

# LiteSpeed<sup>®</sup> for SQL Server<sup>®</sup> 8.7.1

## Release Notes

February 2019

These release notes provide information about the LiteSpeed for SQL Server release.

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## About this release

LiteSpeed for SQL Server, or LiteSpeed, is a fast and flexible backup and recovery solution that allows DBAs to easily maintain complete control over the backup and recovery process. Its low-impact, high-performance compression and encryption technology enables users to reduce storage costs and protect data, while improving both backup and disaster recovery times. With the improved compression and LiteSpeed's Fast Compression technology, LiteSpeed for SQL Server can further reduce disk space and backup time up to another 85% over traditional, compressed full backup solutions. The result is a unique backup and recovery approach, unmatched in flexibility, that greatly reduces backup times, creates a significantly smaller storage footprint, and maintains a high level of recoverability.

- LiteSpeed 8.7.1 is a patch release,

- with no new functionality. See [Resolved issues](#).

## Key Benefits

- Store database backups directly into the following cloud platforms: Microsoft Azure Blob storage, Amazon S3 and Google Storage.
- Reduce storage requirements to save valuable disk space with Fast Compression (reduce storage and improve backup times up to 85% over traditional full backup solutions)
- Optimize use of available server resources with LiteSpeed's Adaptive Compression
- Reduce backup times to improve maintenance windows
- Reduce restore times to avoid excessive downtime
- Automate backup testing and running database consistency checks using Automated Restore
- Easily configure backup jobs and maintenance plans on multiple instances by deploying LiteSpeed Backup Templates
- Easily configure and monitor Log Shipping using the Create LiteSpeed Log Shipping Plan Wizard and Monitoring tab in the LiteSpeed UI Console
- Recover data and schema from backups using LiteSpeed's Object Level Recovery
- Undo critical transactions using LiteSpeed's Transaction Log Reader
- View backup performance across the enterprise using LiteSpeed's centralized reporting repository
- Easily manage SQL Agent jobs across multiple servers using LiteSpeed's Job Manager
- Easily configure maintenance plans across the enterprise using LiteSpeed's Maintenance Plan Designer
- Leverage LiteSpeed's advanced engine tuning, including CPU Affinity, CPU Throttling, and Threading options
- Analyze your environment for best backup performance and identify bottlenecks using LiteSpeed's Backup Analyzer
- Eight highly optimized levels of compression
- Secure data using backup encryption up to AES-256

## New features

New features in LiteSpeed 8.7:

- Google Cloud Storage - LiteSpeed now supports Google Cloud Storage as a target for backups.
- MS AES encryption - LiteSpeed now supports the FIPS 140-2 compliant Microsoft AES encryption (128, 192 and 256) algorithms.

See also:

- [Enhancements](#)
- [Resolved issues](#)

## Enhancements

The following is a list of enhancements implemented in LiteSpeed 8.7.

**Table 1: General enhancements**

Enhancement	Issue ID
Double Click Restore DCR - LiteSpeed now creates a loader for the DCR by default. Use @doubleclick=1 to override this.	LS-799
LiteSpeed now supports Azure SQL service as central repository.	LS-634
TDE compression - LiteSpeed now supports TDE compression on SQL Server 2016 SP2.	LS-629
Object Level Recovery - LiteSpeed now has a solution to customers wanting table level recovery to point in time.	LS-627
The Customer License Number is now visible in the License dialog in the User Interface or by SQL command: EXEC master.dbo.xp_sqlitespeed_licenseinfo @ShowLicenseNumber = 1	LS-614
Automated Restore - LiteSpeed now supports @with = N'keep_cdc'	LS-555
Install - LiteSpeed now automatically selects the highest Provider version during LiteSpeed installation. Later Providers include implementations of newer protocols like TLS.	LS-522 LS-844
Fast Compression - LiteSpeed can now search multiple custom folder paths for backups.	LS-363.
Log Shipping - LiteSpeed now supports several subscribers on ONE server for ONE publisher.	LS-109
Backup Template - LiteSpeed now allows you to optionally enter the owner of the SQL job that will deploy the Backup Template.	LS-44

## Deprecated features

The following is a list of features that are no longer supported starting with LiteSpeed 8.7.

