

Sitecore CMS 6.3 - 7.2 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

1.1.1 The Addition of a uniqueidentifier Column

SQL Server uses a globally unique identifier (GUID) column to identify each row in the table being replicated during the merge replication process. When configuring merge replication, you are prompted to add a **uniqueidentifier** column to tables that do not have it. Agree when prompted to proceed with the merge replication process.

• Troubleshooting SQL Server Replication



1.2 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.

1.2.1 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.

1.2.2 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.

1.2.3 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.
- 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

1.2.4 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 <u>http://msdn.microsoft.com/en-us/library/ms188664.aspx</u>.

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1.3 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.

1.3.1 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**.

Microsoft SQL : e Edit View	ierver Management Studio Tools Window Community Help		
New Query			
ect Explorer		+ # ×	
nect 🕶 🛛 🛃 💂	1 = 🝸 🖬 🍒		
sql2008 (S	QL Server 10.0.2531 - SUPPORT(msav)		
 Databas E is Security 	es		
🛨 🧰 Server (bjects		
•	Configure Distribution		
🕀 🧰	Launch Replication Monitor		
E 🚯 SQL	Generate Scripts		
	Update Replication Passwords		
	New >		
	Reports +		
	Refresh		
ady			



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**.

Configure Distribut	ion Wizard	
Snapshot Folde Specify the root loc	r ation where snapshots will be stored.	-
To allow Distribution an publications, you must u	d Merge Agents that run at Subscribers to access se a network path to refer to the snapshot folder.	the snapshots of their
Snapshot folder:		
C:\Program Files\Micro:	soft SQL Server\MSSQL10.SQL2008\MSSQL\R	epIData
This snapshot fold a network path or pull subscriptions,	ler does not support pull subscriptions created at it is a drive letter mapped to a network path. To s use a network path to refer to this folder.	the Subscriber. It is not upport both push and
This snapshot fold a network path or pull subscriptions, Help	fer does not support pull subscriptions created at it is a drive letter mapped to a network path. To s use a network path to refer to this folder. < <u>Rack</u> <u>Next ></u> <u>Einish</u>	the Subscriber. It is not upport both push and >>1 Cancel

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*.



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.

Publishers:			
Publisher 🔺	Distribution Da	tabase	
SUP\sql2008	distribution		

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

暮 Configure Distribution Wizard	
Wizard Actions Choose what happens when you click Finish.	
At the end of the wizard:	
Configure distribution	
Generate a script file with steps to configure distribution	
Help < <u>Back</u> <u>Next</u>	Cancel



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

Click Finish to perform the following actions: Cinfigure distribution. Distribution will be configured with the following options: Use SUP/sql2008 as the Distributor. Use SUP/sql2008 as the Distributor. Use SUP/sql2008 as the Distributor. Store the distribution database (satisfue) in 'C.YProgram Files/Microsoft SQL Server WSSQL10.SQL2008/MSSQL/Data'. Store the distribution database log life in 'C.YProgram Files/Microsoft SQL Server WSSQL10.SQL2008/MSSQL/Data'. Allow the following servers running SQL Server to use SUP/sql2008 as their Distributor: SUP/sql2008						
Computer simulation C	Cantinua Cantinua	to perform	the following a	ictions:		
Distribution will be configured with the following options: Use SUPIsq2008 as the Distributor. Use SUPIsq2008 as the Distributor. Use SUPIsq2008 as the Distributor. Store the distribution database distribution in "C-VPogram Files/Microsoft SQL Server WSSQL10.SQL2008/MSSQLVData". Store the distribution database log file in "C-VPogram Files/Microsoft SQL Server WSSQL10.SQL2008/MSSQLVData". Allow the following servers running SQL Server to use SUP/sql2008 as their Distributor: • SUP-sql2008	• Conrigur	e distribution.				
Use SUPIsad2008 as the Distributor. Use SUPIsad2008 as the Distributor. Use SUPIsad2008 as the Distributor. Sloce the distribution distabase distribution in TCNProgram Files/Microsoft SQL Server MrSSQL1054(2008/MSQL Data). Store the distribution database tog file in TCNProgram Files/Microsoft SQL Server MrSSQL1054(2008/MSQL Data). Allow the following servers running SQL Server to use SUPIsad2008 as their Distributor. SUPIsad2008 Use SUPIsad2008	Distribution	will be con	figured with th	e following	options:	
	▶ Use'C:\	-'rogram Files'	Microsoft SQL Se	erver\MSSQL	10.SQL2008\MSSI	UL\HepIData'as

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

1.3.2 Publication Configuration

To create a new publication:

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

Choose the databas	e that contains the data or obje	cts you want to publish.	
Databases:			
Stecore090120_Clean_ Stecore090120_Clean_ Stecore090120_Clean_ Stecore6SR1_Core Stecore6SR1_Water Stecore6SR1_Water StecoreConversion_Ma StecoreConversion_We SQLReplKore SQLReplKaster	Core Master Web ster b		
SQLRepIWeb WebForms			•
			a 1 1

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

Choose the plant application.	blication type t	nat best supp	ports the require	ments of your	
Publication type:					
 Snapshot publi Transactional p Transactional p Merge publicat 	ation ublication ublication with u	updatable su	bscriptions		
Publication type d	escriptions:				
Transactional p The Publisher stre snapshot of the pu Publisher.	ublication wi ams transaction blished data. Ti	th updatat s to SQL Se ransactions	le subscription over Subscribers priginating at the	ons: after they receive Subscriber are ap	an initial poplied at the
Transactional p The Publisher stre snapshot of the pi Publisher. Merge publicat The Publisher and Subscribers receiv periodically. Micro	ublication wi ams transaction blished data. Tr on: Subscribers ca e an initial snap roft SQL Server	th updatat s to SQL Se ransactions of n update the shot of the p Compact Ec	It subscription rver Subscribers originating at the published data (published data (dition can only sub-	ns: after they receive Subscriber are a independently aft Changes are merg ubscribe to merge	an initial pplied at the er the ed publications.

