

(June 19th, 2017)

If you know someone who 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,

As this hits your inboxes we've just arrived home from Dublin where we did our first ever SQLSaturday! We love the SQL Server community in Ireland and our good friends Bob Duffy and Carmel Gunn put on a really great event – it was a huge amount of fun!

Please note that there won't be a newsletter on July 3rd – the next one will be on July 17th.

Note: you can get all the prior Insider newsletters [here](#).

SQLskills News

We've released our **October line-up of classes in Chicago**, including IE0, IEPTO1, IEPTO2, IEPDS, IESSIS1, plus THREE new courses. We're debuting a [new two-day class on Azure SQL Database and Azure VMs](#), a [new three-day class on Upgrading SQL Server](#), and a [new two-day class on Clustering and Availability Groups](#). See [here](#) for the complete 2017 SQLskills Immersion Event class schedule.

Erin will be presenting a workshop at this year's [PASS Summit](#) in Seattle on October 30th, titled *Solving Common Performance Problems Using Query Store*. Check out the details [here](#).

We've started a new initiative where we're all blogging about introductory topics, to help the burgeoning numbers of non-DBAs or junior DBAs who are responsible for SQL Server instances. We're calling it SQL101, and hopefully it'll even help refresh or reinforce topics for the more seasoned DBAs in the community. The blog posts will be automatically collected [here](#).

Finally, even if you can't join us in person, we're still taking requests for remote user group sessions for this year. We have over 70 scheduled so far; if you'd like one of us to present for your user group, check out my blog post [here](#).

Book Review

I haven't finished any books since the last newsletter, so I'm going to tell you about Peter Hopkirk's [Trespassers on the Roof of the World: The Secret Exploration of Tibet](#) that I read in 2013. This is an excellent set of stories about the first non-Tibetans trying to reach Lhasa, the capital of Tibet, and one of the top three on my list of places to go before I die. Mostly dealing with those engaged in The Great Game in the nineteenth century (the struggle for supremacy in

Central and Southern Asia between Britain and Russia), the book shows the lengths and harrowing hardships people went to while striving to reach the forbidden capital of Tibet. Although the Chinese ended up annexing the country completely, the book shows that the British were almost as shameful in their treatment of Tibet back then. Highly recommended.

The Curious Case of...

This section of the newsletter explains problems we've found on client systems; they might be something you're experiencing too.

I got an email question last week from someone who had experienced a strange situation around corruption and asked if I could explain it. Selecting from a table would result in a severe error and a crash dump being created, as would running any other command that touched the table. However, running a *DBCC CHECKDB* completed without any errors, and rebooting the server made the problem go away.

The explanation is that there was memory corruption – the table and/or its metadata were corrupt in memory but not on disk. The proof of this is that *DBCC CHECKDB* creates a database snapshot under the covers and then runs the consistency checks against the snapshot, forcing all pages to be read from disk into the buffer pool (I explained why this is necessary in the [May 22nd newsletter](#)). When the pages were read from disk, there was no corruption, so the corruption must only have affected the in-memory copies of the pages from the database.

Bottom line: memory corruption can happen, mostly from bad memory chips, but occasionally from SQL Server bugs or another process scribbling on SQL Server's buffer pool (this is very rare). If you suspect something like this, run complete memory diagnostics on the host server.

Paul's Ponderings

You may have heard about the case of Verelox last week, a Dutch hosting company that was nearly destroyed by a disgruntled ex-administrator who was able to wipe their servers clean (details here on [BleepingComputer](#)). It looks like the administrator was still able to access his/her account after leaving the company.

If this was the case, that's inexcusable laxity on their part as far as I'm concerned. In today's world, where black-hat hackers from across the world are constantly trying to penetrate the I.T. infrastructure of companies, keeping on top of potential security problems is vital. No former employee should still have an active account, especially not one with administrator privileges!

And of course the same goes for the SQL Server infrastructure at your company.

Any time a security scare happens, it's a good reminder that SQL Server has security considerations that need to be addressed. Here's a list of things you need to consider:

- Physical security of your servers (can someone walk away with a server or storage?)
- Network security (Windows security, firewalls, encryption, Kerberos, using SQL Browser)
- Attack surface minimization (disabling unused features so they're not available for hackers to attempt to subvert)
- Service accounts (using accounts with the least privileges possible to reduce the likelihood that a compromised account can lead to a wholesale network penetration)
- Restricting use of admin privileges (only those people who *really* need admin rights should have them)
- Authentication mode (whether to allow SQL Server authentication as well as or in place of Windows authentication)
- Authorization (using the principle of least privilege to prevent unnecessary access to data and functionality)
- SQL injection (making sure that dynamic SQL isn't susceptible to attacks that inject escape characters to circumvent security)
- Disaster recovery (ensuring that encrypted data can be properly accessed after performing disaster recovery, e.g. can you restore encryption keys?)
- Auditing (making sure you know who's doing what, both unsuccessfully and successfully)
- Ensuring that no prior employees have active security credentials for the infrastructure

I wrote a long article for TechNet Magazine back in 2009 that discusses each of these points in more depth, with links to further information. Although the article is five years old, the information is still current and applicable to all versions of SQL Server. Check it out [here](#).

I also wrote a newsletter editorial in [August 2015](#) about social engineering and the susceptibility of employees to phishing emails that could lead to a security breach – see [here](#).

Call to action: If you're responsible for databases that contain any information that you don't want someone to have unauthorized access to, you need to make sure that your security doesn't have any problems. You never know when someone's going to take aim at your infrastructure.

Glenn's Tech Insights

This section of the newsletter highlights recent news and views from the hardware and Windows worlds that we think will be interesting to SQL Server community members.

