(November 24th, 2014)

If you know someone who you think would benefit from being an Insider, feel free to forward this PDF to them so they can sign up here.

Quick Tips for our Insider friends!

Hey Insiders!

This newsletter is coming to you from Redmond, where we're relaxing after a few strenuous but highly enjoyable weeks at conferences (*Happy Thanksgiving to all our U.S. readers!*). We're really pleased with how well our Fall SQLintersection conference went in Las Vegas, and especially our SQLafterDark trivia night, which we'll definitely be doing at all our future conferences. If you're interested in seeing a few pictures from our Vegas event, check out Kimberly's blog post: SQLintersection Conference and SQLafterDark Evening Event – what a fantastic week in Vegas!

Calling all SQL Server user groups! We're offering to present remotely at any and all SQL Server user groups in 2015, with 25 already on the books. Let your user group leader know about my blog post that explains the details.

2015 classes are open for registration! Our spring 2015 classes in Chicago and Bellevue are open for registrations. All classes have a discount for registering in 2014 (US$125 off IE0 and US$200 off all 5-day classes) so get those training budgets working for you before you lose them at the end of the year!

We're also bringing IEPTO2 to Sydney in February 2015, with big incentives for that and our IEPTO1 in Sydney in December**!** See here for details.

And we're headed back to the UK in 2015, bringing IEPTO1 to London in August, with a US$200 discount for registering in 2014**!** See here for details. And, soon we'll be announcing an IEPTO2 delivery in Dublin in October – stay tuned!

The most recent book I've read is Jack Whyte's *The Forest Laird*. This is an excellent fictionalization of William Wallace's early life. It leads up to the murder of his wife that brought him more fully into the struggle of the Scots against the occupying English forces under King Edward I. The book is very true to Wallace's actual life, and explains his reluctance to enter all-out war. In comparison, the excellent move Braveheart was actually riddled with historical inaccuracies and much of it was really just fiction. I've been a fan of Whyte's work for 15 years now, and recommend his *Templar Trilogy* and the classic *Camulod Chronicles* series that I re-read back in 2012. Highly recommended.

Please let us know if you liked what you read/saw here and/or have any suggestions for future Quick Tips.

Note: you can get all the prior Insider newsletters here.

Paul's Ponderings

Since the last newsletter I've written a few blog posts you might want to check out:

- Capturing wait statistics for a period of time
- Capturing IO latencies for a period of time
- Bug: Error: 3449 and server restart during DBCC CHECKDB
- Delayed Durability in SQL Server 2014

In the final post in the list above I explain how delayed durability can provide a huge throughput boost to the right workload, but at the expense of possible data loss if a crash occurs. In that post I also predict that a lot of people will choose to enable the feature without considering or mitigating the trade-off being made.

There was a bit of a discussion in the post comments about ways to try to mitigate the potential for data loss, for instance by having a job that regularly calls the new sp_flush_log stored proc once a second, or even having a call to that proc inside an infinite WHILE loop so the log flushes every millisecond or so.

That got me thinking about log flushing configuration and how it would be interesting to have the possibility of controlling how often the log is flushed to allow course-grained performance control.

Implementing that mechanism would be quite challenging though as it would be a wholesale change to the log caching and flushing mechanism, but steps were taken in that direction with the new log cache pool for Availability Groups in SQL Server 2012, where transaction log in the Send Queue (to asynchronous replicas) tries to be cached in memory to prevent reads from the primary replicas on-disk log file.

The feature would be kind of similar to the way we can control how often checkpoints occur using the per-database *TARGET_RECOVERY_TIME* option that was introduced in SQL Server 2012 (called indirect checkpoints) rather than the sledgehammer per-instance recovery time setting.

Both these options control the frequency of checkpoints based on the predicted time to run crash recovery, based on the number of log records generated since the previous checkpoint. The first is in minutes and second is in seconds, which is more desirable. Note that, contrary to popular misconception, neither is a guarantee of an upper limit to the time crash recovery will take as they cannot account for the time necessary to roll back transactions that were uncommitted at the time of the crash.

