LiteSpeed® for SQL Server® 9.1

Configure Log Shipping Guide

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Legend

CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

IMPORTANT, NOTE, TIP, MOBILE, or VIDEO: An information icon indicates supporting information.

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Updated - May 2026
Version - 9.1

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1

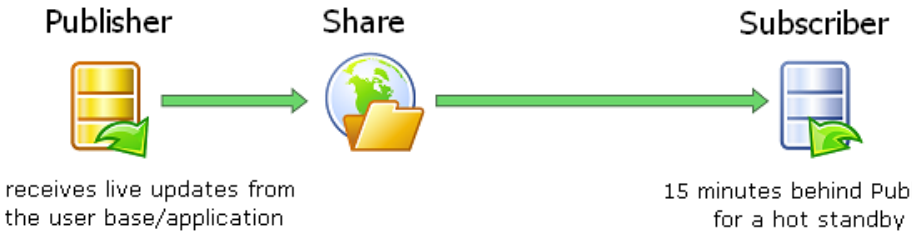
LiteSpeed Log Shipping

Log shipping is a critical feature for disaster recovery. It allows you to automate backing up a database (the publisher) and restoring its transaction logs on one or more standby databases (the subscribers). The process runs automatically throughout the day at the interval you specify, which creates synchronized databases.

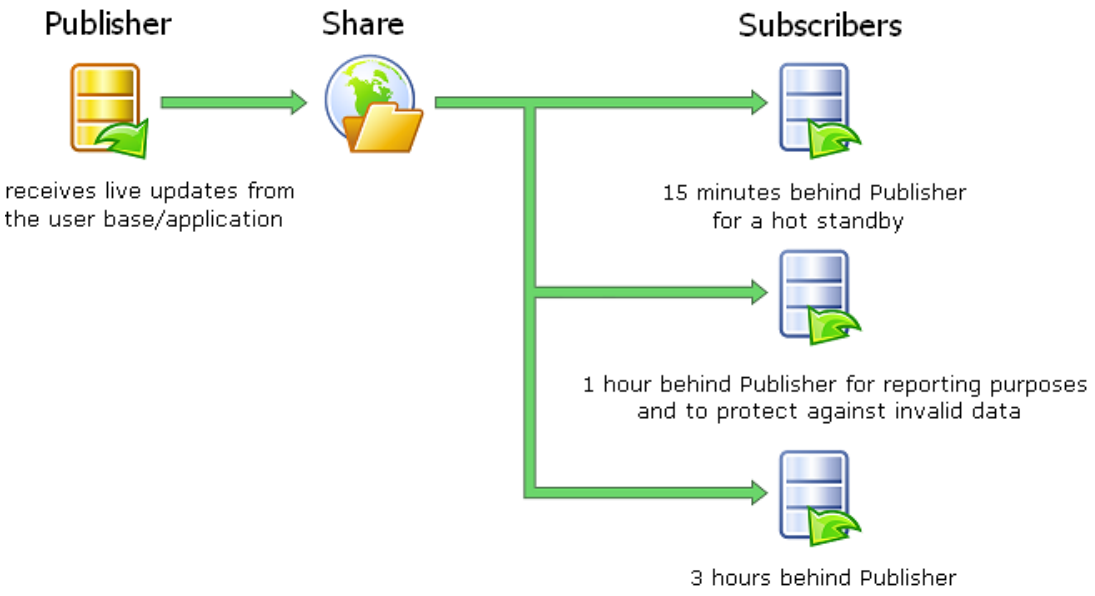
LiteSpeed for SQL Server provides flexible backup options for log shipping and allows you to create and modify LiteSpeed log shipping plans, monitor shipping progress and troubleshoot plan problems.

About Log Shipping Plans

In case you want to have a copy of your database on another server, you can configure a plan that contains only a publisher and one subscriber.



If you require more than one destination database, you can have multiple subscribers. This allows you to distribute your data at different rolling points in time for reporting and to cushion the impact of invalid data entry into the main system.



Log Shipping Jobs

The Backup job is created on publisher server. The Copy and Restore jobs are created on subscriber server(s).

Shared Folder

In all cases, the publishing server will backup to the specified shared folder where the subscriber server will copy backups from. Any server involved in the log shipping process can act as a file server. You can also specify the local path on the publisher server.

Destination Folder

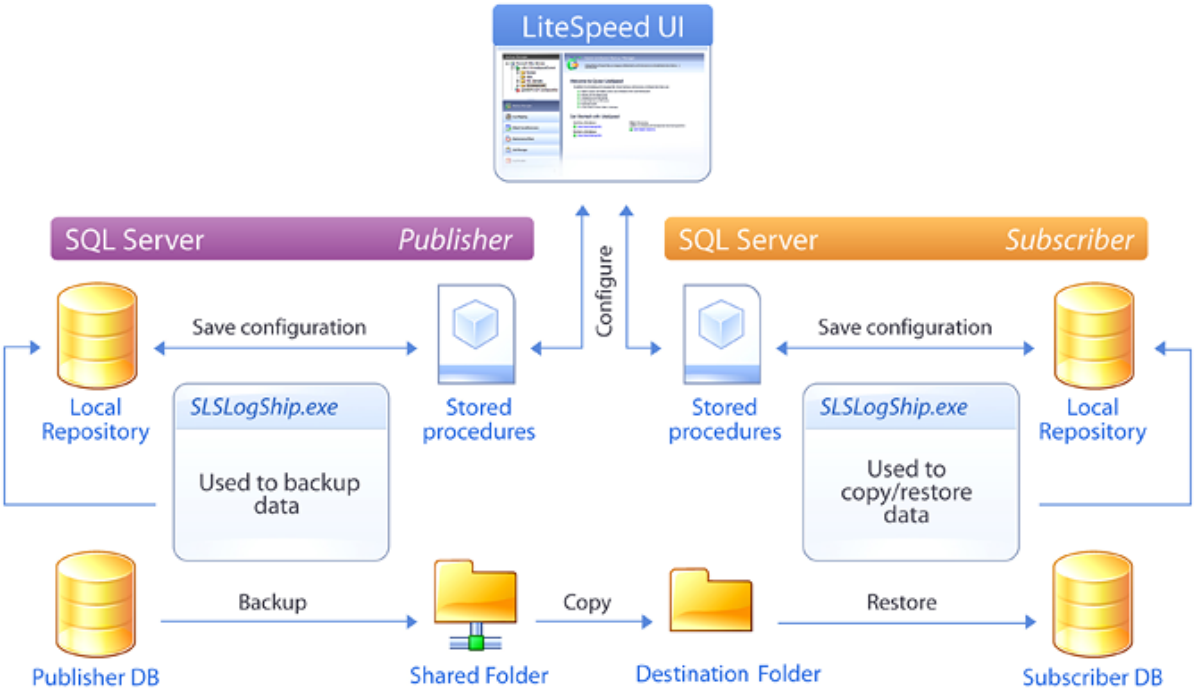
The subscriber server copies the transaction log backups from the shared folder to the specified destination folder and then restores them. It is recommended that you select a local destination folder on the Subscriber. The destination folder is also used for undo files to track incomplete transactions.

Initializing Log Shipping

A log shipping plan will not work unless it is initialized by restoring a full backup of publisher database to the subscriber database. The backup is written to and restored from the shared folder.