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

🚰 New Publication W	izard			
Subscriber Typ Specify the SQL So publication.	erver versions that will I	be used by Subs	cribers to this	
The wizard will configu specified Subscriber ty	re the publication to in pes.	clude only function	onality supported by a	al I
SQL Server 2008				
Filestream, Date and	other new datatypes ar	e not supported.		
Requires snapshot file	Aobile, SQL Server Cor as to be in character fo	mpact 3.1 and hij mat.	gher	
SQL Server 2000				
Logical records, replic publications are not s	ation of DDL changes upported.	, and certain opti	imizations for filtered	
Help	< Back	Next >	Finish >>	Cancel



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

hiecte to publich:		
	l (dbo)	Article Properties
Achivedheid Archivedheid Archivedheid Archivedheid Archivedheid Bobs (dbo) OrentData (db Descendante	o) (dbo)	Show only checked articles in the list
EventQueue (EventQueue (EventQueue (EventQueue (EventQueue (EventQueue (Double (dbo) EventQueue (Double (dbo)	(dbo)	
	o) (dbo)	
Shadows (dbc Horizon Graden Shared Fields	o) (dbo)	

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

itered Tables: Tick Next if you do not need to filter the data in	vour publication	Add	1
lick Add to begin filtering your publication.	ryour publication.	Edit	
		Delete	
ter:			

You do not need to replicate views.

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

New Publication Wizard	
Snapshot Agent Specify when to run the Snapshot Agent.	
Subscriptions are initialized with a snapshot of publication sc Agent creates the snapshot.	hema and data. The Snapshot
Create a snapshot immediately and keep the snapshot and shapshot and shapshot and shapshot are snapshot and shapshot are snapshot and shapshot are snapshot ar	vailable to initialize subscriptions
Schedule the Snapshot Agent to run at the following time	25:
	Change
f you plan to change the spanshot properties, do not start th	e Spapshot Agent until after you
f you plan to change the snapshot properties, do not start th hange the properties in the publication property dialog box.	e Snapshot Agent until after you
you plan to change the snapshot properties, do not start th hange the properties in the publication property dialog box.	e Snapshot Agent until after you
f you plan to change the snapshot properties, do not start th change the properties in the publication property dialog box. Help < Back Next >	e Snapshot Agent until after you



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*.

settings.			
napshot Agent: Isav\max		Security Settin	ıgs

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**.

Publication Wizard			_ 🗆 🗡
rd Actions pose what happens when you click	k Finish.		
the end of the wizard:			
Create the publication			
Generate a script file with ste	ps to create the pub	lication	
elp < Back	Next >	Finish >>	Cancel
elp Sack	Next >	Finish >>	Cancel



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:



1.3.3 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.

lew Subscription Wizard	_ 🗆 🗙
ublication Choose the publication for which you want to create one or more subscriptions.	
Publisher:	
MSAV-MSSQL2008	
Gold RepCore SQLRepIMaster	
Help < Back Next > Finish >>/	Cancel

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



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**.

	and se one of more Sub	scribers and spe	icity e		iption database		S
bub	Subscriber 🔺	n databases:		Subscript	ion Database		
•	MSAV\MSSQL2008		SitecoreConversion_Master		•		
					Add SQL Ser	ver Subscr	iber
					Add SQL Ser	ver Subscr	tiber

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

ubscription properties:	[[_
Agent for Subscriber A	Connection to Distributor	Connection to Subscriber	
You must specify the se Click () to set the sec	scurity information for all subscri inty options.	ptions before continuing the wize	ard.



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

Specify the synchro	Schedule	ach agent.	
gent schedule:			
Subscriber 🔺	Agent Location	Agent Schedule	
MSAV\MSSQL2008	Subscriber	Run continuously	-
Help	< Back	Next > Finish >>/ Cancel	

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

Subscription properties:			
Subscriber 🔺	Initialize	Initialize When	
MSAV\MSSQL2008	~	Immediately	•
subscription database need chema unless it has already b	to be initialized een specially pr	with a anapahot of the publicat spared for the subscription.	ion data and

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

🔠 New Subscription W	/izard		
Subscription Ty Specify the type of e	pe each subscription and as	ssign a priority for conflict resolution.	
Subscription properties:			
Subscriber 🔺	Subscription Type	Priority for Conflict Resolution	
SQLFORMSAV\S	Client 💌	First to Publisher wins	
A server subscription c: Subscribers. It has its o priority), for resolving da Subscriber are replicate	in republish the data to, wn priority, a number be ta conflicts. In addition, d back to the Publisher	and be a synchronization partner with, tween 0 (lowest priority) and 999 (hig changes made to download-only article	other hest es at the
Help	< Back	Next > Finish >> C	ancel



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

New Sul	scription Wizard	_ D X
Nizard Choos	Actions e what happens when you click Finish.	
At the	end of the wizard:	
	Create the subscription(s)	
Г	Generate a script file with steps to create the subscription(s	s)
	1	1
Help	< Back Next > Finisl	h >> Cancel

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**.

1.3.4 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.
- 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.

1.3.5 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

1.3.6 The Addition of a uniqueidentifier Column

SQL Server uses a globally unique identifier (GUID) column to identify each row in the table being replicated during the merge replication process. When configuring merge replication, you are prompted to add a **uniqueidentifier** column to tables that do not have it. Agree when prompted to proceed with the merge replication process.

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

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1.4 Troubleshooting SQL Server Replication

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

1.4.1 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'
```

1.4.2 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.

1.4.3 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).

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).