(February 12th, 2019)

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.

Note: As an Insider, you can read all prior Insider newsletters here.

Quick Tips for our Insider friends!

Hey Insiders,

This newsletter is coming to you from Redmond, where we're home until April and working hard on SQL Server on Linux material. As I'm writing this (Friday) snow is falling hard for the second time in a week, which is extremely rare for the Seattle area, and we've got snow in the forecast all next week too! We're hunkered down with lots of food, lots of SQL, and lots of crafts to fill the time!

You can save $100 off any online class when you use the discount code 'newsletter' for new registrations over the next two weeks!

And if you're in Europe, also check out Erin's SQLBits precon on February 27th!

SQLskills News

You can find all the details of our upcoming classes (pricing, logistics, registration, curriculum) by drilling down from the class schedule page here, and there's a list of classes at the bottom of the newsletter.

Live, ONLINE classes: we're delivering an online class every two weeks through the end of March. It's the perfect way to keep learning, keep your systems moving forward, and stay motivated! And our format has received rave reviews: each class is held over three, *slightly-longer-than-half* days with a combination of lecture/demo and open Q&A. You can deep-dive into important content as well as keep up with your office workload! This is the place to learn new tech and get your questions answered!

Live, IN-PERSON classes: we're back in Chicago in April/May 2019 and our classes are open for registration, including a **new class on Power BI** taught by Tim. We've decided that these classes (in Chicago in April/May) are our ONLY in-person, Immersion Events for this year. We are not planning any events in the Fall or in Europe due to other commitments, conferences, and online training.

If you're looking for a great place to learn best practices in migration, troubleshooting, and performance, join us in Florida in June for our Spring SQLintersection conference where we're

going to focus on this incredibly important process. SQLintersection will not only help you get to a newer version of SQL Server but it will teach you the best new features to leverage once you're there!

Finally, even if you can't join us in person, I've put out a call for **2019 remote user group sessions** and we've got 32 scheduled this year 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 Jonathan Balcombe's *[What a Fish Knows: The Inner Lives of Our Underwater Cousins](#)*. Contrary to popular belief, fish do have intelligence, just not like humans. Fish can recognize individuals, learn to use tools, plan for a future event (a grouper signaling to a moray to hunt cooperatively, or a grouper pointing head down at prey hidden in a hole), play, and more. We generally think of fish as dumb things that lead simple lives, but reality is much more complex. This book is a fascinating exploration of what and how fishes perceive, feel, think, know, breed, and are exploited, drawing on myriad scientific studies and interactions. Highly recommended!

The Curious Case of…

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

Jonathan came across an interesting issue this week while working with a client. He was configuring a basic availability group on Standard Edition and found that the failover of the AG and the provisioning of the AG listener was repeatedly timing out.

After a bit of investigation and experimentation using his local AG playground, he figured out what was happening. During the failover, the cluster network name resources were waiting for DNS registration, and that's what was causing the timeout.

The fix for this is to drill into the IPv4 settings, go to the DNS section of the Advanced TCP/IP Settings screen, and uncheck 'Register this connection's addresses in DNS'. Problem solved!

Bottom line: If you have a cluster network name resource that is slow to come online or go offline, it's going to affect the failover time of an AG or FCI, so make sure to change the network setting as described above.

Paul's Ponderings

Well, when I wrote the first part of the newsletter on Friday, it was snowing. Now, it's Sunday and it's snowing again. Many of you will be thinking 'pah – that's nothing', but for Seattle it's a big deal as we're not used to snow that lingers for more than a couple of days. And, our terrain

isn't flat like the snowy Midwest so once snow sticks, it's hard to move around. Basically, the Seattle-Redmond area shuts down in heavy snow. However, usually warm weather comes in behind the snow and melts it away relatively quickly. This time that's not the case; we've had snow and ice on the ground here for over a week, with more snow today, more in the forecast for Monday, hard freezes and more snow at the end of the week. The snow here even made the front page of the BBC News website!