LiteSpeed Log Shipping Architecture

The diagram below shows the relationship between the LiteSpeed and SQL Server components involved in log shipping.



Log Shipping Requirements

NOTE: This section only focuses on requirements specific to log shipping and implies you have reviewed the general LiteSpeed requirements. For more information, please refer to the "Privileges and Grant Requirements" section of the LiteSpeed *Installation Guide*.

General

- LiteSpeed for SQL Server installed on all SQL Server instances involved in log shipping.
- Microsoft SQL Server version 2005/2008/2012/2014/2016/2017/2019/2022.
- Publisher and subscriber must have the same SQL Server version.
- Publisher and subscriber must have the same LiteSpeed version.
- SQL Server Agent must be running for all SQL server instances involved in log shipping.

NOTE: Backup log shipping is not supported in the Express edition of SQL Server.

Database

- All databases involved in log shipping must use a full or bulk-logged recovery model.
- A database can only have one log shipping publication (LiteSpeed or native).
- A local repository must exist on both the publisher and subscriber.

Permissions

- (On publisher) SQL Server Agent Service Account must have access and read/write permissions to the shared directory to write transaction log backups to. The same permissions are required for SQL Server Service Account used to initialize and reinitialize log shipping. You only need write permissions if you do not specify a local folder for the publisher.
- (On subscriber) SQL Server Agent Service Account must have access and read permissions to the shared directory to copy transaction log backups from. The same permissions are required for SQL Server Service Account used to initialize and reinitialize log shipping.

NOTE: You need to register all SQL Server instances involved in log shipping in the LiteSpeed UI Console to retrieve log shipping data for them. Please refer to the "Register Server Instances" section of the LiteSpeed *Installation Guide* for more information.

Create Log Shipping Plans

The Create LiteSpeed Log Shipping Plan wizard helps you set up a publisher database and one or more subscriber databases.

Scenario
Your company has a web site that customers use to query financial information. It is required that customers do not query the database that receives live updates by applications. You need to create a copy of that database on another server for customers to query it online.

NOTES:

- You should review log shipping requirements before creating a plan. For more information, see Log Shipping Requirements on page 7.
- Performing an individual transaction log backup on the publisher will break the log shipping plan.

To create a log shipping plan

1. Select the Log Shipping pane (CTRL+2).
2. Right-click the server instance and select **Create New Log Shipping Plan Wizard**.

Scenario: Select the database you want to copy to another server.

3. Review the following additional information about the Backup Options page:

UNC path to share folder where backup files are available for subscribers	Enter the network path or click to navigate to it. You should always complete this field. **Note:** UNC paths have the following format: \\<computer_name>\<shared_folder_name>.
Specify local path	Specify the local path if your SQL Server Service Agent is running on a local system account. If you enter a local path, the local stored procedures and jobs on publisher will use it instead of the UNC path. Otherwise, this field is not required.
Specify mirror path	Specify the mirror path where backup file will be copied from the original location. If a backup operation fails to the original location, a new backup operation will be started for creating the backup to the mirror path.
Perform full backup and then restore to initialize subscriber(s)	Select this option to create a full backup and restore it on the subscribers when creating the plan. If you do not select this checkbox, you must perform a full backup of the publisher and restore it on the subscribers before finishing the wizard. **Note:** Log shipping will not work unless you perform a *full* backup when setting up the plan.
Disconnect users when restoring full backup	Select this option to disconnect users when restoring full backup on the subscribers when creating the plan. **Note:**If **Perform full backup and then restore to initialize subscriber(s)** is unchecked, **Disconnect users when restoring full backup** will also be disabled and unchecked.
Backup interval (min)	The execution frequency of the backup job. By default, this job runs every *15* minutes. **Scenario:** For all time intervals, use the default values. Scheduling the backup, copy and restore jobs with the same frequency keeps the subscriber as close to the publisher as possible.
Retain backup files for (hrs)	The amount of time to store transaction log files. The default is *1440* (24 hours).
Alert threshold (min)	If no transaction log backups have occurred during this amount of time, LiteSpeed displays an alert on the monitoring tab. See View Log Shipping Activity and History for more information. The default alert threshold is *45* minutes.

4. Click the **advanced options** link to set advanced backup options.

   NOTE: LiteSpeed defaults typically result in the best performance. You should only modify advanced options after careful planning and testing.

   Scenario: If you need to encrypt backups, then select the encryption level and enter the encryption password. Otherwise, skip this step.

Adaptive Compression	LiteSpeed automatically selects the optimal compression based on throughput and CPU usage and optimize backups either for size or for speed (default). **NOTE:** Adaptive Compression is only available with LiteSpeed 6.5 or later; Enterprise license.
Compression level	Select 0 for no compression or 1-8 to compress the file. Higher compression levels result in smaller backup files, but they also take longer to complete. **Note:** LiteSpeed supports backing up, restoring and shipping transaction logs of the databases encrypted with transparent data encryption (TDE). If you want to compress the backup, you should choose compression level 1 to minimize CPU, since using a higher level of compression will only cause CPU to increase without any real benefit on the backup file size. If you choose compression level 0, LiteSpeed will not attempt to compress the backup. See the "Compression Methods" section of the LiteSpeed *User Guide* for more information.
Encrypt backup	Select this checkbox to encrypt the backup. Then, select the encryption level and enter the encryption password. **CAUTION:** When encrypting data, take care not to lose the encryption password; a backup cannot be restored or recovered without the original encryption password.
Compression threads	Enter the number of threads used for the backup. The default is *n-1* threads, where *n* is the number of CPU cores.
Max transfer size	Enter the maximum backup file size in bytes. . The possible values are multiples of 65536 bytes (64 KB) ranging up to 4,194,304 bytes (4 MB). The default is *1048576*.
Buffer count	Enter the number of SQL Server buffers available for a LiteSpeed operation. The default is set by SQL Server.
CPU throttle	Enter the maximum percentage of CPU that LiteSpeed can use for the process. The default is *100*.
Processor affinity	Click to select which processors LiteSpeed can use. The default is *0*, which allows LiteSpeed to use all available system processors.
Processor priority	Select the priority of the backup over other transactions or processes running on the same server. The default is *Normal*.
Logging level	Select one of the following options: • None–LiteSpeed does not write a log file for the backup or restore operation. • Verbose–LiteSpeed writes a log file for the backup or restore operation.

	• Verbose. Log file is removed on success–LiteSpeed only saves log files if the backup or restore operation fails. If it succeeds, LiteSpeed does not save the log.
Network Resilience	If LiteSpeed fails to write disk backups or reads from disk, it waits and retries the operation. You can enable and disable and control the number of times to retry and the amount of time to wait before retrying. • Number of times to retry any given read/write attempt–The default is *4 retries*. The maximum allowed setting is 1000 retries. • Wait period before each retry attempt (in seconds)–The default period to wait before retry is *15 seconds* The maximum allowed setting is 300 seconds. For more information, see Network Resilience.

5. Add one or more subscribers on the Subscribers page.

Scenario: Specify one subscriber. Select the server where you want to have a copy of the publisher database.

