

(June 28<sup>th</sup>, 2021)

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!**

This newsletter is coming to you from Concrete, WA, where I'm camping and working on our land all through the summer. The heatwave last weekend was wild – it hit over 110F here!

This is the last newsletter until mid-August, as we take our traditional summer break.

Don't forget the summer sale is on for the next two weeks, and happy July 4<sup>th</sup> to all our American readers!

### **Take care and stay safe out there!**

#### **SQLskills News**

#### **SQLskills Summer School Special Savings SALE!**

Starting just in time for summer, we are offering our lowest prices EVER on all recorded courses and bundles. We just completed our spring series of courses and have new recordings for SQL Server 2019. AND, our "Summer School Special" includes some extra time to really dive in as you'll get the summer for FREE! Recordings are usually accessible for 1 year from the date of purchase. For purchases made during the sale, your access won't expire until **Sept 30, 2022!**

The sale lasts through the end of Friday, July 10. Each course is available individually but there are also even better budget-friendly bundles! Start thinking about what you want to learn and invest in your SQL Server future!

All the details are below and in our [online shop](#). Also, be sure to check out our suggested [Learning Paths](#), based on where you are in your data professional career.

Here's what we have to offer (all prices in USD):

- IE0: Immersion Event for the Accidental and Junior DBA
  - Recorded on SQL Server 2019 over 8 half days for over **32 HOURS** of content
  - Special 2020 Price \$2,495 LIVE (normal price \$3,295) and 1 year access recordings for \$1,695
  - **Summer School Savings SALE price: only \$1,295**

- IEAzure: Immersion Event on Azure SQL Database, Azure VMs, and Azure Managed Instance
  - Recorded on SQL Server 2019 over 6 half days for over **22 HOURS** of content
  - Regularly priced at \$3,295 LIVE and 1 year access recordings for \$1,695
  - **Summer School Savings SALE price: only \$1,295**
- IEPTO1: Immersion Event on Performance Tuning and Optimization – Part 1
  - Recorded on SQL Server 2019 over 10 half days for over **43 HOURS** of content
  - Regularly priced at \$3,995 LIVE and 1 year access recordings for \$1,995
  - **Summer School Savings SALE price: only \$1,595**
- IEPTO2: Immersion Event on Performance Tuning and Optimization – Part 2
  - Recorded on SQL Server 2019 over 10 half days for over **40 HOURS** of content
  - Regularly priced at \$3,995 LIVE and 1 year access recordings for \$1,995
  - **Summer School Savings SALE price: only \$1,595**
- IECAG: Immersion Event on Clustering and Availability Groups
  - Recorded on SQL Server 2019 over 4 half days for over **18 HOURS** of content
  - Regularly priced at \$1,695 LIVE and 1 year access recordings for \$845
  - **Summer School Savings SALE price: only \$695**
- IEQS: Immersion Event on Solving Common Performance Problems with Query Store
  - Recorded on SQL Server 2019 over 3 half days for almost **10 HOURS** of content
  - Regularly priced at \$995 LIVE and 1 year access recordings for \$495
  - **Summer School Savings SALE price: only \$395**
- IEVLT: Immersion Event on Very Large Tables: Optimizing Performance and Availability through Partitioning
  - Recorded on SQL Server 2019 over 4 half days for almost **14 HOURS** of content
  - Regularly priced at \$995 LIVE and 1 year access recordings for \$495
  - **Summer School Savings SALE price: only \$395**
- IEQuery: Immersion Event on Fixing Slow Queries, Inefficient Code, and Caching/Statistics Problems
  - Recorded on SQL Server 2017 over 3 half days for over **11 HOURS** of content
  - Regularly priced at \$695 LIVE and 1 year access recordings for \$395
  - **Summer School Savings SALE price: only \$295**
- IETLB: Immersion Event on Transactions, Locking, Blocking, Isolation, and Versioning
  - Recorded on SQL Server 2017 over 3 half days for over **13 HOURS** of content
  - Regularly priced at \$695 LIVE and 1 year access recordings for \$395
  - **Summer School Savings SALE price: only \$295**
- IECS: Immersion Event on Columnstore Indexes
  - Recorded on SQL Server 2017 over 3 half days for almost **11 HOURS** of content
  - Regularly priced at \$695 LIVE and 1 year access recordings for \$395
  - **Summer School Savings SALE price: only \$295**

