LiteSpeed® Engine for SQL Server 2.0.3

User Guide

Legend

■ | **WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.**

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

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

LiteSpeed Engine User Guide
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Introduction

About LiteSpeed Engine for SQL Server

LiteSpeed® Engine for SQL Server allows for seamless data compression and encryption without having to modify existing SQL scripts.

The LiteSpeed Engine solution consists of two parts, which are both installed by default:

- **File driver component**—This does the actual work of compressing and optionally encrypting your SQL Server database backups. It works by intercepting the backup file stream and compressing the results before reaching the actual physical disk. If restoring a database, the operation is reversed, the file stream is decompressed before reaching SQL Server.

  With each backup, LiteSpeed Engine generates an .lsi file in the same directory as the SQL Server backup file. It has the same name as the backup file, but is appended with the .lsi file extension. This file is used to map backup information and optimize restore times. If it is deleted or otherwise unavailable at the time of restore, the file will be regenerated using information contained within the backup file.

- **Configuration Editor**—This is a UI application that, among other things, allows you to determine what SQL Server backup files (based on their extension) are going to be compressed and/or encrypted.

Once installed and configured, the driver will work transparently in the background, compressing and decompressing and optionally encrypting and de-encrypting your SQL Server backups and restores.

Compatibility with LiteSpeed for SQL Server

LiteSpeed Engine for SQL Server is a complementary technology to LiteSpeed for SQL Server (LiteSpeed). By providing LiteSpeed's compression and encryption functionality in a driver based solution, you can continue using native or third party backup tools, while getting the full advantage and flexibility of LiteSpeed's time and space saving features.

LiteSpeed for SQL Server is a fast and flexible backup and recovery solution that allows database administrators to easily maintain complete control over the backup and recovery process. LiteSpeed's low-impact, high-performance compression and encryption technology helps reduce storage costs and protect data, while maintaining a high level of recoverability.

A LiteSpeed Engine backup can be restored with either LiteSpeed or LiteSpeed Engine.

The following table compares the different versions of LiteSpeed for SQL Server compatible with LiteSpeed Engine:

Feature	LiteSpeed 5.2	LiteSpeed 6.0	LiteSpeed 6.1 and higher
Can restore backups created with LiteSpeed Engine 1.1.	Yes	Yes	Yes
Can restore backups created with LiteSpeed Engine 2.0.	No	Yes*	Yes
Can create backups that are restorable by LiteSpeed Engine 2.0. (This functionality may be useful for environments, which only have LiteSpeed Engine installed.)	No	No	Yes**

*—May be not restorable, if encryption options were changed for appended backups.

**—If a backup is created using the new @LSECompatible (xp) and --LSECompatible (command-line) parameters implemented in LiteSpeed. See the LiteSpeed 6.x online help for more information. Also, an appended backup is restorable, but the previous backups become invisible.

NOTE: Forward compatibility is not supported.

System Requirements

Before installing LiteSpeed Engine for SQL Server, ensure your system meets the following minimum hardware requirements:

Processor	Follow the recommendations for the SQL Server version used.
Disk Space	25 MB of disk space for installation. **NOTE**: The disk space required may vary based on options selected during installation.
Memory	Follow the recommendations for the SQL Server version used. **NOTE**: The memory required for SQL Server may vary based on the following: • Applications that are running on your system • Size and complexity of the database • Amount of database activity • Number of concurrent users accessing the database
Monitor & Resolution	SVGA with a minimum resolution of 1024x768.

and software requirements:

Operating System	Microsoft Windows Server 2003 32-bit and 64-bit (x64) (All Service Packs) Microsoft Windows Server 2003 R2 32-bit and 64-bit (x64) (All Service Packs) Microsoft Windows Server 2008 32-bit and 64-bit (x64) (All Service Packs) Microsoft Windows Server 2008 R2 64-bit (x64) (All Service Packs) Microsoft Windows Server 2012 64-bit (x64) (All Service Packs) Microsoft Windows Server 2012 R2 64-bit (x64) (All Service Packs) Microsoft Windows XP 32-bit and 64-bit (x64) (All Service Packs) Microsoft Windows Vista 32-bit and 64-bit (x64) (All Service Packs) Microsoft Windows 7 32-bit and 64-bit (x64) (All Service Packs) Microsoft Windows 8 32-bit and 64-bit (x64) (All Service Packs)