Recovery mode	**Loading** prevents users from querying the database. **Read-only** allows users to query the database. If you select Read-only, you should select **Disconnect users when restoring backup** to ensure that LiteSpeed can perform the restore; otherwise, you will have to manually disconnect them. **Scenario:** Select both the **Read-only** and **Disconnect users when restoring backup** options.
Copy interval (min)	The execution frequency of the copy job. By default, this job runs every *15* minutes.
Copy offset (min)	The amount of time by which you want to offset the start time of a job. Use this option to avoid overlap of backup, copy and restore operations. The default copy offset is *100* (1 minute) and the restore offset is *200* (2 minutes).
Restore interval (min)	The execution frequency of the restore job. By default, this job runs every *15* minutes.
Restore offset (min)	The amount of time by which you want to offset the start time of a job. Use this option to avoid overlap of backup, copy and restore operations. The default copy offset is *100* (1 minute) and the restore offset is *200* (2 minutes).
Database load delay (min)	The amount of time you want the subscriber database to wait before it restores the transaction log backup. Using this option you can specify how far you want a subscriber to be behind the publisher.For more information, see About Log Shipping Plans on page 5.. By default, load delay is set to *0* minutes, and backups are restored immediately when the restore job runs.
Retain backup files for (hrs)	The amount of time to store transaction log files on the subscriber. The default is *1440* (24 hours).
Restore alert threshold (min)	If no transaction log restores have occurred during this amount of time, LiteSpeed displays an alert on the monitoring tab. See View Log Shipping Activity and History for more information.The default alert threshold is *30* minutes.
Tip: The timeline represents the recurring [B]ackup, [C]opy and [R]estore job start times and helps you identify the optimal frequency of the log shipping jobs and avoid overlap of backup, copy and restore operations.	
Destination folder for copied files	The folder assigned to contain the destination copied files.

Network Resilience	If LiteSpeed fails to write disk backups or reads from disk, it waits and retries the operation. You can enable and disable and control the number of times to retry and the amount of time to wait before retrying. • Number of times to retry any given read/write attempt–The default is *4 retries*. The maximum allowed setting is 1000 retries. • Wait period before each retry attempt (in seconds)–The default period to wait before retry is *15 seconds* The maximum allowed setting is 300 seconds. For more information, see Network Resilience.

6. Complete the wizard.
   Note: You will complete the setup wizard. If an error occurs, you will have the option to initiate another attempt by clicking the Retry button. If the error persists, the Retry button will remain available.

To edit a log shipping plan (for example, to add a new Subscriber)

Right-click the plan in the Server tree and select **Edit Log Shipping Plan Wizard**...

> **Note:** You cannot edit the encryption password, because doing so would prevent the existing transaction logs from restoring.

To change roles in a existing log shipping plan

1. Select an existing log shipping plan in tree and activate Monitor tab.
2. Right-click the publisher or any of subscribers and select **Change Role** or **Select as a New Subscriber** menu items.
3. Select new publisher and define new settings for subscribers in opened **Change Role LiteSpeed Log Shipping Wizard**.

   Note: If **Perform full backup and then restore to initialize subscriber(s)** under the **Backup Options** in **Change Role LiteSpeed Log Shipping Plan Wizard** is deselected, **Continue shipping logs without full backup** option appears, and log shipping without full backup can be specified.

To delete a log shipping plan

Right-click the plan in the Server tree and select **Delete Log Shipping Plan**...

View Log Shipping Activity and History

The LiteSpeed UI Console provides information about native and LiteSpeed log shipping plans in the Log Shipping tabs. Depending on what level of the navigation pane tree you select, you can view the plans for a server, log shipping jobs, and activity history. You can view information about a category, subcategory, server instance, server group, all of your server instances, or a specific log shipping plan by selecting the appropriate level in the navigation pane tree.

NOTE: You need to register all SQL Server instances involved in log shipping in the LiteSpeed UI Console to retrieve log shipping data for them.

Tab	Level	Description
Overview	All	Displays information about the backup volume savings, successful jobs, and failed jobs. You can view information about different dates by changing the **Period** field or clicking to select the dates from a calendar.
Log Shipping Plans	Server instance	Displays all log shipping plans for the selected level with their publishing database, number of subscribers, and status. Double-click a plan to navigate to its Monitoring tab. Right-click to view the plan's jobs, properties, or refresh. **Tip:** To view current status of all log shipping plans when connecting to the server instance and when refreshing the tab, select **Tools | Options | Log Shipping** and enable the **Load log shipping plan statuses...** option.
History	Server instance and plan	**Activity log:** The History tab lists log shipping activity for the selected parameters in a grid. You can change the parameters in the following fields: • Period–Select the time span, or select dates from a calendar. • Operation–Select the type of activity to display, such as backup or restore. • Status–Select the status of the activity, such as running or success. **Errors:** If the activity had errors, double-click the row in the bottom of the pane to view the errors details. **Tip:** Export the grid to Microsoft Excel or print the grid.
Monitoring	Plan	**Monitor shipping progress:** The Monitoring tab represents the plan in a diagram with its shipping progress from the publisher to subscribers. The progress lines represent the amount of time until LiteSpeed generates an alert. You can hover over the databases and progress lines for additional information. The Monitoring tab has the following options: • Refresh–Refresh the diagram and current problems. • Properties–View the plan properties. • Display Jobs–View the plan jobs (the backup job created on publisher and copy and restore jobs created on subscriber). • Edit Log Shipping Plan–Launch the Edit Log Shipping Plan wizard. **NOTE:** If you need to synchronize the publisher and subscriber databases or reinitialize log shipping, right-click the subscriber database and select the appropriate option. For more information, see Troubleshoot Log Shipping on page 32. **View suggested solutions:** If there are any problems with the log shipping plan, LiteSpeed displays the problem and suggested solution in the bottom of the pane.

Tip: For panes that have grids, you can sort, group, move, and remove the columns:

- To sort and group the records, right-click a column header and select the appropriate options.

- To sort records against multiple columns, click column headers while holding the SHIFT key. For example, to sort by type and then by name, click the Type column header and then SHIFT+click the Name column header.
- To add or remove columns, right-click a column header and select **Column Chooser**. Add a column by dragging it from the list into the column headers. Remove a column by dragging its column header into the list.
- To move a column, drag the column header to the new location.

Convert Native SQL Server Plans

LiteSpeed for SQL Server lets you monitor both the LiteSpeed and native SQL Server log shipping plans. However, flexible backup options and ability to create, modify and reinitialize LiteSpeed log shipping plans in the LiteSpeed UI Console are only available for LiteSpeed log shipping plans.

Using LiteSpeed UI Console 5.1 or higher, you can convert native log shipping plans to LiteSpeed on the servers where you have LiteSpeed 5 or higher installed. This option is only available for SQL Server 2005 and higher.

To convert a plan to LiteSpeed

Right-click a native SQL Server log shipping plan in the Server tree and select **Convert Native Log Shipping Plan wizard**.

> **NOTE:** A native SQL Server log shipping plan cannot be recovered after it is converted to LiteSpeed.

NOTE: For more information about native SQL Server log shipping, see the following:

- http://msdn.microsoft.com/en-us/library/ms187103.aspx
- http://sqlserverpedia.com/wiki/Log_Shipping

Upgrade Log Shipping

To upgrade log shipping plans to LiteSpeed 9.1

1. Disable the LiteSpeed log shipping jobs on all servers where you plan to upgrade a previous version of LiteSpeed, before installing a new version of LiteSpeed.