And we have four bundles:

### **SQL Server Jumpstart Bundle**

**IE0 + IEQuery + IETLB: Summer School Savings BUNDLE price: only \$1,495**

**\*\* 70% SAVINGS off of full price PLUS 3 months FREE \*\***

*ADD the remaining 3 Short Courses (IEQuery / IEVLT / IECS) for only \$500*

### **Performance Tuning Bundle**

**IEPTO1 + IEPTO2: Summer School Savings BUNDLE price: only \$2,495**

**\*\* 70% SAVINGS off of full price PLUS 3 months FREE \*\***

### **Complete Short Course Bundle**

**IEQuery + IETLB + IEQS + IEVLT + IECS: Summer School Savings BUNDLE price: only \$995**

**\*\* 80% SAVINGS off of full price PLUS 3 months FREE \*\***

### **BlackBelt Bundle**

**IEAzure + IEPTO1 + IEPTO2 + IECAG + IEQS + IEVLT + IECS: Summer School Savings BUNDLE price: only \$4,995**

**\*\* 70% SAVINGS off of full price PLUS 3 months FREE \*\***

Also, if you're an alumnus of one of our prior courses, your online account will automatically give you an ADDITIONAL 5% discount. If you don't already have an account on our system – but you are a prior student (of ANY Immersion Event)– please [send Kimberly an email](#) to get you set up as an alumnus.

### **Book Review**

From the 2009 archives:

Firstly, Muriel Barbery's [The Elegance of the Hedgehog](#). Translated from French, this wonderful book concerns a concierge of an upper-class apartment building in Paris. She's low-born but very intelligent, which she hides from the vacuous residents of the building. The other major character is a 12-yr old girl, also hyper-intelligent, but unhappy and suicidal, with startling insights on life. Life changes for them both. Beautiful book, highly recommended.

Secondly, Michael Cox's [The Meaning of Night: A Confession](#). Superlative story telling! I've been reading this (long) one for a few months on and off. It's a compelling tale of a man

discovering his true origins and trying to win back what is his, with twists and turns along the way - written as a confession from the point of view of the man himself. Dark and brooding, mixed in with life in England in the 1850s. Highly recommended!

Lastly, Magnus Magnusson's [\*Scotland: The Story of a Nation\*](#) (my 100<sup>th</sup> both in 2009). +I deliberately chose my goal-meeting final book of the year to be Magnusson's magnum opus: his 700pp work on the history of Scotland. Extraordinarily well-written and comprehensively researched, I strongly recommend this book to anyone with Scottish roots.

### **The Curious Case of...**

*This section of the newsletter explains recent problems we've helped with on client systems or been asked about over email or #sqlhelp; they might be something you're experiencing too.*

Over the last few months we've had some clients discuss backup strategy with us, and we always say not to plan a backup strategy. "Uh, what?" you're thinking... Read about the right way to do it in Jon's recent blog post [here](#)...

### **Ponderings...**

*(From me this time – enjoy!)*

One of the questions we get asked every so often is why a developer or DBA should know some of how SQL Server works – the internals – and isn't that just knowledge to satisfy intellectual curiosity?

Here are a couple of examples of why it's useful to know how SQL Server does things under the covers, and how it can impact your performance.

Firstly, understanding how SQL Server stores column values in records. This is really relevant when designing an efficient table schema. Just last week I saw a case where a client was indicating "whether this value has been deleted or not" using an NVARCHAR (3) column, using the values "YES" and "NO". This will take 6 bytes for "YES", four bytes for "NO", and at least two extra bytes in either case for the pointer in the variable-length column offset array in the record. Instead, the indicator could be stored as a BIT column, which takes only 1 bit and can be combined within one byte for up to eight separate BIT columns in a record (NOTE: When there's only one bit column then the row will still reserve one byte; rows are always on byte-boundaries, not bit-boundaries).

