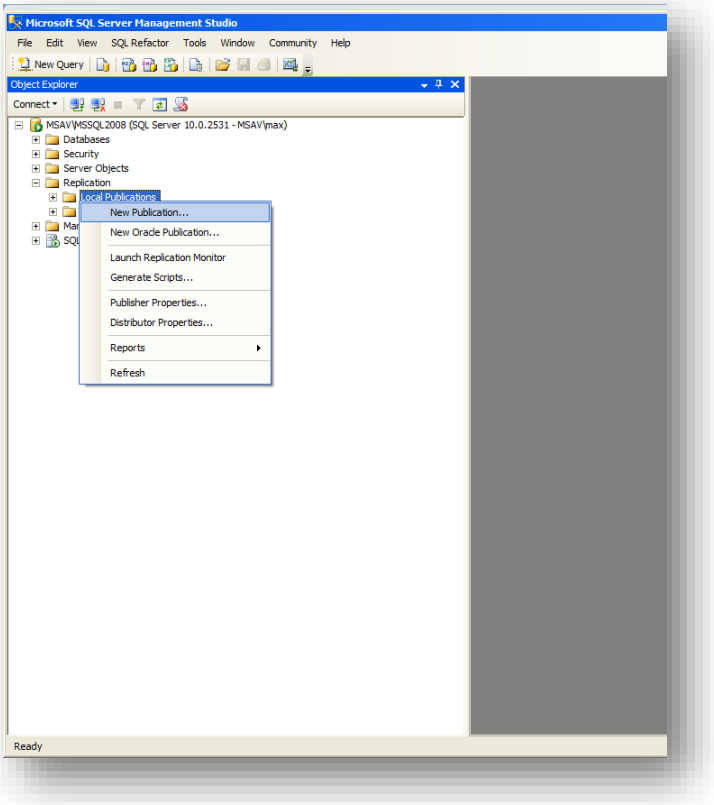
1.2.2 Publication Configuration

To create a new publication:

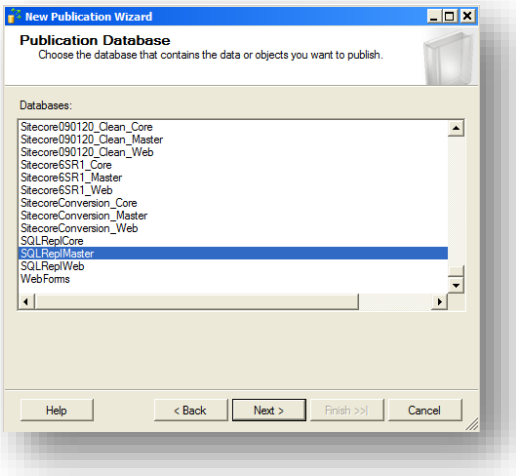
1. Ensure that the *SQL Server Agent Windows* service starts automatically.

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2. Open **SQL Server Management Studio**.

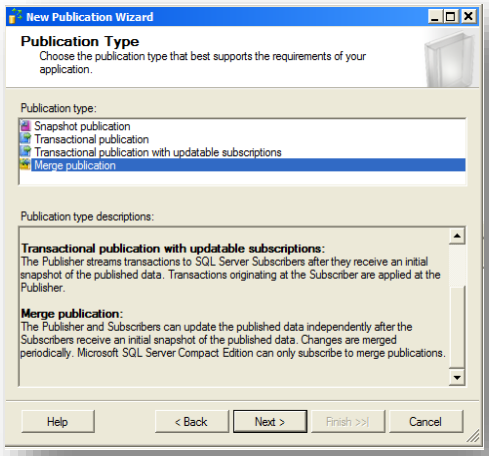


3. In **SQL Server Management Studio**, in the **Object Explorer**, expand the database, expand *Replication*, right-click *Local Publications*, and then click **New Publication**.
4. In the **New Publication Wizard** click **Next**.

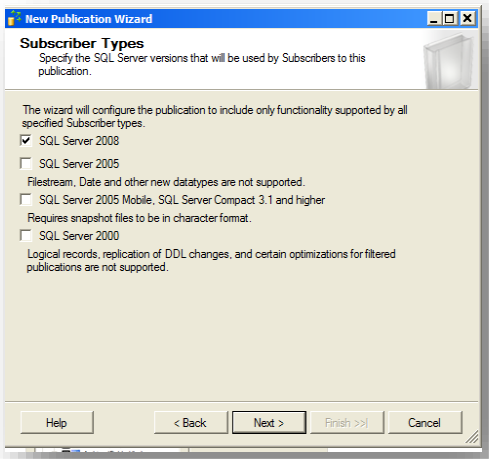


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5. In the **Publication Database** window, select the publication database, and then click **Next**.

