

(January 21<sup>st</sup>, 2013)

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, WA where we're making the final preparations for the start of our 2013 class season in Tampa in early February. Our IE1 there is already sold out and there are a couple of spots left for IE2. Check out the full list at the end of the newsletter.

We've just published two new training courses with Pluralsight, Glenn's [SQL Server 2012: Installation and Configuration](#) and Joe's [SQL Server: Troubleshooting Query Plan Quality Issues](#), all about query plan cardinality estimations and the myriad ways they can be messed up.

Pluralsight have actually just announced a free 24-hour pass for anyone on the planet to celebrate their recent investment funding, not credit-card or anything required – check it out [here](#).

The most recent book I've read George Steinmetz's *Empty Quarter*. This is a photographic book detailing Steinmetz's trips to the Empty Quarter of Arabia, through Saudi Arabia, Oman, Yemen, and the United Arab Emirates. He travels around and then flies an ultra-light aircraft, taking stunning aerial photographs. I've been deeply interested in this area of the world since reading Thessiger's *Arabian Sands* and it's on my list of places to see before I die. I have a few more of his similar books about deserts and the African plains and I'm really looking forward to them. Strongly 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**

One of the questions I'm asked frequently is how *TRUNCATE TABLE* and *DROP TABLE* complete so quickly if they're logged operations – surely they're non-logged operations?

No – there are no non-logged operations in user databases, only for certain operations in tempdb (mostly to do with the version store that underlies snapshot isolation, online index operations, DML triggers, and MARS).

Truncate and drop operations are actually fully logged, but very efficiently logged, operations. The only things that are logged for these operations are the deallocations of pages and extents, not individual record deletions.

Back in SQL Server 2000 before SP3, we (as I was on the Storage Engine team at the time) found some customers who literally could not drop or truncate large tables. The operation would fail because of a lack of memory!

The root cause was that it was the cumulative amount of lock memory required by the operation that was causing the operation to fail, and the locks required were part of the allocation system.

The way a data file extent is deallocated from SQL Server 2000 onwards is follows:

- Acquire an exclusive extent lock (a lock only respected by the allocation system in the Storage Engine).
- Perform a lock ‘probe’ of each of the eight pages in the extent (i.e. perform an acquire-exclusive-lock-and-immediately-release-it operation).
- If all eight pages locks can be probed successfully, mark the extent deallocated.

The problem is that the extent X lock needs to be held until the end of the transaction, otherwise another thread could allocate and use the extent, making rollback of the drop or truncate very problematic. The more extents there are, the more X locks there are, and the more lock memory is used. With a large enough table trying to be dropped/truncated in one go, back in the SQL Server 2000 days it was possible to run out of memory and the operation would fail.

In SQL Server 2000 SP3 we introduced the deferred drop mechanism. This works by unhooking the allocations for a table and placing them on the deferred drop queue. A background task then does the deallocation process in relatively small batches, ensuring that there is no possibility of running out of lock memory and the operation failing.

The upshot of this is that a drop or truncate of a large table will complete immediately now – as the only operation being performed at the time of the drop or truncate is the manipulation of allocation metadata. This also explains why a drop or truncate appears to be non-logged. The transaction that does the allocation metadata manipulation doesn’t generate many log records. If you wait a few minutes and look in the log again though, you’ll see thousands of log records – each deallocating an extent. That’s the deferred drop background task at work.

This [blog post](#) I wrote in 2010 shows the log records generated by a deferred drop operation, plus the initial *TRUNCATE TABLE*.

**Call to action:** This week’s call is just for you to think about what has to change in a database to accomplish an operation. When thinking about this for a table truncation it’s easy to see how a whole table’s worth of data file pages can’t just be deallocated without any record of that being logged somewhere to allow a proper crash recovery to work. The bottom line is that SQL Server has to guarantee a consistent database after a crash, which implies that everything has to be logged to some degree in a user database.

I'm curious to hear your thoughts about deferred-drop and the efficient logging of operations, so please feel free to [drop me a line](#), treated confidentially of course.

## **Video Demo**

From Erin Stellato:

A new statistics DMF, sys.dm\_db\_stats\_properties, is now available in SQL Server, and if you look at statistics, this is a DMF you want to get to know. In this Insider Video we'll examine the traditional method of looking at basic statistics information using DBCC SHOW\_STATISTICS compared against using sys.dm\_db\_stats\_properties to view the same information, and more. You'll see how easy it is to now capture basic information for all statistics for a table or database, and you'll get a glimpse into the new data exposed by the DMF: modifications.

The video is 8.5 minutes long and you can get it:

- In WMV format [here](#)
- In MOV format [here](#)

You can get a zip of the demo code [here](#).

Additional reading:

- [New Statistics DMF in SQL Server 2008R2 SP2](#)
- [Understanding When Statistics Will Automatically Update](#)

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 last 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. We are not planning any other locations for 2013.

- 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 past attendees in the 12 months prior to registration, we will only charge the 2012 early bird price of US\$2,995. As an alumnus, send us an email prior to registering and we'll give you a code to use to access this special rate. And **be sure to 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 past-attendee price equal to the 2012 UK early bird price of US\$3,495. **Again, be sure to 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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