	Microsoft Windows 8.1 32-bit and 64-bit (x64) (All Service Packs)
Database Software	SQL Server 2000 32-bit and 64-bit (All Service Packs)
	SQL Server 2005 32-bit and 64-bit (x64) (All Service Packs)
	SQL Server 2008 32-bit and 64-bit (x64) (All Service Packs)
	SQL Server 2008 R2 32-bit and 64-bit (x64) (All Service Packs)
	SQL Server 2012 32-bit and 64-bit (x64) (All Service Packs)
	SQL Server 2014 32-bit and 64-bit (x64) (All Service Packs)
Additional Software	.Net Framework 2.0 or above installed before you install the LiteSpeed Engine Configuration Editor.
	Adobe Reader 8 to view the User guide.

Installation

NOTE: The installation and configuration wizard must be run by a user that has administrator and DBA privileges.

Prior to installation you may need to gather the following information:

- Licensing information
- Installation directory for the LiteSpeed Engine Configuration Editor (optional)

To install LiteSpeed Engine

Launch the appropriate .msi file and follow the prompts.

If you are running Windows on...	Select...
a 32-bit system	LiteSpeedEngineSQLServer.msi
a 64-bit system	LiteSpeedEngineSQLServer-x64.msi

By default, the application files are installed in the *C:\Program Files\Quest Software\LiteSpeed\Engine* directory. The following start menu shortcuts are installed during a complete installation:

- Refresh Driver Configuration—To force the driver to re-read configuration when the configuration file is manually updated.
- Rescan for new Drives—To be able to do compressed backups to the new drives added to your system.
- LiteSpeed Engine Configuration—To specify backup extensions to be monitored and configure compression and encryption options.

NOTE: If you do not want, or are unable, to install the .NET Framework on the remote servers, you will not be able to install the LiteSpeed Engine Configuration editor. In this case, select a Custom installation and install only the driver. For more information, see on how to configure and update the remote server.

To upgrade LiteSpeed Engine

This version of LiteSpeed Engine for SQL Server supports automatic upgrade from versions 1.x and 2.x. Run the LiteSpeed Engine 2.0 installer. It will uninstall the previous version automatically and prompt for a reboot.

Reboot the computer and complete installation. If it does not start back up after rebooting, you should manually run the installer.

To uninstall LiteSpeed Engine

1. Select LiteSpeed Engine for SQL Server from the Add or Remove Programs option in the Control Panel.

2. After uninstalling LiteSpeed Engine re-boot the server.

License LiteSpeed Engine

LiteSpeed Engine will work with either a LiteSpeed Engine for SQL Server license or a LiteSpeed for SQL Server Enterprise license. You may view or update licensing information using the **Help | License** option.

NOTES:

- The license information is case sensitive. Please ensure that your license information is valid and entered accurately.

- If the current license is expired, LiteSpeed Engine will create an entry in the Window's Event Log. License error messages are only logged once per backup or upon reboot, so you may have to review the Event Log history to locate the message. You can quickly retrieve LiteSpeed Engine related Event Log entries by selecting **Help | Support Bundle** and clicking **View log**.

Configuration

About LiteSpeed Engine Configurations

A configuration file contains the file extensions to be monitored, as well as the compression level and encryption level employed by LiteSpeed Engine when creating a backup of the monitored file. By default, LiteSpeed Engine is configured to backup using Compression Level 1 without encryption. You may change these settings at any time. If no custom file extension settings are saved to the configuration file, only native SQL backups will occur.

Configuration settings are saved to the default .ini file (LSBackFilter.ini) and are saved in the *Documents and Settings\All Users\Application Data\Quest Software\LiteSpeed\Engine* directory. (The default location for the ini file on Windows Vista is: *ProgramData\Quest Software\LiteSpeed\Engine*.)

The default location is specified by the `HKEY_LOCAL_MACHINE\Software\Quest Software\LiteSpeedEngine\IniPath` registry key.