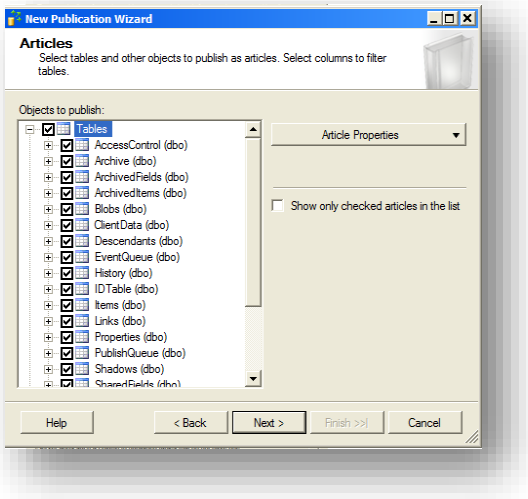


6. In the **Publication Type** window, in the **Publication Type** field, select *Merge publication*, and then click **Next**.

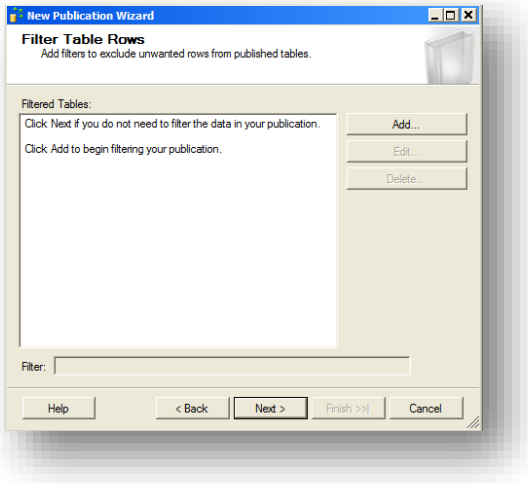


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7. In the **Subscriber Types** window, select the version of SQL Server that all your Sitecore instances are running on, and then click **Next**.



8. In the **Articles** window, select all of the tables, and then click **Next**.



You do not need to replicate views.

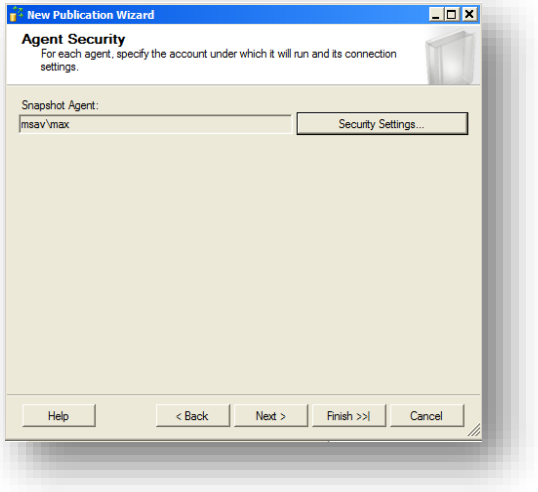
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9. In the **Filter Table Rows** window, click **Next**.



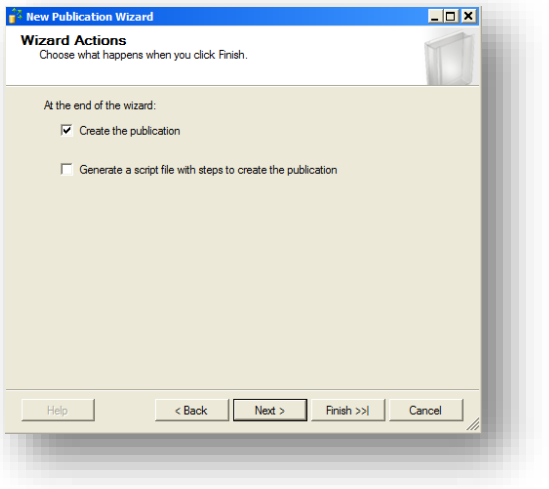
10. In the **Snapshot Agent** window, select the **Create a snapshot immediately and keep the snapshot available to initialize subscriptions** check box, and then click **Next**.