- LiteSpeed Engine for SQL Server is no longer included in LiteSpeed

## Resolved Issues

### In LiteSpeed 8.7.1

The following is a list of issues addressed in release 8.7.1

**Table 2: Core issues**

Resolved Issue	Issue ID
Corrected a problem where Log shipping calls to check memory should not crash server or consume up server resources.	LS-1127
Corrected a problem behind a Delete File error on backup to Google Storage for files containing special symbols, slashes or spaces including files in subfolders.	LS-1320
With tlog backups, changed the default setting for the option "Optimize Object Level Recovery speed" to off as in some cases there is more difficulty with its usage than profit.	LS-1222
Corrected a display problem, when a backup or restore verify ran for a longer period of time it showed up in the console as failed but was still running in the background.	LS-1027
Litepseed now sets maximum striping/CloudPartSize values for backups to cloud databases that cannot be read.	LS-1262
The LiteSpeed activity page now records successful and failed fast compression backups.	LS-1220
Fast Compression now shows all messages in the logs, not just messages from the last database.	LS-1218
Fast Compression backups no longer backup databases in STANDBY mode.	LS-1236
OLR is now able to execute requests to process more than 200 TLOG backups.	LS-1030 CSR 4369943
LiteSpeed now locks backup files during regular backup full / differential / TLOG / fast compression.	LS-1194
LiteSpeed now includes logging and retries into the CloudProxy where it checks for bucket existence and requests a bucket's region.	LS-1161

## In LiteSpeed 8.7

The following is a list of issues addressed in release 8.7

**Table 3: Core issues**

Resolved Issue	Issue ID
The Instance configuration wizard now allows you to edit the instance name at the SQL Instances step. Ctrl+Left Click on an empty place near the "use the same login ..." check box.	LS-552
When the console is setup to use "central" view, refresh now correctly updates the list of registered SQL Servers.	LS-570
Automated restore now reports the correct message for a dropped database..	LS-576
The Database tab at the instance level now shows the last backup for all databases.	LS-580
LiteSpeed Core is now able to correctly read files with non-standard sector sizes from storage.	LS-643
LiteSpeed now handles license information from old license types (License types used by LiteSpeed versions prior to 8.6).	LS-646 LS-647

Resolved Issue	Issue ID
	LS-649
	LS-780
Instance configuration now allows the SQL name to include a port number.	LS-656
Multi-database Fast Compression now correctly works with the %DATABASENAME% parameter.	LS-708
Maintenance Plans can now run backups without an additional call to xp_restore_headeronly	LS-721
On upgrade LiteSpeed is now able to correctly handle the old license type (License types used by LiteSpeed versions prior to 8.6).	LS-780
Corrected an issue where Automated Restore ran with no results.	LS-819
Symbol "]" is now allowed in the database name in backup Maintenance Plans.	LS-823
Symbol "{" is now allowed in OLR scripts..	LS-845
"Always on availability group" options are now disabled when "System Databases" is selected in Maintenance Plans.	LS-854
Remote Deploy now supports TLS 1.2 automated provider selection.	LS-855
Backup Template jobs now produce an error when the backup path option is selected and not used.	LS-871
LiteSpeed Core now works correctly on receipt of unexpected errors from the SQL Server.	LS-890
Browsing for a backup location on windows 2016 no longer results the error "Arithmetic operation resulted in an overflow."	LS-904
The LiteSpeed Console now reports the server as registered when the native Log Shipping plan includes a server port number in "name".	LS-186
The Log Shipping wizard now uses the port number of a registered SQL Server instance.	LS-897
Fast Compression smart cleanup tasks are now able to delete files in the case of locked files.	LS-903
	LS-820

## In LiteSpeed 8.6.1

The following is a list of issues addressed in release 8.6.1.