   NOTE: Instead of disabling LiteSpeed jobs, you can stop SQL Server Agent on servers. If you select this option, no other backups, database maintenance, and third-party application jobs will be able to run. To disable SQL Server Agent, open SQL Server Configuration Manager, right-click SQL Server Agent and select **Stop**.
2. Upgrade LiteSpeed for SQL Server on all instances involved in log shipping.
3. Enable the LiteSpeed log shipping jobs.

   NOTE: If you stopped SQL Server Agent instead of disabling the jobs, restart it at this time. To restart SQL Server Agent, open SQL Server Configuration Manager, right-click SQL Server Agent and select **Start**.

For more information about upgrading LiteSpeed, see the Upgrade scenario in the LiteSpeed 9.1 *Installation Guide*.

To upgrade LiteSpeed log shipping plans when upgrading from SQL Server 2005 to 2008 or from SQL Server 2012 to 2014

Make sure everything is ok with the plan after the in-place upgrade. If it is not, reinitialize the plan. For more information, see Reinitialize the plan on page 33.

NOTE: If you want to migrate a database to a new server and want to continue shipping logs for this database, you will need to create a new plan. For more information, see Create Log Shipping Plans on page 8.

Use Log Shipping Stored Procedures

You can manually set up and edit LiteSpeed log shipping plans using the stored procedures.

Syntax

- The log shipping stored procedures are executed against the LiteSpeed local repository. (Usually, LiteSpeedLocal.)
- You must run the stored procedures in a set order: set up the publisher before you set up any subscribers. It is recommended that you use the Create LiteSpeed Log Shipping Plan wizard to generate the setup scripts and then review them and make necessary edits. For more information, see Create Log Shipping Plans on page 8.
- In some cases, you need to supply the plan id (@PlanID) to specify the plan. Run the following select statement on the publisher server: `SELECT * FROM LiteSpeedLocal.dbo.LogShippingPlan` and copy the relevant plan id. Alternately, right-click a plan in the server tree in the LiteSpeed UI Console and select **Properties**.

Following are several examples. For more information, see Procedures on page 19. about the stored procedures and accepted arguments.

Set up Log Shipping

/* this script executes on publisher *PublisherServer*. We declare a variable to hold the PlanID output: */

```
declare @plan_id as uniqueidentifier
declare @backup_job_id as uniqueidentifier

exec LogShipping_Add_PrimaryDatabase
@PlanName=N'Test_Plan',
@PlanDescription=N'Shipping PublisherDB log backups from PublisherServer to
SubscriberServer',
@Database = N'PublisherDB',
@PlanID = @plan_id output,
@BackupShare = N'\\PublisherServer\Share',
@BackupJobID = @backup_job_id output,
@BackupPeriod = 15,
@BackupRetentionPeriod = 1440,
@BackupAlertThreshold = 45,
@BackupDirectory = N'C:\Share\',
```

```
@MirrorBackupDirectory = N'C:\Share\',
@PerformBackup = 1

select @plan_id
```

/* this script executes on publisher *PublisherServer*: */

```
exec LogShipping_Add_PrimarySubscriber
@PrimaryDatabase = N'PublisherDB',
@SecondaryServer = N'SubscriberServer',
@SecondaryDatabase = N'SubscriberDB'
```

/* this script executes on subscriber *SubscriberServer*: */

```
declare @plan_id as uniqueidentifier
set @plan_id = N'SPECIFY PLAN ID FROM PUBLISHER' -- Specify plan ID, that was
returned from publisher
declare @fname as nvarchar(256)
set @fname = N'\\PublisherServer\Share\' + CONVERT(nvarchar(40), @plan_id) +'_
PublisherDB.bak'

exec master.dbo.xp_restore_database
@database = N'SubscriberDB',
@filename = @fname,
@filenumber = 1,
@with = N'REPLACE'
, @with = N'NORECOVERY'
, @with = N'MOVE N''PublisherDB'' TO N''C:\Program Files\Microsoft SQL
Server\MSSQL.1\MSSQL\DATA\SubscriberDB.mdf'''
, @with = N'MOVE N''PublisherDB_log'' TO N''C:\Program Files\Microsoft SQL
Server\MSSQL.1\MSSQL\DATA\SubscriberDB_Log.ldf'''
```

/* this script executes on subscriber *SubscriberServer*: */

```
declare @plan_id as uniqueidentifier
set @plan_id = N'SPECIFY PLAN ID FROM PUBLISHER' -- Specify plan ID, that was
returned from publisher
declare @restore_job as uniqueidentifier
declare @secondary as uniqueidentifier

exec LogShipping_Init_Subscriber
@PlanName=N'Test_Plan',
@PlanDescription=N'Shipping PublisherDB log backups from PublisherServer to
SubscriberServer',
@PlanID = @plan_id,
@PrimaryServer = N'PublisherServer',
@PrimaryDatabase = N'PublisherDB',
@BackupSourceDirectory = N'\\PublisherServer\Share',
@BackupDestinationDirectory = N'c:\temp',
@SecondaryDatabase = N'SubscriberDB',
@RestoreJobID = @restore_job output,
@SecondaryID = @secondary output,
@RestoreDelay = 0,
@FileRetentionPeriod = 1440,
@CopyPeriod = 15,
@RestorePeriod = 15,
@RestoreMode = 0,
```

```
@DisconnectUsers = 0,
@RestoreAlertThreshold = 30,
@RestoreAffinity = 0
```

Add Another Subscriber

/* this script executes on publisher *PublisherServer*: */

```
LogShipping_Update_PrimaryDatabase
@PlanID = N'c2a43886-5da2-40ef-b03d-693ebf185db6',
@PlanDescription=NShipping PublisherDB log backups from PublisherServer to
SubscriberServer and AnotherPublisherServer',
@PerformBackup = 1
```

/* this script executes on publisher *PublisherServer*: */

```
exec LogShipping_Add_PrimarySubscriber
@PrimaryDatabase = N'PublisherDB',
@SecondaryServer = N'AnotherSubscriberServer',
@SecondaryDatabase = N'AnotherSubscriberDB'
```

/* this script executes on subscriber *AnotherSubscriberServer*: */

```
declare @fname as nvarchar(256)
set @fname = N'\\PublisherServer\Share\c2a43886-5da2-40ef-b03d-693ebf185db6_
PublisherDB.bak'

exec master.dbo.xp_restore_database
@database = N'AnotherSubscriberDB',
@filename = @fname,
@filenumber = 1,
@with = N'REPLACE'
, @with = N'NORECOVERY'
, @with = N'MOVE N''PublisherDB'' TO N''C:\Program Files\Microsoft SQL
Server\MSSQL.1\MSSQL\DATA\AnotherSubscriberDB.mdf'''
, @with = N'MOVE N''PublisherDB_log'' TO N''C:\Program Files\Microsoft SQL
Server\MSSQL.1\MSSQL\DATA\AnotherSubscriberDB_Log.ldf'''
```

