(October 1st, 2012)

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!

Newsletter #42! Life, the universe, and everything! Bonus points if you know where that's from.

This bi-weekly Quick Tips is coming to you from Redmond, where we've made great strides in reorganizing our house and getting rid of clutter we've accumulated over the last few years. I've almost finished recording a very long Pluralsight course all about logging and recovery, and we had two more courses go live last week, on Basic Data Modification and an Introduction to Extended Events – check them out!

We've added an IE4 in London to our 2013 schedule of public classes – see the bottom of the newsletter for all the details.

And in the midst of all this, I've still been reading! The most recent book I've read is Charles Palliser's *The Quincunx*. It's set in the 1800s in England and is the long, complicated story of a boy trying to claim his inheritance in the face of all kinds of betrayals and manipulative relatives. Mostly set in London, the novel is very Dickensian in its style and format, which I really enjoyed. It's full of historical detail and I recommend it to anyone who likes historical fiction.

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

As part of the Pluralsight course I'm working on right now, I wrote a module this morning on recovery and crash recovery, so I thought I'd make that the subject of my ponderings this time.

Crash recovery occurs in parallel, using multiple threads to recover the databases on the instance in database ID order. The number of threads is generally the minimum of the number of databases on the instance (not counting master, model, and tempdb) and the number of processors visible to SQL Server multiplied by four. For example, on a server with 12 databases (not counting master, model, and tempdb), running on a server with 32 processor cores, there will be 12 recovery threads.

Recovery of a database cannot be interrupted, except by shutting down the instance (which is a bit drastic!), which explains why sometimes you cannot interrupt an unexpectedly long-running DBCC CHECKDB. DBCC CHECKDB creates a database snapshot, which has to run crash

recovery on the real database, but into the database snapshot – the real database is unaffected. If there are some long-running transactions at the time when the database snapshot is created, the recovery process may take a long time. If you try to kill the DBCC CHECKDB, you won't be able to – as there is no check in the recovery code to see whether this is crash recovery or recovery of a database snapshot – and you'll need to wait for the database snapshot creation to complete before the DBCC CHECKDB will end.

But I digress. I want to discuss some behavior I've heard about several times from people who shouldn't be allowed anywhere near a SQL Server instance. Several times over the years I've heard of DBAs being annoyed with how long crash recovery of a database has been taking, so they've stopped SQL Server and deleted the transaction log file of the database in question.

Wow! That's about the worst thing you can do to an unrecovered database. The database knows whether crash recovery needs to be run, and if the transaction log file isn't there, the database stays offline in the RECOVERY_PENDING state. The situation is now a lot worse.

There are three ways to get out of this state:

1. Put the deleted transaction log file back and allow crash recovery to complete.
2. Restore from backups.
3. Put the database into EMERGENCY mode and run EMERGENCY-mode repair

Option #1 would be the most preferable here, as it's going to result in zero data loss.

Option #2 is going to result in data loss, unless there's a transaction log backup which happens to have been taken right before the crash occurred. But then, when the restore is completed, recovery is going to have to run! And that's going to take the same amount of time as #1, so this is a worse option, even if there's no data loss.

Option #3 is the absolute worst. By removing the transaction log completely, all knowledge of uncommitted transactions is lost, and so the data is transactionally inconsistent. Also, the database may be structurally inconsistent (i.e. corrupt) depending on what changes were in flight when the crash occurred. This is by far the worst option.

The length of time recovery takes to run needs to be considered during your HA/DR planning as it contributes to the amount of downtime a database will experience during a restore, crash recovery, or a failover. How do you know how long recovery is going to need? Simple, figure out what the longest possible modification transaction that occurs on the database is and then try shutting down the server just before that transaction commits. When the server restarts, you'll be able to time crash recovery and get an idea of whether you're facing seconds, minutes, or hours for crash recovery. And then add a fudge factor (say 25%) to account for all the other redo and undo that may be necessary for other concurrent transactions on your system that will exist on the live server.

If you're aiming for 4-nines on a 24x7 system (approximately 53 minutes of allowable downtime per year), and you have a transaction that may take 20 minutes to roll back if it's caught at the worst point by a crash, that's a significant factor in your HA/DR planning as that 20 minutes might be required for crash recovery, or during a restore, or during a failover.