NOTE: The driver currently only updates using the default file name and from the default location.

Contents of a Configuration File (.ini)

The configuration file is comprised of two main sections, the GLOBAL section and a sequentially numbered EXTENSION section for each custom file extension. The GLOBAL section contains licensing key information.

The EXTENSION section(s) are sequentially numbered according to the order in which they are entered. Each section contains information on the saved custom file extension settings. These setting may include the following:

- FILE_EXTENSION (to which the section applies)
- COMPRESSION_LEVEL
- ENCRYPTION_LEVEL
- RESTORE_PASSWORD (if the Include restore password... option is enabled)

- ENCRYPTION_PASSWORD (if the Store password encrypted option is enabled)
- CLEARTEXT_PASSWORD (if the Store password encrypted option is disabled)

NOTE: You need to update driver configuration each time you manually edit the configuration file. For more information, see Manage Configuration Files on page 13.

Customize Your Configuration

To add a file extension

1. With your configuration file open, select the **Edit | Add Extension** option.

2. Select the extension for monitoring from the defaults list, or manually enter an extension by clicking in the text portion of the drop down list. (This extension will be available from the drop down list the next time you add or edit an extension.) Review the following for additional information:

Option	Description
Extension	File extensions available for monitoring: - User Defined (Up to 16 characters in length.) - BAK - BKE - LSB - BKP - EXE - TRN
Compression Level	The degree of data compression:

	None	Data will not be compressed.
	1	Medium Compression—for servers where minimal CPU utilization is preferred at the expense of some compression.
	2	Medium-High Compression—a new highly optimized low CPU algorithm for environments where low CPU utilization is preferred but with improved compression over level 1.
	3, 4, 5, 6	High Compression—for databases where balanced compressed backup size and CPU utilization is important.
	7, 8	Extreme Compression—a new highly optimized extreme compression algorithm for databases where compressed size is very important with only a slight increase in CPU utilization over previous levels.

Option	Description
Encryption Level	Encryption algorithms used to encrypt data: - None (Data will not be encrypted.)

Option	Description
	• 64-bit RC2
	• 112-bit RC2
	• 128-bit RC2
	• 168-bit 3DES
	• 128-bit AES
	• 192-bit AES
	• 256-bit AES
Encryption Password	*1* to *255* characters. This parameter is only set when data is encrypted. The user must maintain the password for each encrypted backup file. For appended backup files, the password must be available at the time of each backup, as SQL Server reads previous backup information, and therefore LiteSpeed must be able to decrypt that information when requested. **CAUTION:** If the password for a file extension is changed, previous backups cannot be restored until the proper password is re-associated with that file extension. Alternately, the file can be renamed to a new extension which is assigned the previous password.

NOTES:

- By default, configuration settings are saved to the default .ini file.
- Additions or edits may not be viewed in the .ini file until the configuration is saved.
- Manually entered file extension can be removed from the drop-down list by removing the extension from the Available extensions list using the **Tools | Options** menu option.

Manage Configuration Files

When you save a customized configuration in the LiteSpeed Engine Configuration editor, the driver is automatically updated with the new configuration settings. If you open the .ini file and edit it manually, the driver must be manually updated. This may be accomplished by opening the configuration file designed for the local server and selecting the **File | Driver Management | Refresh driver configuration** option. Alternately, you may simply resave the configuration file for the local server. This will force a driver update on the local server.

If you did not install the LiteSpeed Engine Configuration editor on the server and need to refresh the driver, run UpdateDriver.exe on that server. For more information, see Refresh the Driver Using UpdateDriver.exe on page 15.

The configuration file can be saved with any name and to any location to be used on another machine, that is particularly useful when you are managing configurations for multiple servers from a remote location.

To create a configuration for use on another server

1. Modify the current configuration.
2. Save the changes with any name and to any location using the **File | Save As** option.

To open a configuration for viewing and editing

Select **File | Open** and select the desired .ini file. (If your file extension settings are saved to an .ini file other than the default.)

To view the default configuration file

Launch LiteSpeed Engine Configuration from **Start | All Programs | Quest Software | LiteSpeed Engine for SQL Server**.

