(November 21st, 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 the evenings start to draw in for winter, we're hunkering down and continuing to work on new content, with 4-6 new Pluralsight courses coming towards the end of the year!

Happy Thanksgiving to all our U.S. readers (and to U.S. citizens living abroad)!

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

SQLskills News

My latest Pluralsight course has been published! It's called *SQL Server: Understanding and Performing Backups*. Check out the details here.

We're coming back to Europe in 2018! We're bringing four of our Immersion Events to London next September: IEPTO1 and IEPTO2, plus our new classes on Azure and Azure VMs, and clustering and availability groups. See here for details.

Also for our European friends, Erin will be presenting a pre-con workshop at SQLBits in the UK in March – see here for details.

The first batch of 2018 US classes are open for registration! We have all our usual classes, including PowerShell, Azure, Availability Groups, BI strategy, BI security, and more. See here for the 2018 Immersion Event class schedule.

Note: Class prices are going up a bit in 2018 so register in 2017 for 2017 prices/discounts!

Don't forget to check out our SQL101 posts… hopefully they'll help refresh or reinforce topics for even the more seasoned DBAs in the community. The blog posts are automatically collected here.

Finally, even if you can't join us in person, I've put out a call for 2018 remote user group sessions. We did more than 100 of these in 2017 around the world and have 25 set up for 2018 already. If you'd like one of us to present for your user group, check out my blog post here.

Book Review

The latest book I've read is Nina George's *[The Little Paris Bookshop](#)*. I started it earlier this month, on the day our dog Coco died, as a distraction – what could be more uplifting for a bibliophile than a book about books and a bookshop? It's a lovely book, about a bookseller who prescribes certain books to ease his customers' pains. He loses love, takes his floating bookshop upriver from Paris, and finds it again. It's a departure from the usual genres I frequent, and it's a gentle read and very relaxing. And did I mention it's about books? 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.

Jonathan sent me this last week, from one of his Army Reserves training days:

> *A recently-married husband came home while his wife was making a roast for dinner. He watched her season the roast, then cut the ends off of it before putting it in the pot and putting it in the oven. Curious, he asked her why she cut the ends off the roast and she replied, "That's how my mother always did it." Intrigued, she called her mom and asked her why she cut the ends off the roast and her mother replied she didn't know, that's the way her mother always did it. So, they called the grandmother who laughed and said, "Well, when grandpa and I got married we didn't have much money and our roasting pot was too small so I had to cut the ends off the roast to make it fit."*

And then we had a new client last week who was restarting their SQL Server every night and rebooting their Windows Server every week. When we asked them why, they explained:

- *It always seemed to help…*
  We've heard this many times with older servers – especially with SQL Server 2000. A common problem in SQL Server 2000 was that the plan cache was able to grow up to 4GB and when it did this, it would do so by stealing from the buffer pool. If your machine wasn't using AWE and you only had 4GB of memory then this would cause a lot of performance problems. Basically, when this happened, queries slowed down due to excessive physical I/O. By restarting their instance every night, they'd get rid of the plan cache and start over again (and things would slow down during the day but their restart seemed to fix it.) Without even knowing why it worked in the past, they'd continued to do that ever since, on all versions of SQL Server – because it seemed to help in the past.
- With old versions of Windows Server, instabilities would occur and they could be prevented by rebooting the server every week, so they've continued to do that ever since.

Of course, neither of these behaviors apply any more, but they continued to do it because that's how it had always been done and they'd never been told to stop doing it.

Another example is how if *DBCC CHECKDB* on SQL Server 2000 told you there was a corruption, the accepted behavior was to run it again (or run it using *WITH TABLOCK*), and if you got the same corruption report, there really was corruption. The second run stopped being necessary with SQL Server 2005.

Bottom line: Sometimes behaviors and practices persist, even though they're no longer necessary, and they can cause performance problems – like emptying the plan cache and buffer pool every night!

Paul's Ponderings

Nothing technical this time.