    For more information about initializing subscriptions from snapshots, see the section *Initialize Subscriptions with a Snapshot Using a Network Share*.

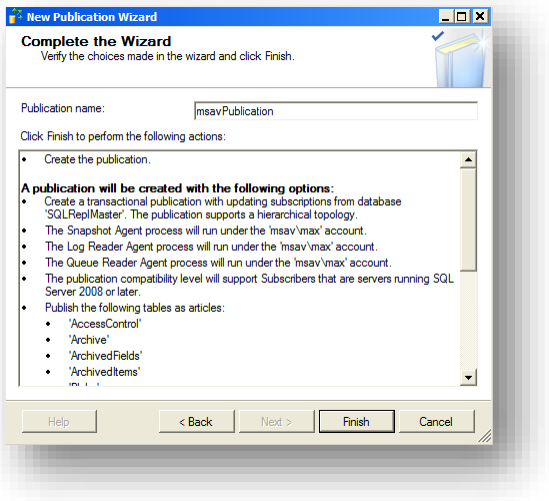


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11. In the **Agent Security** window, if you need to configure security, click **Security Settings**, and configure the security settings as required. Then click **Next**.



12. In the **Wizard Actions** window, select the **Create the publication** checkbox, and then click **Next**.



13. In the **Complete the Wizard** window, in the **Publication name** field, enter a name for the publication, and then click **Finish**.

Note
You can enter any allowed value for **Publication name**.

14. To ensure that replication works, you must configure the publication to replicate the *EventQueue* table after the other tables.

    To replicate the *EventQueue* table, execute the following SQL script on the Publication database:

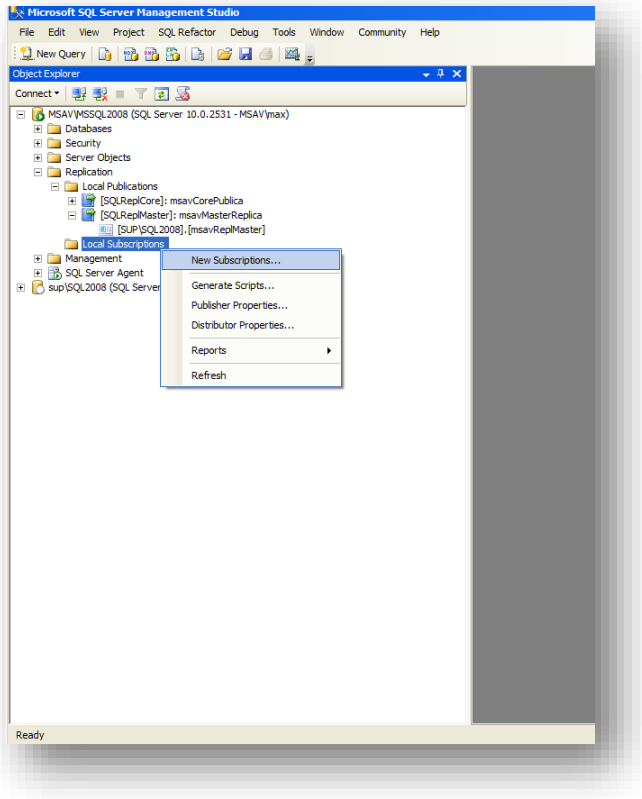
```
EXEC sp changemergearticle
          @publication = 'msavPublication',
          @article = 'EventQueue',
          @property='processing_order',
          @value=100;
GO
```

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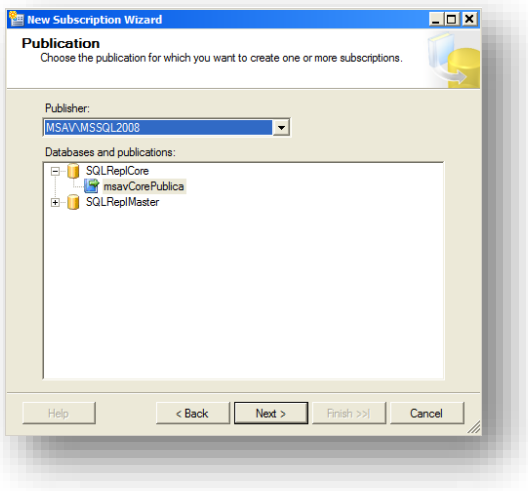
1.2.3 Subscription Configuration

To configure subscription:

1. Ensure that the *SQL Server Agent Windows* service starts automatically.
2. In **SQL Server Management Studio**, expand the database, expand *Replication*, right-click *Local Subscriptions*, and then click **New Subscriptions**.