Manage Remote Servers

You can remotely manage configurations without installing the LiteSpeed Engine Configuration editor on the remote server.

To configure and update the remote servers

1. Do one of the following:
   - Use LiteSpeed Engine Configuration editor on another computer to create the .ini file and then save it to the default directory of the remote SQL server. For more information, see About LiteSpeed Engine Configurations on page 11. on the configuration file default location.
   - Manually edit the .ini file on the SQL server. Copy the LICENSE key from the GLOBAL section of the .ini file and paste it into the GLOBAL section of the .ini file on the SQL server. For more information, see Contents of a Configuration File (.ini) on page 11..

2. After the configuration file has been edited and saved to the default directory of the SQL server, run the UpdateDriver.exe application on the SQL server. For more information, see Refresh the Driver Using UpdateDriver.exe on page 15.

   If the .ini file is not saved to the default location, refer to the `HKEY_LOCAL_MACHINE\Software\Quest Software\LiteSpeedEngine\IniPath` registry key. Please exercise caution when using the Windows Registry Editor.

Considerations for Clustered Systems

For cluster installs, you need to install LiteSpeed Engine on all relevant nodes. For more information, see To install LiteSpeed Engine on page 8.

Configure each node to look for the same backup extensions. This can either be done manually on each node or you can create the .ini file on a single node and then copy it to the other nodes. For more information, see About LiteSpeed Engine Configurations on page 11. on the default configuration directory.

If you copied the .ini file to all nodes, refresh the driver configuration on each node. Select **File | Driver management | Refresh driver configuration** or run the UpdateDriver.exe. For more information, see Refresh the Driver Using UpdateDriver.exe on page 15.

NOTE: As an alternative to the above, you can locate the .ini configuration file in a shared UNC path location, then you will need to specify where the driver looks for the .ini file by changing the HKEY_LOCAL_ MACHINE\Software\Quest Software\LiteSpeedEngine\IniPath registry key and refreshing the driver configuration on each node. If this shared UNC path is not available for some reason when the node starts and

the driver is initialized, select **File | Driver management | Refresh driver configuration** from that node's LiteSpeed Engine Configuration editor or run the UpdateDriver.exe.

Refresh the Driver Using UpdateDriver.exe

Thy UpdateDriver.exe utility allows you to perform various tasks directly from the command-line interface.

NOTE: The UpdateDriver.exe application must be run by a user that has administrator privileges. If the driver update encounters issues and returns an error message, consult the Windows Event Viewer for detailed error messages.

To perform tasks from the command line

1. Change the directory until you are in the directory containing the UpdateDriver.exe command-line utility (Usually, *C:\Program Files\Quest Software\LiteSpeed\Engine*).

2. Run the utility with appropriate arguments.

Arguments

NOTES:

- Single-letter arguments are case-sensitive, and they can be preceded by '-' or '/'.

- Verbose multi-letter arguments are not case-sensitive, they must be preceded by double dashes '--'.

-Argument	--Argument	Description
?	Help	Displays syntax and accepted arguments.
c	ClearLog	Clears tracing log.
d	Disable	Stops the engine.
e	Enable	Starts the engine.
r	Rescan	Rescans for new drives. You may need to rescan the newly added disk devices to be able to do compressed backups to these drives.
s	Status	Displays driver status.
u	Update	Refreshes driver configuration. For more information, see Manage Configuration Files on page 13.

Examples

Refresh driver configuration

UpdateDriver.exe --Update

Rescan for new drives

UpdateDriver.exe -r

Configure Application Options

To configure LiteSpeed Engine options

1. Select **Tools | Options**.

2. Set application options. Review the following for additional information:

Option	Description
New extension defaults	Default compression and encryption levels used when creating new file extension entries.
Available extensions	The file extensions in this list will be visible in the extension drop-down list in the Add Configuration Option window. **NOTE:** New file extensions may be added dynamically when adding custom extensions using the **Edit	Add Extension** option.
Application	You can edit the following application behaviors in the Application section: • **Ask to save on exit** (enabled by default)—When this option is enabled, if you have added or edited file extension settings you will be prompted to save the configuration upon exiting the application. • **Update driver on save** (enabled by default)—When this option is enabled, if you have added or edited file extension settings the driver will be updated when the configuration is saved. • **Reset form layout**—This option will reset the application form window, along with the column order and size, to their defaults. When this option is employed, it clears any changes you may have made to the application form and its columns immediately after you click Ok.

