



"LiteSpeed is the best product for us because it has the functionality, automation and efficiency that we need, along with flexibility. We have found the restore features of LiteSpeed to be very important. We do daily restores to a reporting database using LiteSpeed, and it takes only 15 minutes to restore around 32 gigabytes of data. Our nightly processing runs much faster than it did before we had LiteSpeed."

—David Holt
Senior Product Manager
Kaye Scholer LLP

LiteSpeed™ for SQL Server

Performance Evaluation

Testing the Effects of Backup Striping, Data Compressibility and Hardware Scaling on Backup and Recovery Performance

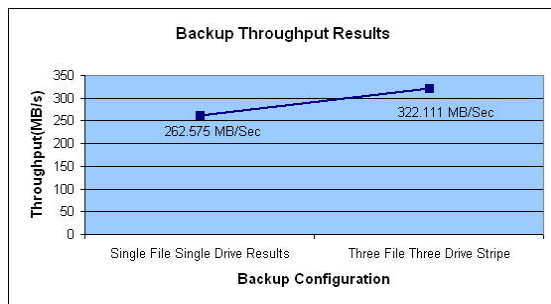
With datasets on SQL Server continuously increasing in size, database professionals need effective ways to manage their environment. Part of day-to-day management includes backup and recovery, efficiently managing storage space, and optimizing performance of backup and recovery operations while meeting maintenance windows.

Quest used LiteSpeed™ for SQL Server to demonstrate three factors affecting database backup and recovery performance: the effect of striping a backup across multiple disks, data compressibility (the type of data you are backing up) and scaling hardware.

Striping a Backup

To measure the impact of striping a backup file, tests were conducted backing up a 159 GB database to one file, on a single disk, and a second test spreading the backup file across three files and three disks.

Backup Performance Results



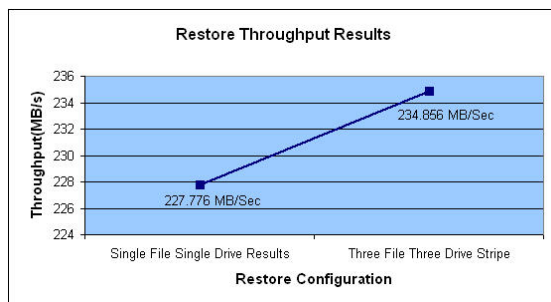
Hardware Configuration:

- 2 x CPU Intel Xeon 3.6 GHz machine
- 159 GB database
- 3 x RAID 0 SATA drives

For both tests, the backup file was compressed 77%. The resulting file size was 35.971 GB. Backup performance increased by more than 18% by striping the file across three drives, from 262 MB/sec to 322 MB/sec on the same server configuration.

The next phase of testing measured the restore performance of the newly created backup files.

Restore Performance Results



Test results show a 7 MB/sec increase by restoring from the striped file.

Conclusion: *Striping the backup file across multiple drives is an easy way to increase the performance of your backup and restore operations, and can save you hours of database downtime when working with large databases.*

Evaluating Backup and Recovery Solutions?

Here are a few tips to help you choose the tool that will provide the highest backup and recovery performance in your environment:

- Determine whether performance test results are based on single file/disk or striped files/disks.
- Make sure you understand the level of compressibility of the data used in performance tests and how it relates to your environment.
- Verify the scalability of your backup and recovery tool.

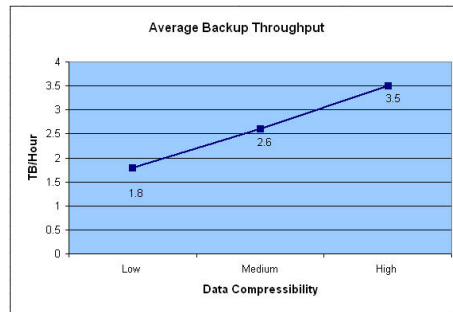
LiteSpeed™ for SQL Server

is the most comprehensive and flexible SQL Server backup and recovery solution available. Offering the widest array of configuration options and featuring a highly scalable architecture, LiteSpeed is essential for environments demanding the highest levels of backup and recovery performance.

Data Compressibility

The next set of tests demonstrates the impact of data compressibility on the performance of a backup using a file compression tool. Using LiteSpeed, we conducted backup tests against three data compressibility types: Low (2.6:1), Medium (5:1) and High (10:1). By running these tests against the same size database, and on the same hardware, we were able to assess the impact that data compressibility has on backup performance.

Compressibility Performance Results



Hardware Configuration:

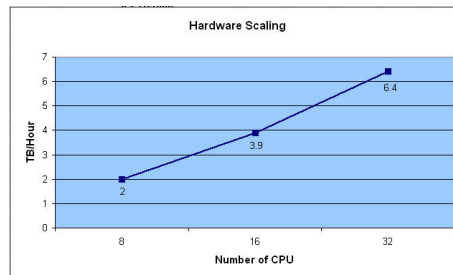
- 4 x CPU 3.6 GHz Xeon
- 3 Dual Channel SCSI controllers
- 24 x 73 GB 10k RPM disks

Conclusion: *The more compressible the data, the greater the backup throughput you can expect. You should consider data compressibility whenever evaluating the performance of your backup process using a compression tool, as it has a direct correlation to the results you will see.*

Scaling Hardware

The final set of tests focuses on scalability and the impact that increased processing power has on backup performance. To measure this impact, we performed a series of tests using LiteSpeed and data with low compressibility on the same hardware configuration, while varying the number of processors available to the backup operation.

Scalability Performance Results



Hardware Configuration:

- HP Integrity Superdome
- 49 SmartArray 6402 Dual Channel RAID controllers
- 49 x 18 GB 15k disks

Conclusion: *As datasets continue to grow, so will the server resources required to manage them. It is vital that your backup process be capable of leveraging this added power to keep backup speeds in line with maintenance windows, and allow you to maintain these larger environments with ease. By looking at performance on various hardware configurations, you will have a better idea of how your backup and recovery tool will scale with the growth of your datasets.*

Backup throughput scaled upward as more processing power was made available, from pushing 2 TB an hour with an 8 CPU machine, scaling up to more than 6 TB an hour on a 32 CPU machine.

About Quest Software, Inc.

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