**Table 4: Core issues**

Resolved Issue	Issue ID
Handling of the error "The process cannot access the file because it is being used by another process" in maintenance plans has been improved.	LS-721
Fast Compression backup for multiple databases now supports the %DATABASENAME% variable.	LS-708
LiteSpeed core work with different drive sector sizes has been improved.	LS-643, LS-649

Resolved Issue	Issue ID
Smart cleanup is able to work with a larger number of files now.	LS-644
License verification is now optimized for old format keys (prior to version 8.6).	LS-646, LS-647
The Instance Configuration Wizard now allows you to set a port number for SQL Server instances on non-standard ports.	LS-656

## In LiteSpeed 8.6.0

The following is a list of issues addressed in release 8.6.0.

**Table 5: Core issues**

Resolved Issue	Issue ID
Errors "Database 'name' is invalid: not found" may occur during smart cleanup process on fast computers	LS-293
Cloud buckets browsing may fail with error "List of Objects in cloud exception: The remote server returned an error: (404) Not Found" in case of a lot of cloud objects	LS-369
Automated restore does not show error in case of drop database operation fail	LS-207
Automated restore may fail drop database if the database is in use by other connection	LS-214
Backups executed with depreciating @LSECompatible=1 parameter can't be restored.	LS-323
Backup performance slow due to the running of unneeded T SQL statement.	LS-384
Automated restore changes file names and extension for secondary data files	LS-483
Backup of AG secondary replica fails if the replica is not set to be readable.	LS-498

**Table 6: Log Reader issues**

Resolved Issue	Issue ID
Log reader may fail when reading large log files because it could not use all available RAM on the machine	LS-6

**Table 7: OLR issues**

Resolved Issue	Issue ID
OLR should support sparse columns	LS-258

**Table 8: Job Manager issues**

Resolved Issue	Issue ID
Job Manager may raise an error in case of adding job step to a job.	LS-446

**Table 9: Backup Template issues**

<b>Resolved Issue</b>	<b>Issue ID</b>
Template deployment may move registered instances to the "unregistered instances" category	LS-448

**Table 10: Console issues**

<b>Resolved Issue</b>	<b>Issue ID</b>
The user interface console displays an incorrect message if the central repository instance is setup with a port number	LS-503

**Table 11: Maintenance Plan issues**

<b>Resolved Issue</b>	<b>Issue ID</b>
Maintenance plans create but do not drop temp tables.	LS-516
Maintenance plans may fail with error "Access violation at address 00511475 in module 'slssqlmaint.exe'. Read of address 7FFD5DF6" during fast compression with smart cleanup plan execution in some cases.	LS-521

## In LiteSpeed 8.5

The following is a list of issues addressed in release 8.5.

**Table 12: Backup and Restore resolved issues**

<b>Resolved Issue</b>	<b>Issue ID</b>
Performance issue related to mirrored backups resolved	115926
Issue with hanging backups on high load systems resolved	119546 119800
LiteSpeed install on windows 2012/2016 servers does not need NET 3.5 any more	119868
"Provider" parameter added to LS Core ini file	119658

**Table 13: Fast Compression resolved issues**

<b>Resolved Issue</b>	<b>Issue ID</b>
Number of threads from LiteSpeed defaults correctly applied in Fast Compression	119711
Escalation events do not raise error status for backup	119780
Fast Compression can figure out special cases caused by SmartCleanup	119735

**Table 14: Remote Deploy resolved issues**

Resolved Issue	Issue ID
Remote deploy wizard opens normally on all systems	119799

**Table 15: OLR resolved issues**

Resolved Issue	Issue ID
Filtered Index is supported	119598
NTEXT,TEXT, IMAGE types can be restored via Direct Mode	119724

**Table 16: Maintenance plans resolved issues**

Resolved Issue	Issue ID
Maintenance plan reports can be emailed in all cases	119476
Striped backups can be deleted from cloud with “delete files older then” option	119689

**Table 17: Instance Configuration Wizard resolved issues**

Resolved Issue	Issue ID
AlwaysOn Group listener can be used for the central repository connection	119600 119596

## Known Issues

The following is a list of issues, including those attributed to third-party products, known to exist at the time of release.