Troubleshooting

Review the following to help you troubleshoot different problems:

- Can't backup a file
- Can't restore a file
- Backups are no longer compressed
- Backup performance seems slow

Can't backup a file

- If you are creating an encrypted appended backup file, LiteSpeed Engine needs the backup file's restore password when performing a backup. SQL Server needs to re-read a portion of the previous backup before appending the new backup, making it necessary for LiteSpeed Engine to decrypt this information. To save the restore password to the LiteSpeed Engine configuration, edit the file extension setting using the LiteSpeed Engine Configuration editor.

- LiteSpeed Engine only supports the use of encryption with appended backups if the user includes the restore password in the configuration file.

- LiteSpeed Engine does not support the changing of passwords for an appended backup file.

- LiteSpeed Engine does not support the back up of encrypted and unencrypted backups in the same file.

Can't restore a file

Ensure that the driver is installed and running. To verify the installation and version information, select **File | Driver management | Driver status...** or enter to following command at the command prompt:

```
c:\>  sc qdescription lsbackfilter
```

- If you are using encryption, ensure that you have the correct encryption password or that the password has not been changed. LiteSpeed Engine does not maintain password history. You will need to either reconfigure the associated backup extension with the correct password. Alternately, rename the backup

using a new extension which is then assigned the correct restore password.

- LiteSpeed Engine does not support the changing of passwords for an appended backup file.
- Ensure that the directory where the backup file resides has the appropriate read/write access. If the .lsi file associated with the backup is unavailable, LiteSpeed Engine will attempt to rebuild it.

Backups are no longer compressed

- Ensure that you have a valid license. Select the **Help | License**.
- Ensure that your license has not expired. If the license has expired the Windows Event Log will contain an LiteSpeed Engine entry indicating that the license has expired. You can quickly retrieve LiteSpeed Engine related Event Log entries by selecting **Help | Support Bundle** and clicking **View log**.
- Ensure the driver was updated to pick up the changes you made to the configuration file. Select **File | Driver management | Refresh driver configuration**.
- Ensure the disk you want to backup to is available. When a cluster drive failed over or a usb drive was added, you can manually rescan the disk devices to be able to do compressed backups to these drives. Select **File | Driver management | Rescan for new drives**.

Backup performance seems slow

- Because LiteSpeed Engine CPU usage is higher at compression level 2 and higher, you may be CPU bound. LiteSpeed Engine takes advantage of more CPUs when backups are striped. If your backup targets to a single file, try striping the backup file to two or more files.

Use Driver Tracing

The driver tracing feature is a troubleshooting tool that is generally used by Quest Software Support to gather and send information to the software development team. If you are instructed by Quest Software Support to enable driver tracing the following will help you to configure tracing, as well as view the trace file.

To enable driver tracing

1. Select **File | Driver management | Configure tracing**.
2. Select the **Tracing Enabled** checkbox and complete the dialog.

Similarly, to disable tracing, clear the **Tracing Enabled** checkbox.

To view the driver trace log

Use the **File | Driver management | View driver tracing** option.

Create Support Bundles

A Support Bundle is a collection of system information. Quest Software Technical Support may ask you to generate a Support Bundle and send it to them to help troubleshoot product issues.

To create a support bundle

Select **Help | Support Bundle**.

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/company/contact-us.aspx or call +1 949 754-8000.

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 some third-party components (listed below). Copies of their licenses may be found at referencing http://www.quest.com/legal/license-agreements.aspx. Source code for components marked with an asterisk (*) is available at http://opensource.quest.com.

Table 1: List of Third-Party Contributions

Component	License or Acknowledgement
LibTomCrypt 1.17	LibTomCrypt 1.17 license
LZMA 4.65	Public Domain
QuickLZ 1.4	QuickLZ Commercial License 1.0
SharpZipLib 0.85.5.452	SharpZipLib License
zlib 1.2.3	zlib License

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