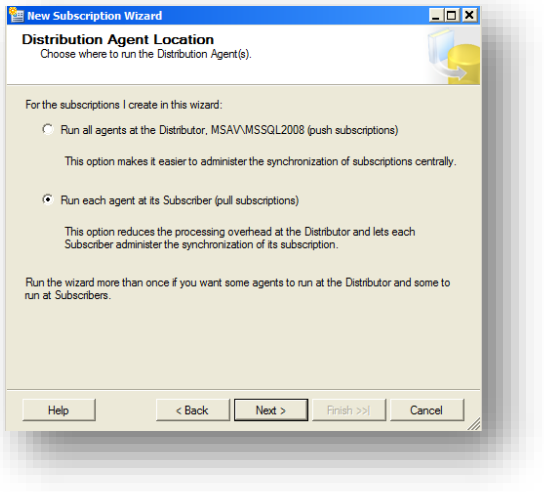
3. In the **New Subscription Wizard** that appears, click **Next**.



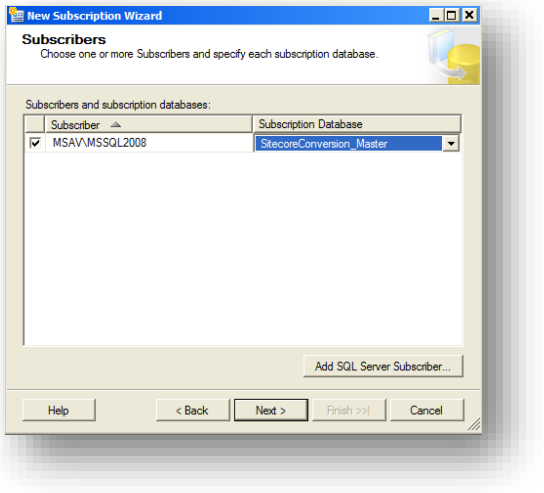
4. In the **Publication** window, in the **Publisher** field, select the publisher.

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5. In the **Database and publication** field, select the publication and then click **Next**.

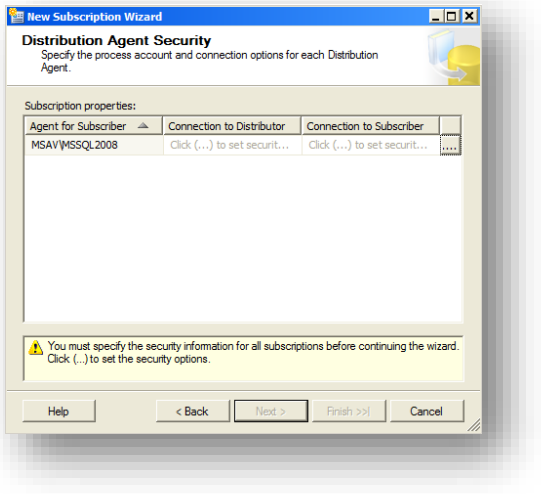


6. In the **Distribution Agent Location** window, select the **Run each agent as its Subscriber (pull subscriptions)** option to reduce the load on the distributor, and then click **Next**.

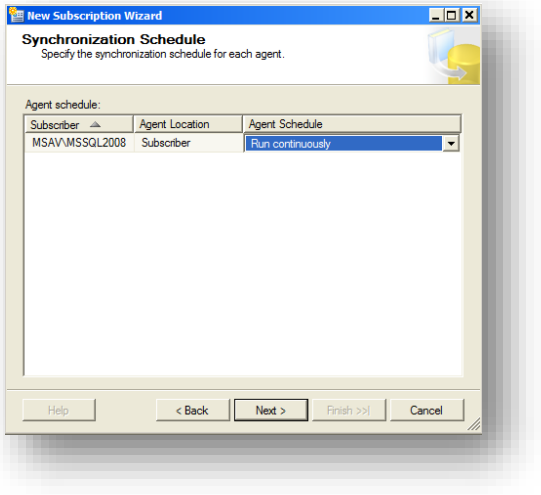


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7. In the **Subscribers** window, add subscribers and subscription databases.