/* this script executes on subscriber *AnotherSubscriberServer*: */

```
declare @restore_job as uniqueidentifier
declare @secondary as uniqueidentifier

exec LogShipping_Init_Subscriber
@PlanName=N'Test_Plan',
@PlanDescription=NShipping PublisherDB log backups from PublisherServer to
SubscriberServer and AnotherPublisherServer',
@PlanID = N'c2a43886-5da2-40ef-b03d-693ebf185db6',
@PrimaryServer = N'PublisherServer',
@PrimaryDatabase = N'PublisherDB',
@BackupSourceDirectory = N'\\PublisherServer\Share\',
@BackupDestinationDirectory = N'c:\temp',
@SecondaryDatabase = N'AnotherSubscriberDB',
@RestoreJobID = @restore_job output,
@SecondaryID = @secondary output,
@RestoreDelay = 0,
```

```
@FileRetentionPeriod = 1440,
@CopyPeriod = 15,
@RestorePeriod = 15,
@RestoreMode = 0,
@DisconnectUsers = 0,
@RestoreAlertThreshold = 30,
@RestoreAffinity = 0,
@CopyOffset = 100,
@RestoreOffset = 200
```

Enable Logging

/* this script executes on the publisher. It only logs backup operations. */

```
exec LogShipping_Update_PrimaryDatabase
@PlanID = N'c2a43886-5da2-40ef-b03d-693ebf185db6',
@BackupLoggingLevel = 2
```

/* this script executes on subscribers. It only logs restore operations. */

```
exec LogShipping_Update_Subscriber
@PlanID = N'c2a43886-5da2-40ef-b03d-693ebf185db6',
@RestoreLoggingLevel = 2
```

Reinitialize Log Shipping

/* this script executes on the publisher: */

```
exec LogShipping_Update_PrimaryDatabase
@PlanID = 'c2a43886-5da2-40ef-b03d-693ebf185db6'
@PerformBackup = 1
```

/* this script executes on subscribers: */

```
exec LogShipping_Sync_Subscriber
@PlanID = 'c2a43886-5da2-40ef-b03d-693ebf185db6'
```

Remove LiteSpeed Log Shipping Plans

/* Run the following on all servers involved in log shipping: */

```
exec LogShipping_Remove_Plan
@PlanID = 'c2a43886-5da2-40ef-b03d-693ebf185db6'
```

Procedures

LiteSpeed uses the following log shipping procedures:

- LogShipping_Add_PrimaryDatabase
- LogShipping_Add_PrimarySubscriber
- LogShipping_Init_Subscriber
- LogShipping_Remove_Plan
- LogShipping_Remove_PrimarySubscriber
- LogShipping_Sync_Subscriber
- LogShipping_Update_PrimaryDatabase
- LogShipping_Update_Subscriber

LogShipping_Add_PrimaryDatabase

This stored procedure initializes log shipping on the publisher.

Argument	Description
@AdaptiveCompression	LiteSpeed automatically selects the optimal compression based on throughput and CPU usage and optimize backups either for size or for speed (default). **NOTE:** Adaptive Compression is only available with LiteSpeed 6.5 or later; Enterprise license.
@PlanName	A unique name to identify the plan.
@PlanDescription	A description of the plan.
@PlanID	A unique ID to identify the plan.
@Database	The name of the log shipping primary database (publisher database).
@BackupDirectory	The backup directory for the publisher. Backup files will stored in this directory. If the default is NULL, files will be backed up to the @BackupShare directory. This parameter must be specified only if @BackupShare directory is located on the same server. The publisher doesn't need network credential to store the file in the shared folder (\\myserver\share) and will use @BackupDirectory (c:\share) instead.
@MirrorBackupDirectory	The mirror backup directory for the publisher. The backup files will be copied from the original location to this directory.
@BackupRetryAttempts	The number of times (from 0 through 9999) that the job step is repeated before it is considered to have failed.
@BackupRetryInterval	The number of minutes (from 1 through 9999) that must pass before the job step is retried.

Argument	Description
@BackupShare	The network path to the backup directory (share directory).
@BackupJobName	The name of backup job, by default "LiteSpeed Log Shipping Backup - <database> - Plan: <plan name>"
@BackupRetentionPeriod	The amount of time to store transaction log files. The default is *1440* (24 hours).
@BackupAlertThreshold	If no transaction log backups have occurred during this amount of time, LiteSpeed displays an alert on the monitoring tab. See View Log Shipping Activity and History for more information.The default alert threshold is *45* minutes.
@BackupLatencyAlert	The alert ID. You can specify a different alert ID to perform different actions/notification when different log shipping plans are not in order. The default is *14420* for backup and *14421* for restore.
@BackupLatencyAlertEnabled	Determines whether the alert will be raised. The default is *1* (true).
@HistoryRetentionPeriod	The amount of time the plan history will be retained. The default is *1440* (24 hours).
@BackupJobID	A unique identifier for the backup job.
@Overwrite	Determines if LiteSpeed will delete the existing log shipping plans. This argument accepts one of the following values: • 0–False (default) • 1–True
@BackupScheduleName	The name for the backup schedule. The default is "LSBackupSchedule".
@BackupPeriod	The execution frequency of the backup job. By default, this job runs every *15* minutes.
@BackupMaxCPUUsage	The maximum CPU usage during transaction log backup. The default value will be used, if this argument is not passed.
@BackupPriority	Specifies the priority of the LiteSpeed process compared to other processes running on the same server. This argument accepts one of the following values: • 0–Normal (Default) • 1–AboveNormal • 2–High The default value will be used, if this argument is not passed.
@BackupBufferCount	Specifies the number of SQL Server buffers available for a LiteSpeed

Argument	Description
	operation. The default value is set by SQL Server. The default value will be used, if this argument is not passed.
@BackupCompression	Specifies the compression level for the backup. Valid values are 0 through 8. 0 bypasses the compression routines. The remaining values of 1 through 8 specify compression with increasingly aggressive computation. *2* is the default value for disk backups and *7* is the default value for cloud backups. The default value will be used, if this argument is not passed.
@BackupAffinity	The default value will be used, if this argument is not passed. For more information about processor affinity, please refer to the LiteSpeed *User Guide*.
@BackupThreads	Determines the number of threads used for the backup. You will achieve the best results by specifying multiple threads, but the exact value depends on several factors including: processors available, affinity setting, compression level, encryption settings, IO device speed, and SQL Server responsiveness. The default is *n*-1 threads, where *n* is the number of processors. The default value will be used, if this argument is not passed.
@BackupMaxTransferSize	Specifies the largest unit of transfer in bytes to be used between SQL Server and LiteSpeed. The possible values are multiples of 65536 bytes (64 KB) ranging up to 4,194,304 bytes (4 MB). The default is 1048576 (1 MB).
@BackupLoggingLevel	Specifies the backup logging level. This argument accepts one of the following values: • 0–Logging off (default). • 1 or any odd value–Logging on. Log file is removed on success. • 2 or any even value–Logging on. The default output directory on the Publisher server is *C:\Documents and Settings\All Users\Application Data\Quest Software\LiteSpeed\SQL Server\Logs (or C:\ProgramData\Quest Software\LiteSpeed\SQL Server\Logs)*. Please refer to the*LiteSpeed User Guide* for more information about logging in LiteSpeed.
@BackupEncryptionLevel	Specifies the backup encryption level. The default is *0* (encryption is not in use).
@BackupPassword	The backup password. The default is NULL.
@PlanEnabled	The LogShipping plan is enabled.
@PerformBackup	Determines whether LiteSpeed will perform a full backup of the database to the backup folder. You can use this argument to automatically create a backup on the publisher and restore the backup on the subscriber.