**Table 18: Version compatibility known issues**

Known Issue	Issue ID
Database backups created with LiteSpeed Version 8.x cannot be restored using older versions of LiteSpeed. However, backups created with previous versions of LiteSpeed can be restored with LiteSpeed 8.2.	N/A

**Table 19: Console known issues**

Known Issue	Issue ID
On Windows 8.1, console logging cannot be enabled when UAC is enabled. The workaround is to run LiteSpeed with the “Run as Administrator” option to enable console logging.	113540



**Table 20: Backup and restore known issues**

Known Issue	Issue ID
Mirroring is not supported for TSM backups.	49305
LiteSpeed incorrectly writes successful backup details to the SQL Server error log or event viewer if DBCC TRACEON (3226) is run with the backup. These details are not written for a native backup.	38972
On using LiteSpeed Automated Restore to restore an old backup to the source database, automated restore chooses older backups with a higher LSN number in preference to newer backups created after the restore. Workaround: Remove all the backups from old the database (created before the restore) from the backup folders scanned by Automated Restore.	LS-514

**Table 21: Activity logging known issues**

Known Issue	Issue ID
NT AUTHORITY\SYSTEM account must be added to the sysadmin server role on the local instances of SQL Server 2012 or higher in this very rare scenario: <ul style="list-style-type: none"> <li>The central repository is on the same server as the Local repository and</li> <li>You selected <b>Local System</b> on the Service Account wizard page of the Instance Configuration Wizard and</li> <li>You selected to use Windows authentication for the repositories.</li> </ul> <p>Otherwise, the local instance will not report to the central repository. <b>Workaround:</b> Instead of adding NT AUTHORITY\SYSTEM account to the sysadmin server role, you can either provide a Windows domain account on the Service Account wizard page or use SQL Server Authentication for the local and central repositories.</p>	104669

**Table 22: Backup Analyzer known issues**

Known Issue	Issue ID
The LiteSpeed Backup Analyzer backs up the requested amount of data for analysis and then automatically aborts the backup process. This generates VDI error messages in the LiteSpeed SQL Server error log. Please ignore them.	79697

**Table 23: Log shipping known issues**

Known Issue	Issue ID
The publisher and subscriber servers must have the same version of LiteSpeed.	52230
In the native SQL Server 2000 log shipping plans, if the monitoring server is not the same as the subscriber server, information about the restore time is based on the restore job history and may be different from the actual restore time.	98644

**Table 24: Maintenance plans known issues**

Known Issue	Issue ID
Legacy native plans on SQL Server 2008 may fail due to Microsoft backward compatibility issue. See <a href="http://support.microsoft.com/kb/955626">http://support.microsoft.com/kb/955626</a> .	60281
LiteSpeed does not support regular expressions with the IgnoreCase option. To ignore case, use ([Aa][Bb][Cc]) instead of (?i:abc).	94513

**Table 25: Log Reader known issues**

Known Issue	Issue ID
User information displays only for operations in sessions that are currently active. The online log and backups do not contain user information and only contain the SPID for the transaction.	37112
Log Reader does not support row-level and page-level compression.	N/A

**Table 26: Object Level Recovery known issues**

Known Issue	Issue ID
Restore of a table with default values after adding a NOT NULL column to the existing table will result in an error in the case of using Direct Mode (the issue is related to SQL Server 2012 and higher). Workaround: use Bulk Insert recovery mode.	119733
If there is data of variant type with size > 7991 in the table data, recovery using Bulk Insert will result in a BCP internal error: " The column is too long in the data file for...". Workaround: use Direct Mode for data recovery.	119732

# System Requirements

Before installing LiteSpeed 8.7.1, ensure that your system meets the following minimum hardware and software requirements.