Kimberly and I (and our girls) recently lost our beloved dog Coco (a female chocolate Labrador). She was 12.5 and had slowed down a lot over the last few years, and recently she'd had some heart problems. We were scared that she'd pass away when we were away somewhere (she lives with our assistant when we're not home), but as it turned out, she passed away in Kimberly's arms in the early hours of November 8th. She was the sweetest, most loving dog, and didn't have a vicious bone in her body. She did have a great bark though and it scared many but her attack would have been only to lick you to death! She's forever in our hearts…

Ok – I had to get up and have a break after typing that…

Thanksgiving in the U.S. is a time to give thanks for everything and everyone we have in our lives. I wrote a blog post last week for the latest T-SQL Tuesday that talked about and thanked the three people who had the most impact on my life in the world of data (Dave Campbell, Bob Ward, and Kimberly) – you can read it here. I'm also constantly thankful for our family, our friends, our health, our life, and our happiness. It's in this spirit that I write this newsletter and dedicate it to our lovely Coco. RIP Coco (March 27, 2005 – November 8, 2017).

Call to action: Sometimes a person or pet is taken from you unexpectedly and you wish they were still around to give them a hug and/or say thanks. My call to action this time is simply to say thanks and/or give a hug to those people and animals you care about, as they won't be there forever. Also, take photos and videos – even of the "boring stuff" as we found the images (and especially some of the videos) to be tremendously comforting to us. And, make sure you have your images backed up!

[Side note from Kimberly: As I was going through and pulling together a lot of my Coco images, I found that for images prior to 2009, I hadn't been as consistent with how I stored them. Luckily, they were backed up but cataloging and searching were more difficult. It made me think more about my workflow as well as the plethora of un-scanned negatives and slides that I still have yet to digitize. The main point is that it might also be a good time to go through your image catalog, make sure you have things sufficiently backed up, and re-vamp your image cataloging,

storing, backup workflow. I have a few things planned for my time-off during the holidays, I'll try to create a blog post about my workflow / strategies as well as a few tips and tricks along the way! It would be fun to compare workflows so I'll look forward to your comments on my post. Stay tuned!]

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.

Blue Origin New Glenn Rocket Due to Launch in 2020

Jeff Bezos company Blue Origin is scheduled to launch their New Glenn rocket with a combination of BE3 and BE-4 engines in 2020. This video shows the concept of operation. This rocket will have either two or three stages, with the first stage being able to land and be reused similar to the SpaceX Falcon 9.

Having additional competition and capability in the private launch business can only be a good thing, especially if we are serious about getting back to the Moon and going to Mars.

Intel Optane SSD DC 4800X 750GB Released

This larger capacity product is initially being released as a half-height, half-length add-in-card (HHHL AIC) or a 2.5" U.2 form factor, both of which are using a PCI 3.0 x4 interface and the NVMe protocol.

According to some early tests I have seen, the Intel Optane DC P4800X offers roughly 10X the IOPS of current NAND storage devices at much lower queue depths, and completes those requests in about $1/10^{th}$ of the time.

The P4800X's write endurance rating of 30 drive writes per day is also much higher than most enterprise NAND flash SSDs.

The Intel Optane SSD DC 4800X is roughly three times the cost-per-GB of NAND Enterprise SSDs. You might be wondering why this product that warrants the extra cost? Here are some of the advantages over current NAND-based flash storage devices:

- High random read and write performance
- High performance at low queue depths
- High simultaneous read and write performance
- High read and write performance at small capacity points (unlike NAND)
- High performance maintained as the drive fills with data
- Higher endurance than current NAND technology

Traditional NAND-based SSDs excel at very high queue depths that are not usually encountered outside of synthetic benchmarks (especially for random read performance). Optane-based SSDs perform extremely well for random reads at low queue depths. This gives you outstanding responsiveness and performance where it is going to be most noticeable in daily usage.

Anandtech has a hands-on review of the 750GB Intel Optane SSD DC 4800X here.

Having the option of this type of storage could be very useful for some types of SQL Server workloads. I recently bought a 480GB Intel Optane SSD 900p, which has nearly identical components and very similar performance.

Micron Doubles the Capacity of NVDIMM Modules

At the SC17 show in Denver, Micron announced new 32GB NVDIMM-N persistent memory modules that have twice the capacity (and increased bandwidth) compared to previous 16GB modules. These new modules have 32GB of DDR4 RDIMM and 64GB of SLC flash with a bandwidth of 23.47GB/sec and a data rate of 2933 mega-transfers per second (MT/S).