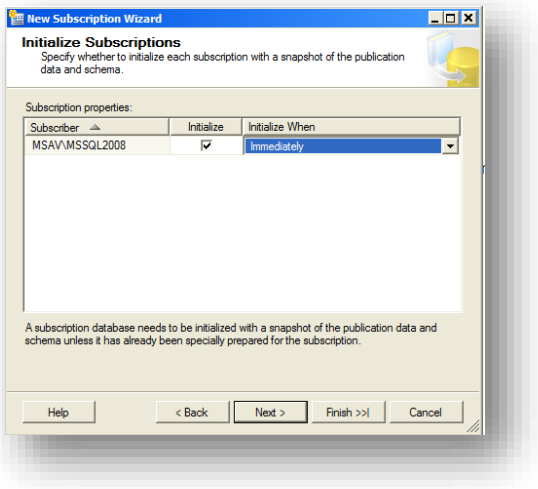


8. In the **Distribution Agent Security** window, select an appropriate account for each subscriber, and then click **Next**.

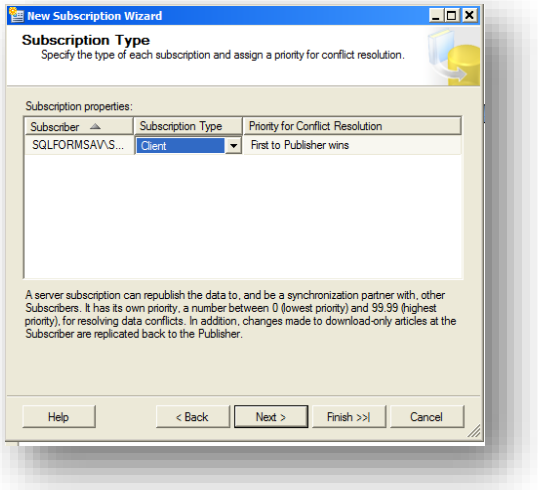


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9. In the **Synchronization Schedule** window, in the **Agent Schedule** field, select *Run continuously*, and then click **Next**.

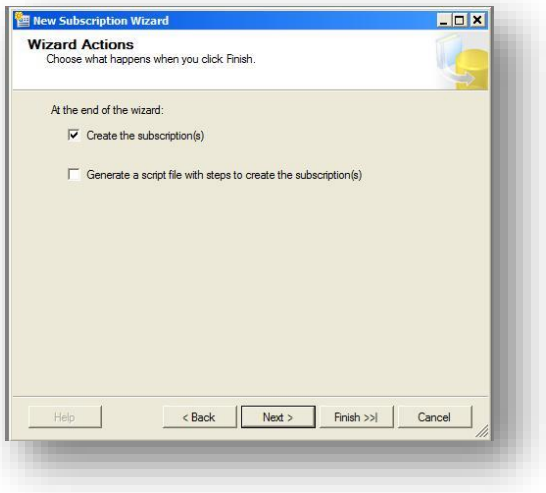


10. In the **Initialize Subscriptions** window, in the **Subscription properties** field in the **Initialize When** column, select *Immediately*, and then click **Next**.

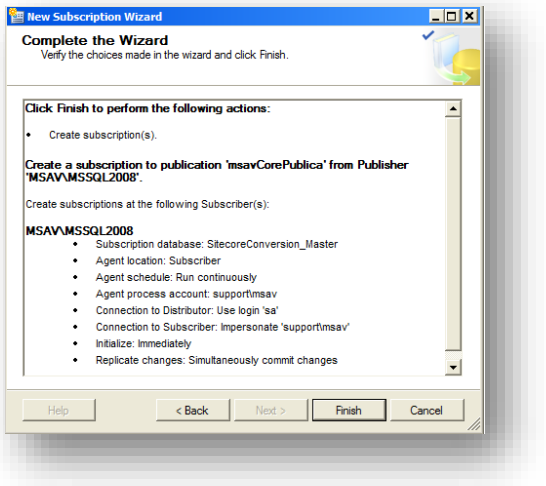


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11. In the **Subscription Type** window, in the **Subscription properties** field in the **Subscription Type** column, select *Client*, and then click **Next**.