Lots of new hardware news last week!

AMD Epyc 7000 Series Processors

AMD is scheduled to release the Epyc 7000 series processors for one and two-socket servers on June 20th, 2017.

The [two-socket version of these processors](#) will have either eight, sixteen, twenty-four, or thirty-two physical cores, along with Simultaneous Multithreading (SMT), which is AMD's version of hyperthreading. The one-socket version of these processors will have either sixteen, twenty-four, or thirty-two physical cores, along with SMT.

These processors will support sixteen DDR4 memory slots per socket (meaning up to 2TB of RAM per socket with 128GB DIMMs), and 64 PCIe 3.0 lanes per socket.

AMD is really pushing the idea of a single-socket Epyc system as a better alternative to a two-socket Intel system for many server workloads. According to AMD, it will be much less expensive, yet will have plenty of cores, memory, and PCIe 3.0 lanes, along with no NUMA overhead. One key advantage AMD has is their [Infinity Fabric](#) modular interconnect technology, that works both within a single processor and between multiple processors.

The key here will be how much single-threaded performance AMD is able to get from this generation of Epyc, and how it compares to Intel's upcoming Skylake-SP processors. It is based on the same Zen architecture as their Ryzen desktop processors. I can't wait to see some benchmarks after the Epyc 7000 series is released.

Intel Xeon Platinum and Gold Processors

Intel is due to release their Skylake-SP processor families sometime this quarter. I have heard that it will be in July, but only Intel really knows what their release plans are. These are going to replace the existing Intel Xeon E5 and E7 v4 processor families.

Intel has been very secretive about the details about these new families, although they are rumored to have up to 32 physical cores, plus hyper-threading.

We do know that they will use a new LGA 3647 socket, so that they will require new server models from the server vendors.

So how does all of this relate to SQL Server? First, if you are contemplating an upgrade to SQL Server 2016 or SQL Server 2017, you should consider waiting until these new platforms are available. Second, if you are going to be using SQL Server 2016 Standard Edition, you need to keep in mind the artificially low, per-instance license limits for memory, and physical cores.

SQL Server 2016 Standard Edition is limited to 24 physical cores per instance. If you buy a new machine with more than 24 cores, Standard Edition will only use the first 24 cores that it finds, regardless of whether they are balanced across any NUMA nodes. To make matters worse, Microsoft will still expect you to pay for all of the physical cores in the machine, even though a

single instance of SQL Server 2016 Standard Edition won't let you use all of them (if you have more than 24).

The moral of this story is that you should not get a machine with more than 24 physical cores for SQL Server 2016 Standard Edition usage. Microsoft has not announced any change in the Standard Edition license limits for SQL Server 2017. Hopefully they will raise the license limits to better accommodate the latest hardware.

#TBT

(Turn Back Time...) This section of the newsletter highlights some older resources we've referred to recently that you may find useful, plus select blog posts we've published since the previous newsletter.

In my SQLSaturday Dublin precon last week I had a discussion about deadlocks with one of the students, so I thought that would be good topic for the #TBT this time. Here are some deadlock resources for you:

- Jonathan's Pluralsight courses: [SQL Server: Deadlock Analysis and Prevention](#)
- The [deadlock entry](#) from our [Accidental DBA blog-post series](#)
- Jonathan's very long SimpleTalk article on [Handling Deadlocks in SQL Server](#), which is an excerpt from his popular (and free) ebook [Troubleshooting SQL Server: A Guide for the Accidental DBA](#)

Here are a few of the blog posts we've published since the last newsletter:

- Paul: [Increased SOS_SCHEDULER_YIELD waits on virtual machines](#)
- Glenn: [SQL Server Diagnostic Information Queries for June 2017](#)
- Jonathan: [Reducing Long R720 POST Boot Time](#)
- Jonathan: [SQL 101: Parallelism Inhibitors – Scalar User Defined Functions](#)
- Erin: [DBCC CLONEDATABASE Cannot insert duplicate key Error](#)

I hope you find these useful and interesting!

Video Demo

In this week's demo video, Jonathan demonstrates how scalar user-defined functions prevent parallelism in SQL Server, how they further impact performance by executing row-by-row, and an alternative design using inline table-valued functions.

The video is around 6.5 minutes long and you can get it:

- In WMV format [here](#)

- In MOV format [here](#)

And the demo code is [here](#).

Enjoy!

Upcoming Immersion Events

All 2017 classes are available for registration!

To help your boss understand the importance of focused, technical training, we've also added a few 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](#)

Bellevue, WA, July/August 2017

- **IEPTO1:** Immersion Event on Performance Tuning and Optimization – Part 1
 - July 31-August 4
- **IEPTO2:** Immersion Event on Performance Tuning and Optimization – Part 2
 - August 7-11

Chicago, IL, October 2017

- **IEPTO1:** Immersion Event on Performance Tuning and Optimization – Part 1
 - October 2-6
- **IE0:** Immersion Event for the Junior/Accidental DBA
 - October 2-4
- **IECAG:** Immersion Event on Clustering and Availability Groups
 - October 5-6 **** New class! ****
- **IESSIS1:** Immersion Event on Learning SQL Server Integration Services
 - October 2-6
- **IEPTO2:** Immersion Event on Performance Tuning and Optimization – Part 2
 - October 9-13
- **IEPDS:** Immersion Event on Practical Data Science
 - October 9-13
- **IEAzure:** Immersion Event on Azure SQL Database and Azure VMs
 - October 9-10 **** New class! ****
- **IEUpgrade:** Immersion Event on Upgrading SQL Server
 - October 11-13 **** New class! ****

Click [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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