And don't forget the length of time it takes for the machine itself to boot, go through POST (Power-On-Self-Test), and start Windows Server – if we're talking about crash recovery.

Call to action: Go through the exercise of measuring crash recovery for your longest transaction (or estimating it, if you don't have a server you can simulate a crash on). Also time how long it takes your machine to boot. I think you may be surprised by these times. Now go factor them into your HA/DR plan and see if that changes your strategy any – or makes you aware that your strategy maybe isn't going to meet your downtime projections. And if you're already doing this, well done – you're way ahead of the crowd.

I'm curious to hear your thoughts about crash recovery, so please feel free to drop me a line, treated confidentially of course.

Video Demo

More and more DBAs are utilizing the SQL Server DMVs when they are troubleshooting issues and looking at system performance. However, the data available from Windows Performance Monitor (PerfMon) still provides great value, and remains one of the best ways to look at OS and resource activity. When you're troubleshooting a performance problem, you can open PerfMon and get an immediate view of what's going on in the environment. Of course, you have to add all those OS, resource and SQL Server counters first…or do you? In this Insider video Erin takes you through the steps to configure Performance Monitor to open with a specific set of counters already selected, allowing you to save time later when you really need it. The video is around 6 minutes long and her accompanying blog post is here.

I produced the video in WMV and MOV formats so everyone can watch. You can get the videos:

- For WMV: here
- For MOV: here

No demo code this time.

Enjoy!

SQLskills Offerings

All of our 2013 public classes are now open for registration! Based on requests from people, attendee ratings of the hotels we used this year, and the ease of using hotels we know, we're using the same locations again. This means we cover both sides of the US, central US, and Europe.

Please know that these classes are final as the hotel contracts are signed, and the classes will not be cancelled or moved for any reason, nor will the dates change.

- February 4-8, 2013: Internals and Performance (**IE1**) in Tampa, FL – USA
- February 11-15, 2013: Performance Tuning (**IE2**) in Tampa, FL – USA
- April 29-May 3, 2013: Internals and Performance (**IE1**) in Chicago, IL – USA
- April 29-May 3, 2013: Immersion Event for Business Intelligence (**IEBI**) in Chicago, IL – USA (co-located but in a different training room. Attendance is for one event or the other; these cannot be combined for one attendee where they move back/forth.)
- May 6-10, 2013: Performance Tuning (**IE2**) in Chicago, IL – USA
- May 13-17, 2013: High Availability & Disaster Recovery (**IE3**) in Chicago, IL – USA
- May 13-17, 2013: Immersion Event for Developers (**IEDev**) in Chicago, IL – USA (co-located but in a different training room. Attendance is for one event or the other; these cannot be combined for one attendee where they move back/forth.)
- May 20-24, 2013: Development Support (**IE4**) in Chicago, IL – USA
- June 3-7, 2013: Internals and Performance (**IE1**) in London – UK
- June 10-14, 2013: Performance Tuning (**IE2**) in London – UK
- June 17-21, 2013: High Availability & Disaster Recovery (**IE3**) in London – UK
- June 24-28, 2013: Development Support (**IE4**) in London – UK
- September 16-20, 2013: Internals and Performance (**IE1**) in Bellevue, WA – USA
- September 23-27, 2013: Performance Tuning (**IE2**) in Bellevue, WA – USA

One thing to note is that the course prices have increased slightly for 2013, reflecting increasing food, logistics, travel, and accommodation costs. We kept our prices the same for the last three years but now we have to raise them a little.

For US classes, the new early-bird price is US$3,295 and the full-price is US$3,795. However, for all registrations received before January 1, 2013, and for all past attendees in the 12 months prior to registration, we will only charge the 2012 early bird price of US$2,995 – super-early-bird! – **get your registrations in early!**

For UK classes, the new early-bird price is US$3,795 and the full-price is US$4,295. There is a similar super-early-bird and past-attendee price equal to the 2012 UK early bird price of US$3,495 – **again, get your registrations in early!**

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

So, that's it for now. We hope to see you soon!

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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