12. In the **Wizard Actions** window, select the **Create the subscription(s)** check box, and then click **Next**.



13. In the **Complete the Wizard** window, review the option you selected, and then click **Finish**.

1.2.4 Polling Interval

By default, SQL Server merges replication polls for data to synchronize at an interval of 60 seconds. This value may be incorrect for certain environments.

Warning
Reducing the polling interval can increase server load.

To configure the polling interval:

1. In **SQL Server Management Studio**, expand **SQL Server Agent**, then expand the **Jobs** folder, right-click the merge agent job, and then select **Properties**. The **Job Properties** dialog box appears.

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2. In the **Job Properties** dialog box, click the **Steps** tab, select the **Run Agent** step, and then click **Edit**. The **Job Step Properties** dialog box appears.
3. In the **Job Step Properties** dialog box, in the **Command** field, add `-PollingInterval <seconds>`, where `<seconds>` is the number of seconds between polls.

   For example, enter `-PollingInterval 1` to poll for data changes every second.

1.2.5 Replication Agent Profiles

To improve performance, you can configure the high-volume server-to-server replication SQL Server Replication Agent Profiles for the merge replication agent.[2]

[2] For more information about SQL Server Replication Agent Profiles, see http://technet.microsoft.com/en-us/library/ms151223.aspx.

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1.3 Troubleshooting SQL Server Replication

This section contains instructions for troubleshooting issues with SQL Server replication.

1.3.1 Cannot Execute sp_replcmd

The log reader agent can fail to start with an error such as the following:

Cannot execute sp_replcmd

In this case, execute the following query on the publisher for the problematic database:

```
exec sp_changedbowner 'sa'
```

1.3.2 The Identity Range Managed by Replication Is Full

SQL Server can raise an exception such as the following:

The identity range managed by replication is full and must be updated

In this case, to prevent collisions when automatically incrementing identifiers, you should configure the publications and subscribers to use different ranges for the identity columns.

The columns that may cause this exception are WorkflowHistory and PublishQueue. For Sitecore versions 6.3.0 and 6.4.0, the EventQueue column may also cause this exception. For Sitecore versions 6.3.1, 6.4.1 and later EventQueue cannot cause this exception.

To configure identity ranges:

1. In **Microsoft SQL Server Management Studio**, expand **Replication**, expand **Local Publications**, then right-click the publication, and then click **Properties**. The **Publication Properties** dialog box appears.
2. In the **Publication Properties** dialog box, click **Articles**.
3. In the **Publication Properties** dialog box, right-click the problematic table, and then click **Set Properties of This Table Article**. The **Article Properties** dialog box appears.
4. In the **Article Properties** dialog box, under **Identity Range Management**, enter alternate values for **Publisher range size** and **Subscriber range size**.

1.3.3 The Merge Process Was Unable to Deliver the Snapshot to the Subscriber

You can get the following SQL error when replication for a database is set if the `EventQueue` table is not empty:

```
The merge process was unable to deliver the snapshot to the Subscriber. If
using Web synchronization, the merge process may have been unable to create
or write to the message file. When troubleshooting, restart the
synchronization with verbose history logging and specify an output file to
which to write.
The process could not bulk copy into table '"dbo"."EventQueue"'.
Could not bulk load. The sorted column 'Stamp' is not valid. The ORDER hint
is ignored.
```

The reason is that the SQL server cannot initialize a subscriber database from the snapshot, which contains values in a column of the "Timestamp" type (the `EventQueue` table has such a column).

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In this case, do the following (assuming that you set replication to DB1 and DB2, publication is set to DB1, and subscription is set to DB2):

1. Remove the subscription for the DB2 database (under the Local Subscriptions node in the SQL Management studio).
2. Remove the publication of the DB1 database (under the Local Publications node in SQL Management studio).
3. Erase all the rows in the `EventQueue` table of the DB1 database (perform the `TRUNCATE TABLE EventQueue` SQL command).
4. Disable write access to the DB1 database or make sure in another way that it is not modified and no rows are added to the `EventQueue` table until you finish setting a new publication.
5. Create a publication of the DB1 database (so that the snapshot is created while the `EventQueue` table is empty).
6. Create an empty database (for example NewDB2) to use it as a subscription database instead of the DB2 one (the DB2 database is no longer needed).
7. Set a subscription for the NewDB2 database (so that the NewDB2 database is initialized from the snapshot).

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