## Hardware Requirements

**Table 27: List of hardware requirements**

Requirements	Details
Processor	Follow the recommendations for the SQL Server version used.
Disk Space	250 MB of disk space for installation <b>NOTE:</b> The disk space required may vary based on options selected during installation.
Memory	Follow the recommendations for the SQL Server version used. <b>NOTE:</b> The memory required may vary based on the following:

Requirements	Details
	<ul style="list-style-type: none"> <li>• Applications that are running on your system</li> <li>• Size and complexity of the database</li> <li>• Amount of database activity</li> <li>• Number of concurrent users accessing the database</li> </ul>
Monitor	SVGA with a minimum resolution of 1024x768

## Software Requirements

**Table 28: List of software requirements**

Requirements	Details
Operating System	<p>Microsoft Windows Server 2008 32-bit and 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows Server 2008 R2 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows Server 2012 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows Server 2012 R2 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows Server 2016 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows XP 32-bit and 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows Vista 32-bit and 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows 7 32-bit and 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows 8 32-bit and 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows 8.1 32-bit and 64-bit (x64) (All Service Packs)</p> <p>Microsoft Windows 10 32-bit and 64-bit (x64) (All Service Packs)</p>
Database Software	<p>SQL Server 2005 32-bit and 64-bit (x64) (All Service Packs)</p> <p>SQL Server 2008 32-bit and 64-bit (x64) (All Service Packs)</p> <p>SQL Server 2008 R2 32-bit and 64-bit (x64) (All Service Packs)</p> <p>SQL Server 2012 32-bit and 64-bit (x64) (All Service Packs)</p> <p>SQL Server 2014 32-bit and 64-bit (x64) (All Service Packs)</p> <p>SQL Server 2016 64-bit (x64) (All Service Packs)</p> <p>SQL Server 2017 64-bit (x64) (All Service Packs) when hosted on a Windows operating system.</p>
Additional Software	<p>.Net Framework 4.5 installed before you install the LiteSpeed UI Console and LiteSpeed Core Cloud Components.</p> <p>.Net Framework 3.5 required with SQL Server 2005, 2008 and 2008R2.</p> <p>If using Tivoli Storage Manager (TSM), the TSM API and Backup/Archive Client version 5.3 or later should be installed.</p> <p>Microsoft Internet Explorer 6.0 or later.</p> <p>Adobe Reader 8 or later to view PDF guides.</p>

## Supported Cluster Requirements

- Windows Server 2008 Failover Cluster
- Windows Server 2008 R2 Failover Cluster
- Windows Server 2012 Failover Cluster
- Windows Server 2012 R2 Failover Cluster
- Windows Server 2016 Failover Cluster
- HP PolyServe Matrix Sever 3.6.1
- Veritas Storage Foundation HA for Windows 5.0

## Supported Deduplication Storage Appliances

LiteSpeed has been tested on Dell DR, EMC Data Domain, and ExaGrid storage appliances.

## VMware and Hyper-V Environments

LiteSpeed has been tested and is certified to work under VMware and Hyper-V environments.

## Upgrade and Compatibility

For information about registering LiteSpeed and for upgrade instructions, please see the *LiteSpeed Installation Guide*.

Note that from LiteSpeed 8.5 the default install file path has changed. On upgrade the install file path will not change automatically. You can change the file path during the upgrade process: Browse "Folder name".

## Repository Compatibility

If receiving the message "The version of the <RepositoryDatabaseName> on server <ServerName> is greater than the version of this release of LiteSpeed for SQL Server", please see the online Help topic "Upgrade Repositories". The message is an indication that the statistics agent on the older server does not match the newer version of LiteSpeed and must be upgraded.

In addition, there are special considerations if you are upgrading from LiteSpeed 4.x. Review the following before upgrading from LiteSpeed 4.x to LiteSpeed 5.0 or later.