NVDIMMs are another layer in the memory/storage hierarchy, offering DRAM-like low latency with the nonvolatility of NAND to back up data if power is lost. Storage class memory like 3D XPoint (Intel Optane) are a second, somewhat slower layer in the memory/storage hierarchy, before moving down to PCIe NVMe NAND flash storage.

Micron is collaborating with Dell/EMC and VMware to provide NVDIMM support for in a future version VMware vSphere.

#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 this TBT I want to point you at a 30-part blog post series that the team did a few years ago that covers a lot of introductory topics, aimed at accidental/involuntary DBAs. Rather than listing all 30 posts, here is a link to the main page for the series. The series covers these main areas:

- Setup and configuration
- Backups
- Implementing maintenance and security
- Troubleshooting performance
- High availability
- General troubleshooting

Although the series was aimed at accidental DBAs, these posts are all worth reading to make sure your basic understanding of topics is current and complete.

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

- Paul: *TSQL Tuesday #96: Folks Who Have Made a Difference*
- Paul: *New Pluralsight course: Understanding and Performing Backups*
- Paul: *Calling all user group leaders! We want to present for you in 2018!*
- Paul: *New Pluralsight course: Understanding, Configuring, and Troubleshooting Log Shipping*
- Erin: *Query Store and Availability Groups*
- Glenn: *Initial CrystalDiskMark Results for Intel Optane 900p*

I hope you find these useful and interesting!

Video Demo

The demo this time is from my new Pluralsight course *SQL Server: Understanding and Performing Backups* and shows the behavior of differential backups over time in terms of their size.

The video is 6 minutes long and is in MOV format here.

The demo code is here.

Enjoy!

Upcoming Immersion Events

We've released our Immersion Event schedule in the U.S. and London through September 2018 and our classes are open for registration. And, we've just added some new ones on security and data due diligence/BI. Over the coming weeks we'll add one more class to the Spring line-up in Chicago, on data mining and AI.

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
- So why do you want to come to our training? And the winners are…
- Community blog posts about our classes
- Immersion Event FAQ

Chicago, IL, April/May 2018 **(all classes have discounts for 2017 registrations!)**

- **IEPTO1**: Immersion Event on Performance Tuning and Optimization – Part 1
  - April 23-27
- **IE0**: Immersion Event for the Junior/Accidental DBA
  - April 23-25
- **IEUpgrade**: Immersion Event on Upgrading SQL Server
  - April 23-25
- **IECAG**: Immersion Event on Clustering and Availability Groups
  - April 26-27
- **IEAzure**: Immersion Event on Azure SQL Database and Azure VMs
  - April 26-27
- **IEPTO2**: Immersion Event on Performance Tuning and Optimization – Part 2
  - April 30-May 4
- **IEBIStrat**: Immersion Event on Developing a BI and Analytics Strategy **(** NEW **)**
  - April 30-May 2
- **IEBISec**: Immersion Event on Securing Your BI Platform **(** NEW **)**
  - May 3-4
- **IEPS**: Immersion Event on PowerShell for SQL Server DBAs
  - April 30-May 2
- **IESSIS1**: Immersion Event on Learning SQL Server Integration Services
  - May 7-11

Bellevue, WA, June 2018 **(all classes have discounts for 2017 registrations!)**

- **IEPTO1**: Immersion Event on Performance Tuning and Optimization – Part 1
  - June 18-22

London, UK, September 2018 **(all classes have discounts for 2017 registrations!)**

- **IEPTO1**: Immersion Event on Performance Tuning and Optimization – Part 1
  - September 10-14
- **IEAzure**: Immersion Event on Azure SQL Database and Azure VMs
  - September 10-11
- **IECAG**: Immersion Event on Clustering and Availability Groups
  - September 12-13
- **IEPTO2**: Immersion Event on Performance Tuning and Optimization – Part 2
  - September 17-21

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

<u>Summary</u>

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

Paul@SQLskills.com and Kimberly@SQLskills.com