What's interesting about these two features is that although they seem similar, they're actually providing opposite functionality. Delayed durability is to make log writes happen less frequently so there isn't a constant high write load which overloads the log file I/O subsystem and delays transaction commits, and indirect checkpoints are to make checkpoint writes more frequent, to reduce crash recovery time and also to give a more constant, lower data-file write workload so that a large, periodic checkpoint doesn't overload the data file I/O subsystem. Checkpoints actually monitor the I/O latency for writes and will throttle back when checkpoint write I/O latency hits 20ms.

A perennial problem with high-volume database systems is the CPUs having to wait for the I/O subsystem, which operates at speeds 100-1000x slower than memory. That's why in-memory, non-logged processing is going to become more prevalent for some scenarios over the next few years, but most scenarios will still have to persist data, and log the changes to it.

For all these scenarios, if the amount being logged is the absolute minimum and the log is still an I/O bottleneck, people are going to be tempted to do whatever they can to reduce that latency, and delayed durability seems like the perfect solution.

Call to action: If you're considering using the delayed durability feature in SQL Server 2014, make sure you understand its implications for your disaster recovery strategy and data loss SLA.

I'm curious to hear your thoughts on the knobs around logging and recovery, so please feel free to drop me a line, always treated confidentially, of course.

Video Demo

In this video, Jonathan shows how the implementation of OFFSET/FETCH in SQL Server 2012 simplifies the coding necessary for paging results to a client application.

The video is just under 4 minutes long and you can get:

- In WMV format here
- In MOV format here

You can get the demo code here.

Enjoy!

SQLskills Offerings

We've released our classes for the first half of 2015. We will add courses in the second half of 2015, but 2nd half courses will be limited. Also, please be aware that all US classes have discounts for registering in 2014.

Finally, to help your boss understand the importance of focused, technical training, we've added a few new items to help you justify spending your training dollars with us:

- [Letter to your boss explaining why SQLskills training is worthwhile](#)
- [Community blog posts about our classes](#)
- [Immersion Event FAQ](#)

Upcoming Immersion Events

Sydney, NSW, Australia

- December 8-12, 2014: **IEPTO1**: Immersion Event on Performance Tuning and Optimization – Part 1 (formerly IE1)
- February 23-27, 2015: **IEPTO2**: Immersion Event on Performance Tuning and Optimization – Part 2 (formerly IE2)

Chicago, IL

- April 27-29, 2015: **IE0**: Immersion Event for the Accidental/Junior DBA
- April 27-May 1, 2015: **IEPTO1**: Immersion Event on Performance Tuning and Optimization – Part 1 (formerly IE1)
- May 4-8, 2015: **IEPTO2**: Immersion Event on Performance Tuning and Optimization – Part 2 (formerly IE2)
- May 4-8, 2015: **IEBI**: Immersion Event on Business Intelligence
- May 11-15, 2015: **IEHADR**: Immersion Event on High Availability and Disaster Recovery (formerly IE3)

Bellevue, WA

- June 8-12, 2015: **IEPTO1**: Immersion Event on Performance Tuning and Optimization – Part 1 (formerly IE1)
- June 15-19, 2015: **IEPTO2**: Immersion Event on Performance Tuning and Optimization – Part 2 (formerly IE2)

London, UK

- August 24-28, 2015: **IEPTO1**: Immersion Event on Performance Tuning and Optimization – Part 1 (formerly IE1)

See [here](#) for the main Immersion Event Calendar page that allows you to drill through to each class for more details and registration links.

Summary

We hope you've enjoyed this issue - we really enjoy putting these together.

If there is anything else you're interested in, we'd love to hear from you - [drop us a line](#).

Thanks,
Paul and Kimberly

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