## Maintenance Plans

LiteSpeed 5.x and later do not support SSMS plug-in functionality. However, the LiteSpeed UI Console allows you to read SSMS plug-in maintenance plans and upgrade them to SSIS LiteSpeed maintenance plans.

There are two ways to remove old backup files for maintenance plans: the 'Clean up maintenance plans' task and the 'Remove files older than' option in the 'Back Up Database' task. The 'Remove files older than' option removes both LiteSpeed 4.8 and LiteSpeed 5.x/6.x backup files for legacy plans. However, for SSIS

maintenance plans it only removes LiteSpeed 5.x/6.x backup files. The 'Clean up maintenance plans' task removes LiteSpeed 4.8 and LiteSpeed 5.x/6.x backup files.

## Log Shipping

The SQL Server versions supported for log shipping depend upon the LiteSpeed release:

SQL Server	4.8	5.0	5.0.1	5.0.2	5.1.0-6.5.1	6.5.2	7.x	8.0-8.6.0	8.6.1-8.7
2005	•	•		•	•	•	•	•	•
2008 / R2		•	•	•	•	•	•	•	•
2012						•	•	•	•
2014							•	•	•
2016								•	•
2017									•

## Product licensing

### For existing customers:

- If you purchased LiteSpeed and received your new license, enter the License Key and Site Message value during the installation or register LiteSpeed later.
- If you purchased LiteSpeed but have not received your new LiteSpeed license, please go to <https://support.quest.com/contact-support> and request your upgrade.
- If you have any other licensing questions related to your purchase, please go to <https://support.quest.com/contact-support>.

### For trial customers:

- If you want to purchase LiteSpeed or require a trial extension, please contact your sales representative or open <https://support.quest.com/contact-support>.

## Installation instructions

Double-click on the appropriate installer (.msi file) and follow the on-screen directions.

- LiteSpeed.msi–32-bit installer
- LiteSpeed-x64.msi–64-bit installer

See the LiteSpeed *Installation Guide* for full details on installing LiteSpeed. The *Installation Guide* is located on the product web site and the Quest Support Portal.

Note: It is required that .Net 4.5 is installed before installing LiteSpeed Console and LiteSpeed Core Cloud Components.

## More resources

Additional information is available from the following:

- [Online product documentation](#)
- [Database Performance Monitoring Community](#)

## Globalization

This section contains information about installing and operating this product in non-English configurations, such as those needed by customers outside of North America. This section does not replace the materials about supported platforms and configurations found elsewhere in the product documentation.

This release is Unicode-enabled and supports any character set. It supports simultaneous operation with multilingual data. This release is targeted to support operations in the following regions: North America, Western Europe and Latin America, Central and Eastern Europe, Far-East Asia, Japan.

This release has the following known capabilities or limitations: Note: Litespeed for SQL Server 4.8.4 has been localized in Japanese. 5.0 & more recent releases are English only versions.

# 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](http://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 29: List of Third-Party Contributions**

Component	License or acknowledgement
AWS SDK for .NET 3.3.8	<p>AWS SDK for .NET            Copyright 2009-2017 Amazon.com, Inc. or its affiliates. All Rights Reserved.            *****</p> <p>THIRD PARTY COMPONENTS            *****</p> <p>This software includes third party software subject to the following copyrights:            -Json processing from LitJson -            All the source code and related files distributed with this software have been dedicated to the public domain by the authors.            Anyone is free to copy, modify, publish, use, compile, sell, or distribute the software, either in source code form or as a compiled binary, for any purpose, commercial or non-commercial, and by any means.            - Parsing PEM files from Bouncy Castle -            Copyright (c) 2000 - 2011 The Legion Of The Bouncy Castle            (<a href="http://www.bouncycastle.org">http://www.bouncycastle.org</a>)            Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:            The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.            THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.            - Performing CRC32 checks from vbAccelerator.com            vbAccelerator Software License            Version 1.0            Copyright (c) 2002 vbAccelerator.com            Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p>



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Version - 8.7.1