LogShipping_Add_PrimarySubscriber

Adds a subscriber.

Argument	Description
@PrimaryDatabase	The name of the log shipping primary database (publisher database).
@SecondaryServer	The name of the subscriber server.
@SecondaryDatabase	The name of the log shipping subscriber database.

LogShipping_Init_Subscriber

Initializes log shipping on the subscriber.

Argument	Description
@PlanEnabled	The LogShipping plan is enabled.
@PlanName	A unique name to identify the plan. You must specify either the PlanID or the PlanName to add a server to that plan.
@PlanDescription	A description of the plan.
@PlanID	A unique ID to identify the plan. It must be the ID received from the publisher to correctly identify plans on the publisher and subscriber.
@PrimaryServer	The primary server name.
@PrimaryDatabase	The name of the log shipping primary database (publisher database).
@BackupSourceDirectory	The network path to the backup directory (share directory).
@BackupDestinationDirectory	The destination directory on subscriber where backup files are copied.
@SecondaryDatabase	The name of the log shipping subscriber database.
@CopyJobName	The name of the copy job. The default is "LiteSpeed Log Shipping File Copy - <primary database> - Plan: <plan name>".
@CopyOffset	The amount of time by which you want to offset the start time of a job. Use this option to avoid overlap of backup, copy and restore operations. The default copy offset is *100* (1 minute) and the restore offset is *200* (2 minutes).
@RestoreJobName	The name of the restore job. The default is "LiteSpeed Log Shipping Restore - <primary database> - Plan: <plan name>".

Argument	Description
@FileRetentionPeriod	The amount of time to store transaction log files on the subscriber. The default is *1440* (24 hours).
@CopyScheduleName	The name for the copy schedule. The default is "LSCopySchedule".
@CopyPeriod	The execution frequency of the copy job. By default, this job runs every *15* minutes.
@CopyJobID	A unique identifier for the copy job.
@RestoreScheduleName	The name for the restore schedule. The default is "LSRestoreSchedule".
@RestorePeriod	The execution frequency of the restore job. By default, this job runs every *15* minutes.
@RestoreOffset	The amount of time by which you want to offset the start time of a job. Use this option to avoid overlap of backup, copy and restore operations. The default copy offset is *100* (1 minute) and the restore offset is *200* (2 minutes).
@RestoreJobID	A unique identifier for the restore job.
@SecondaryID	A unique identifier of the plan ID in native tables.
@RestoreDelay	The amount of time you want the subscriber database to wait before it restores the transaction log backup. Using this option you can specify how far you want a subscriber to be behind the publisher.For more information, see About Log Shipping Plans on page 5.. By default, load delay is set to *0* minutes, and backups are restored immediately when the restore job runs.
@RestoreAll	Determines whether all transaction logs are restored. This argument accepts one of the following values: • 0–Restores only the first transaction log backup. • 1–Restores all available transaction log backups when the restore job starts. This is the default.
@RestoreMode	Determines the restore mode. This argument accepts one of the following values: • 0–No recovery. This is the default. • 1–Standby.
@DisconnectUsers	Disconnect users on executing restore (in standby mode only). The default is *0* (users will not be disconnected).

Argument	Description
@RestoreAlertThreshold	If no transaction log restores have occurred during this amount of time, LiteSpeed displays an alert on the monitoring tab. See View Log Shipping Activity and History for more information. The default alert threshold is *30* minutes.
@RestoreLatencyAlert	The alert ID. You can specify a different alert ID to perform different actions/notification when different log shipping plans are not in order. The default is *14420* for backup and *14421* for restore.
@RestoreLatencyAlertEnabled	Determines whether the alert will be raised. The default is *1* (true).
@HistoryRetentionPeriod	The amount of time the plan history will be retained. The default is *1440* (24 hours).
@Overwrite	Determines if LiteSpeed will delete the existing log shipping plans. This argument accepts one of the following values: • 0–False (default) • 1–True
@RestorePassword	The restore password. The default value will be used, if this argument is not passed.
@RestoreAffinity	The default value will be used, if this argument is not passed. For more information about processor affinity, please refer to the LiteSpeed *User Guide*.
@RestoreLoggingLevel	Specifies the logging level for restoring backups. This argument accepts one of the following values: • 0–Logging off (default). • 1 or any odd value–Logging on. Log file is removed on success. • 2 or any even value–Logging on. The default output directory on the Publisher server is *C:\Documents and Settings\All Users\Application Data\Quest Software\LiteSpeed\SQL Server\Logs (or C:\ProgramData\Quest Software\LiteSpeed\SQL Server\Logs)*. Please refer to the*LiteSpeed User Guide* for more information about logging in LiteSpeed.
@PerformRestore	Determines whether the subscriber's database will be restored from the backup share folder. This argument accepts one of the following values: • 0–False (default) • 1–True
@RestoreDataDestinationDirectory	Specifies a directory where the database will be restored. The default is NULL (default SQL Server directory will be used).

Argument	Description
	NOTE: The LogShipping_Init_Subscriber procedure accepts this argument only if @PerformRestore=1.
@RestoreLogDestinationDirectory	Specifies a directory where the log file will be restored. The default is NULL (default SQL Server directory will be used). **NOTE:** The LogShipping_Init_Subscriber procedure accepts this argument only if @PerformRestore=1.
@RetryAttempts	The number of times (from 0 through 9999) that the job step is repeated before it is considered to have failed.
@RetryInterval	The number of minutes (from 1 through 9999) that must pass before the job step is retried.

LogShipping_Remove_Plan

Remove a plan from the publisher and subscribers. It must be run on all servers involved in log shipping.

Argument	Description
@PlanID	A unique ID to identify the plan.
@SubscriberOnly	Removes information about the subscriber on the server that is the publisher and subscriber at the same time. This argument accepts one of the following values: • 0–False (default) • 1–True

LogShipping_Remove_PrimarySubscriber

Removes a subscriber.

Argument	Description
@PrimaryDatabase	The name of the log shipping primary database (publisher database).
@SecondaryServer	The name of the subscriber server.
@SecondaryDatabase	The name of the log shipping subscriber database.

LogShipping_Sync_Subscriber

This stored procedure restores subscriber's database from the backup file in the share directory. Before executing this procedure you must put the backup file in the backup share (manually or using @PerformBackup of the LogShipping_Update_PrimaryDatabase procedure).

Argument	Description
@DisconnectUsers	Disconnect users on executing restore (in standby mode only). This argument accepts one of the following values: • 0–Do not disconnect users (default). • 1–Disconnect users.
@PlanID	A unique ID to identify the plan.

LogShipping_Update_PrimaryDatabase

Updates the publisher.