One problem that could crop up is tree branches snapping and taking out power lines. Luckily, we have a generator with an automatic transfer switch. Unluckily, it's broken.

We found this out a couple of weeks back when the power went out one evening and the house stayed dark. I went out and got the generator to start a couple of times but it wouldn't stay on for more than five minutes.

Jeff, the generator guy finally made it to the house on Thursday (right before the big storm was supposed to hit), and we discovered that the alternator bearing had gone – dead generator for another week at least.

The root cause? I forgot to have the generator serviced this last Fall and didn't notice when the weekly self-test didn't happen through January. We always notice when we hear the self-tests but it didn't occur to us that we hadn't heard it for a few weeks…

Jeff primarily works on commercial backup generators, and I was joking with him that I always tell HA/DR classes to make sure someone stirs the diesel every week so the generator actually works when the power goes out. So, imagine my embarrassment writing this, realizing that we messed up the HA for our own house!

Call to action: Make sure you do regular HA/DR testing so that when a disaster does occur, the HA/DR plan has a good chance of working. This includes regular generator and UPS testing. Regular practice of restoring backups. Regular practice of provisioning a new server from scratch. Regular, regular, regular… the more you can test and practice, the better prepared you'll be.

For us, we're adding annual reminders for the Fall for generator maintenance so that we're prepared for the winter! And, we'll also periodically check to make sure that the weekly self-tests are running as scheduled.

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.

AMD EPYC and Threadripper Performance Issues on Windows

There have been a number of articles and videos discussing performance issues with current generation AMD EPYC processors and high-end AMD Threadripper processors (including the Threadripper 2990WX and 2970WX) on Windows (including Windows 10 and Windows Server 2016).

Techgage has a new round of testing comparing the performance of the default configuration, using AMD's Dynamic Local Mode, and using the Coreprio utility, and comparing performance between Linux and Windows. Anandtech has a recent article that claims that Microsoft and AMD are aware of this issue and that they are working together to address it. I hope we see a Windows kernel fix sooner rather than later, so that we get the best Windows performance possible with these AMD processors.

I have also read some reports of performance issues with virtualization when using these AMD processors.

Microsoft Announces GA of Lsv2-series Azure Virtual Machines

This new series of Azure Virtual Machines uses the AMD EPYC 7551 processor, along with local NVMe storage. The AMD EPYC 7551 has 32 cores/64 threads, with a base clock speed of 2GHz and a max boost clock speed of 3.0 GHz. They support 128 PCIe 3.0 lanes per socket (they work in one or two-socket servers), and up to 2TB of RAM per socket. These VMs are aimed at high throughput and high IOPS workloads (such as you might see with SQL Server). I think these would be well-suited for data warehouse type workloads.

These VMs range in size from the L8s_v2, with eight vCPUs, 64GB of RAM and one local 1.92 TB NVMe drive (which gives 340K read IOPS and 2,000 MBps of sequential throughput) to the L80s_v2, with 80 vCPUs, 640GB of RAM and ten local 1.92 TB NVMe drives (which gives 3400K read IOPS and 22,000 MBps of sequential throughput). Microsoft has more detailed documentation about storage optimized virtual machine sizes here.

Intel Releases Xeon W-3175X Workstation Processor

On January 30, 2019, Intel released their flagship Xeon W-3175X processor. This expensive 14nm beast has 28 cores/ 56 threads with a base clock speed of 3.1 GHz and a max turbo (all-core) clock speed of 3.8 GHz and 38.5MB of L3 cache. It is based on the Intel Xeon Platinum 8180, which costs $10,005.00, but this processor *only* costs $2,999.00. It is meant for single-socket, high-end workstations, and there are conflicting reports about whether Intel will sell the processor directly to consumers or only to system-integrators. A pre-built system with this processor will start at about $10,000.00 and could go much higher depending on what components are used.