Argument	Description
@PlanName	A unique name to identify the plan.The default value will be used, if this argument is not passed.
@PlanDescription	A description of the plan. The default value will be used, if this argument is not passed.
@PlanID	A unique ID to identify the plan.
@BackupDirectory	The backup directory for the publisher. Backup files will stored in this directory. If the default is NULL, files will be backed up to the @BackupShare directory. This parameter must be specified only if @BackupShare directory is located on the same server. The publisher doesn't need network credential to store the file in the shared folder (\\myserver\share) and will use @BackupDirectory (c:\share) instead.
@MirrorBackupDirectory	The mirror backup directory for the publisher. The backup files will be copied from the original location to this directory.
@BackupShare	The network path to the backup directory (share directory).
@BackupRetentionPeriod	The amount of time to store transaction log files. The default is *1440* (24 hours).
@BackupAlertThreshold	If no transaction log backups have occurred during this amount of time, LiteSpeed displays an alert on the monitoring tab. See View Log Shipping Activity and History for more information. The default alert threshold is *45* minutes.
@BackupLatencyAlert	The alert ID. You can specify a different alert ID to perform different actions/notification when different log shipping plans are not in order. The default is *14420* for backup and *14421* for restore.
@BackupLatencyAlertEnabled	Determines whether the alert will be raised. The default is *1* (true).
@HistoryRetentionPeriod	The amount of time the plan history will be retained. The default is *1440* (24

Argument	Description
	hours).
@BackupPeriod	The execution frequency of the backup job. By default, this job runs every *15* minutes.
@BackupMaxCPUUsage	The maximum CPU usage during transaction log backup. The default value will be used, if this argument is not passed.
@BackupPriority	Specifies the priority of the LiteSpeed process compared to other processes running on the same server. This argument accepts one of the following values: • 0–Normal (Default) • 1–AboveNormal • 2–High
@BackupBufferCount	Specifies the number of SQL Server buffers available for a LiteSpeed operation. The default value is set by SQL Server. The default value will be used, if this argument is not passed.
@BackupCompression	Specifies the compression level for the backup. Valid values are 0 through 8. 0 bypasses the compression routines. The remaining values of 1 through 8 specify compression with increasingly aggressive computation. *2* is the default value for disk backups and *7* is the default value for cloud backups. The default value will be used, if this argument is not passed.
@BackupAffinity	Specifies the affinity mask for the process. The mask is a 64-bit integer value. By default, it is *0* and will utilize all CPUs. The default value will be used, if this argument is not passed. For more information about processor affinity, please refer to the LiteSpeed *User Guide*.
@BackupThreads	Determines the number of threads used for the backup. You will achieve the best results by specifying multiple threads, but the exact value depends on several factors including: processors available, affinity setting, compression level, encryption settings, IO device speed, and SQL Server responsiveness. The default is *n*-1 threads, where *n* is the number of processors. The default value will be used, if this argument is not passed.
@BackupMaxTransferSize	Specifies the largest unit of transfer in bytes to be used between SQL Server and LiteSpeed. The possible values are multiples of 65536 bytes (64 KB) ranging up to 4,194,304 bytes (4 MB). The default is 1048576 (1 MB). The default value will be used, if this argument is not passed.
@BackupLoggingLevel	Specifies the backup logging level. This argument accepts one of the following values:

Argument	Description
	• 0–Logging off (default). • 1 or any odd value–Logging on. Log file is removed on success. • 2 or any even value–Logging on. The default output directory on the Publisher server is *C:\Documents and Settings\All Users\Application Data\Quest Software\LiteSpeed\SQL Server\Logs (or C:\ProgramData\Quest Software\LiteSpeed\SQL Server\Logs)*. Please refer to the*LiteSpeed User Guide* for more information about logging in LiteSpeed.
@BackupEncryptionLevel	Specifies the backup encryption level. The default is *0* (encryption is not in use).
@AdaptiveCompression	Automatically selects the optimal compression level based on CPU usage or Disk IO. For more information, see Compression Methods. You can tell Adaptive Compression to optimize backups either for size or for speed. This argument accepts one of the following values: • Size • Speed
@BackupRetryAttempts	The number of times (from 0 through 9999) that the job step is repeated before it is considered to have failed.
@BackupRetryInterval	The number of minutes (from 1 through 9999) that must pass before the job step is retried.
@PlanEnabled	The LogShipping plan is enabled.
@PerformBackup	Determines whether LiteSpeed will perform a full backup of the database to the backup folder. You can use this argument to automatically create a backup on the publisher and restore the backup on the subscriber.

LogShipping_Update_Subscriber

Updates the subscriber.

Argument	Description
@PlanName	A unique name to identify the plan. You must specify either the PlanID or the PlanName to add a server to that plan.
@PlanDescription	A description of the plan. The default is *NULL*.
@PlanID	A unique ID to identify the plan. It must be the ID received from the publisher to correctly identify plans on the publisher and subscriber.

Argument	Description
@BackupSourceDirectory	The network path to the backup directory (share directory).
@BackupDestinationDirectory	The destination directory on subscriber where backup files are copied.
@FileRetentionPeriod	The amount of time to store transaction log files on the subscriber. The default is *1440* (24 hours).
@CopyPeriod	The execution frequency of the copy job. By default, this job runs every *15* minutes.
@RestorePeriod	The execution frequency of the restore job. By default, this job runs every *15* minutes.
@RestoreDelay	The amount of time you want the subscriber database to wait before it restores the transaction log backup. Using this option you can specify how far you want a subscriber to be behind the publisher.For more information, see About Log Shipping Plans on page 5..By default, load delay is set to *0* minutes, and backups are restored immediately when the restore job runs.
@RestoreAll	Determines whether all transaction logs are restored. This argument accepts one of the following values: • 0–Restores only the first transaction log backup. • 1–Restores all available transaction log backups when the restore job starts. This is the default.
@RestoreMode	Determines the restore mode. This argument accepts one of the following values: • 0–No recovery. This is the default. • 1–Standby.
@DisconnectUsers	Disconnect users on executing restore (in standby mode only). The default is *0* (users will not be disconnected).
@RestoreAlertThreshold	If no transaction log restores have occurred during this amount of time, LiteSpeed displays an alert on the monitoring tab. See View Log Shipping Activity and History for more information.The default alert threshold is *30* minutes.
@RestoreLatencyAlert	The alert ID. You can specify a different alert ID to perform different actions/notification when different log shipping plans are not in order. The default is *14420* for backup and *14421* for restore.
@RestoreLatencyAlertEnabled	Determines whether the alert will be raised. The default is *1* (true).
@HistoryRetentionPeriod	The amount of time the plan history will be retained. The default is *1440* (24 hours).
@RestoreAffinity	The default value will be used, if this argument is not passed. For more information about processor affinity, please refer to the LiteSpeed *User Guide*.

Argument	Description
@RestoreLoggingLevel	Specifies the logging level for restoring backups. This argument accepts one of the following values: • 0–Logging off (default). • 1 or any odd value–Logging on. Log file is removed on success. • 2 or any even value–Logging on. The default output directory on the Publisher server is *C:\Documents and Settings\All Users\Application Data\Quest Software\LiteSpeed\SQL Server\Logs (or C:\ProgramData\Quest Software\LiteSpeed\SQL Server\Logs)*. Please refer to the*LiteSpeed User Guide* for more information about logging in LiteSpeed.
@RestorePassword	The restore password. Default is Null. The default value will be used, if this argument is not passed.
@CopyOffset	Specifies the number of rows to skip when running copy.
@PlanEnabled	The LogShipping plan is enabled.
@RestoreOffset	Specifies the number of rows to skip when running a restore.
@RetryAttempts	The number of times (from 0 through 9999) that the job step is repeated before it is considered to have failed.
@RetryInterval	The number of minutes (from 1 through 9999) that must pass before the job step is retried.