If you can afford it, a Xeon W-3175X-based system will deliver extremely high performance on some workloads. More affordable alternatives from both Intel and AMD are available that will

easily beat the Xeon W-3175X on specific workloads. For example, an Intel Corei9-9900K has significantly better single-threaded performance, while an AMD Ryzen Threadripper 2950X does better on some multi-threaded workloads (for a fraction of the cost). Here are some reviews of this processor:

- [The Intel Xeon W-3175X Review: 28 Unlocked Cores, $2999](#)
- [Intel Xeon W-3175X 28-Core Skylake-SP CPU Review](#)
- [Intel Xeon W-3175X Review: Ultimate Performance at the Ultimate Price](#)

#TBT

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

The theme for the TBT this time is log shipping. It's been around forever, is simple to configure, and has a bunch of uses. Here are some useful links:

- Glenn's Pluralsight course: *[SQL Server: Understanding, Configuring and Troubleshooting Log Shipping](#)*
- Whitepapers:
    - *[Database Mirroring and Log Shipping Part I – Prescriptive Guidance](#)*
    - *[Proven SQL Server Architectures for High Availability and Disaster Recovery](#)* (written by me)
    - *[Database Mirroring and Log Shipping Working Together](#)*
- Blog posts:
    - Paul: *[SQLskills SQL101: Log shipping performance problems](#)*
    - Glenn: *[Upgrading SQL Server–Migrating with Log Shipping](#)*

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

- Paul: *[Changing the SSH port for a RHEL Azure VM](#)*
- Glenn: *[SQL Server Diagnostic Information Queries for February 2019](#)*
- Glenn: *[Avoiding SQL Server Upgrade Performance Issues](#)*
- Glenn: *[Compatibility Levels and Cardinality Estimation Primer](#)*

I hope you find these useful and interesting!

Video Demo

From Erin: Continuing our Columnstore theme, this week Erin steps through some testing you can do when creating Columnstore indexes to ensure they are getting used as you expect, and that they are providing the performance benefit you expect!

The video is just over 10 minutes long and you can get it [here](#).

The demo code is [here](#).

Enjoy!

<u>Upcoming SQLskills Events</u>

Our **ONLY** set of 2019 live, in-person events has been announced for Chicago in April/May and we've also published our full 2019 Q1 lineup of live, online classes.

You still have multiple learning opportunities as every event has a different focus as well as different benefits – from deep-technical training in our Immersion Events to wide-ranging topics at SQLintersection where you can learn more effectively how to keep moving forward in both your environment and your career! And, of course, one benefit you'll always get from in-person events is networking; we hope to meet/see you at an event soon!

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](#)

LIVE, ONLINE Immersion Events:

- **IEQUERY**: Immersion Event on Fixing Slow Queries, Inefficient Code, and Caching/Statistics Problems
    - February 12-14 (started today)
- **IETLB**: Immersion Event on Transactions, Locking, Blocking, Isolation, and Versioning
    - February 26-28
- **IEVLT**: Immersion Event on Very Large Tables: Optimizing Performance and Availability through Partitioning
    - March 12-14
- **IECS**: Immersion Event on Columnstore Indexes
    - March 26-28 **** NEW ****

LIVE, IN-PERSON Immersion Events:

Chicago, IL, April/May 2019

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

- o April 29-May 3
- **IECAG**: Immersion Event on Clustering and Availability Groups
  - o April 29-30
- **IEPowerBI**: Immersion Event on Power BI, Power BI Report Server, and SSRS
  - o April 29-30 **** NEW ****
- **IE0**: Immersion Event for the Junior/Accidental DBA
  - o May 1-3
- **IEUpgrade**: Immersion Event on Upgrading SQL Server
  - o May 1-3
- **IEPTO2**: Immersion Event on Performance Tuning and Optimization – Part 2
  - o May 6-10
- **IEPML**: Immersion Event on Practical Machine Learning
  - o May 6-10
- **IEAzure**: Immersion Event on Azure SQL Database, Azure VMs, and Azure Managed Instance
  - o May 6-9

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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