Troubleshoot Log Shipping

NOTE: For all log shipping scenarios, the best is to upgrade all of your servers to the latest LiteSpeed version.

Synchronize subscribers

To synchronize subscribers, you will need to create a transaction log backup of the Publisher database and then restore it to the Subscriber. Log shipping plan status is updated immediately after the synchronization is complete.

You may need to synchronize the Publisher and Subscriber in the following scenarios:

- The Monitoring tab displays the overdue restoring task.

- Some transaction log backup files had been removed from the publisher before they got to the Subscriber or they were manually removed from the Subscriber.
- Subscriber server goes offline. (This will not stop backups from occurring or stop other subscribers from updating). Synchronize subscriber when the Subscriber server is online.

  If the Subscriber is permanently offline you will need to delete the existing plan and create a new log shipping plan.

To synchronize the publisher and subscriber databases

Do one of the following:

- Right-click a subscriber database in the Monitoring tab and select **Synchronize...**.
- Run the following:
  /* On the publisher */

```
EXEC  msdb..sp_start_job  @job_id  =  '<backup_job_id>'
GO
```

  /* On the subscribers */

```
EXEC  msdb..sp_start_job  @job_id  =  '<copy_job_id>'
GO
```

  /* On the subscribers */

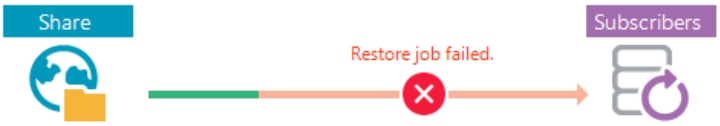
```
EXEC msdb..sp_start_job @job_id = '<restore_job_id>'
```

Tip: To obtain job ids, right-click a subscriber database in the Monitoring tab and select **Synchronize...**, and then click **View Script**.

Reinitialize the plan

When you reinitialize the plan, LiteSpeed creates a full backup file with the <Publisher database>.bak name in backup share folder and then restores the backup directly to the Subscriber.

You may need to reinitialize log shipping, if the restore job fails.



The restore job may fail in the following cases:

- The job is disabled.
- Backup folder cannot be found.
- Access to shared backup folder is denied.
- LiteSpeed for SQL Server has been removed from the subscriber server.
- The publisher database has been renamed, or removed, or not accessible.
- The t-log was manually backed up on the Publisher and there were database changes.
- Database is not in the "Stand by" or "No Recovery" state.
- Synchronizing subscribers failed.

NOTE: Before you reinitialize log shipping, you need to fix the errors and prevent them from occurring in future.

To reinitialize log shipping

Right-click the Subscriber database in the Monitoring tab and select **Reinitialize**.

NOTES: When you reinitialize log shipping, the plan status is updated only after usual backup transaction log, copy and restore jobs are completed.

You can also re-initialize log shipping using stored procedures. For more information, see Reinitialize Log Shipping on page 19.

Bring the subscriber online

You may need to bring the Subscriber online, if you have a Log Shipping plan setup and the publisher fails.

To bring the Subscriber online

1. Stop any LiteSpeed Log Shipping jobs.
2. Run restore database with recovery to bring the subscriber database online.
3. Remove the plan and setup the Log Shipping plan again.

Reverse log shipping roles

You may use the following instructions to make a subscriber act as a publisher and vice versa.

To reverse log shipping roles

1. Delete the log shipping plan. For more information, see To delete a log shipping plan on page 13.
2. Restore the subscriber database with recovery.
3. Create a new log shipping plan. For more information, see Create Log Shipping Plans on page 8.

Manually remove log shipping plan components

For more information, see Remove LiteSpeed Log Shipping Plans on page 19.

'Failed to login' error on 64-bit platform

If you use an alias to connect to a SQL Server with non-standard TCP port, the log shipping job may fail on a x64 platform with the 'Failed to login' error.

To workaround this issue

You have to define an alias for **both 64-bit and 32-bit** server configurations.

Log Shipping utility (SLSLogShip.exe) works as a 32-bit application on x64 platforms and uses x32 alias configuration.

Adjust copy settings

Log Shipping uses robocopy to internally move LiteSpeed files. Log Shipping began using the robocopy tool to copy files from the source to the target since LiteSpeed release 7.5. Robocopy is supported for Windows 7, Windows 8, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012 and above. Beginning with LiteSpeed release 8.0, the robocopy parameters can be changed in the Log Shipping section of the .ini file. The .ini file available values and default values are displayed below. Further information about robocopy is available at: http://technet.microsoft.com/en-us/library/cc733145.aspx.

Available values:
[logshipping]
userobocopy = true/false
numberofretries = decimal
waittimebetweenretries = decimal
numberofthreads = decimal (the parameter applies to Windows Server 2008 R2 and Windows 7 only)
copymode = zb/z/b

Default values:
[logshipping]
userobocopy = true
numberofretries = 60
waittimebetweenretries = 10
numberofthreads = 8
copymode = z

Create Support Bundles

If you have not found an answer to your question, you can create a support bundle and send it to customer support. The support bundle contains information about your database, system configuration, and settings and can help troubleshoot problems.

To create a LiteSpeed UI Console support bundle

Select **Application button | Help | Support Bundle**.

To create a server support bundle

1. Right-click a server in the tree and select **Support | LiteSpeed Core Details**.
2. Send the support bundle to Quest Software customer support or click **Clipboard** to save the generated content to file.

About us

We are more than just a name

We are on a quest to make your information technology work harder for you. That is why we build community-driven software solutions that help you spend less time on IT administration and more time on business innovation. We help you modernize your data center, get you to the cloud quicker and provide the expertise, security and accessibility you need to grow your data-driven business. Combined with Quest's invitation to the global community to be a part of its innovation, and our firm commitment to ensuring customer satisfaction, we continue to deliver solutions that have a real impact on our customers today and leave a legacy we are proud of. We are challenging the status quo by transforming into a new software company. And as your partner, we work tirelessly to make sure your information technology is designed for you and by you. This is our mission, and we are in this together. Welcome to a new Quest. You are invited to Join the Innovation™.

Our brand, our vision. Together.

Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q itself symbolizes our need to add the missing piece – you – to the community, to the new Quest.

Contacting Quest

For sales or other inquiries, visit www.quest.com/contact.

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at https://support.quest.com.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request
- View Knowledge Base articles
- Sign up for product notifications
- Download software and technical documentation
- View how-to-videos
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product

Third-party contributions

This product contains the following third-party components. For third-party license information, go to https://www.quest.com/legal/license-agreements.aspx. Source code for components marked with an asterisk (*) is available at https://opensource.quest.com.

Table 1: List of Third-Party Contributions

Component	License or acknowledgement
ActiPro Syntax Editor (for Windows Forms) 4.0	ActiPro Syntax Editor (for Windows Forms) 4.0 Copyright (c) 2002-2019 Actipro Software LLC. All rights reserved.
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