Having said that, a two billion-record table, using the NVARCHAR (3) column (let's say with half "YES" and half "NO" values) would take  $(1 \text{ billion} \times 8) + (1 \text{ billion} \times 6) + (2 \text{ billion} \times 2) = 13\text{GB}$ , compared with  $2 \text{ billion} \times 1 = 1.86\text{GB}$ . That's a huge difference. Some might say that in

the grand scheme of things, 11 extra GB is negligible, but if many more columns have inefficient design, that adds up quickly. Think of extra disk space, extra log space, extra buffer pool space, lower data density, larger backup size, longer restore times, and so on. Kimberly has a Pluralsight course that covers this in detail: [SQL Server: Why Physical Database Design Matters](#).

Secondly, understanding how page/extent allocation works. This is most relevant when dealing with tempdb PAGELATCH\_XX contention (less so with advances made in SQL Server 2019). Understanding that various allocation bitmaps need to be updated in memory whenever a page or extent is allocated explains why the contention occurs when many concurrent connections are creating and dropping small temp tables. Understanding how adding more tempdb data files allows the round-robin allocation algorithm to be used explains why adding more tempdb data files can reduce the overall PAGELATCH\_XX contention on in-memory copies of allocation bitmaps (by having more bitmaps to share amongst the threads instead of just one) and lead to a workload throughput increase. See [this blog post](#) for more details.

Even something as seemingly obscure and esoteric as how SQL Server computes allocation unit IDs (which I [blogged](#) about) is useful to know when dealing with database corruption and you need to manually find data file pages belonging to a corrupt table because `sys.sysallocunits` is damaged so queries and `DBCC CHECKDB` fail.

**Call to action:** Don't dismiss knowing how SQL Server works as useless information. Knowing how SQL Server stores data, uses indexes, uses statistics, manages the transaction log, manages transactions, uses locks, uses latches, and so on can really help you design and tune your databases and workloads for optimal performance. And there's a wealth of information out there, ranging from blog posts to books to online training to in-person training.

## **#TBT**

*(Turn Back Time...) Blog posts we've published since the previous newsletter plus some older resources we've referred to recently that you may find useful.*

Extended Events are the theme for #TBT this time. Here are some Extended Events resources for you:

- Jon's two Pluralsight courses: [SQL Server: Introduction to Extended Events](#) and [SQL Server: Advanced Extended Events](#)
- Erin's Pluralsight course: [SQL Server: Replacing Profiler with Extended Events](#)
- Jon's [An-XEvent-a-Day blog post series](#)
- Jon's [Extended Events blog category](#)
- Jon's [article on sqlperformance.com](#) comparing the overhead of trace vs. XEvents
- Erin's [Extended Events blog category](#)
- Erin's [Stairway Series](#) on SQL Server Central

- My [Extended Events blog category](#) which shows how to capture SQL Server call stacks

And since the last newsletter, blog posts:

- Paul: [The FGCB ADD REMOVE Latch](#)
- Jonathan: [Stop Planning a Backup Strategy](#)

I hope you find these useful and interesting!

### **Video Demo**

The demo video this time is an excerpt from Jonathan's Pluralsight course [SQL Server: Using SentryOne Plan Explorer](#). Jonathan demonstrates how to use Plan Explorer to analyze statistics histograms to find potential performance problems.

The video is almost 7 minutes long and you can get it in MP4 format [here](#), and the demo code is [here](#).

Enjoy!

### **Upcoming SQLskills Events**

Our spring 2021 classes are over – see the top of the newsletter for amazing prices on course recordings!

With our new streaming system, you can now choose to attend a live, online event or purchase a recording to watch at your leisure, either individually or as part of a bundle. And all attendees of live events get lifetime access to the class recordings too!

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](#)

### **LIVE, Online Immersion Events:**

Fall 2021

- Schedule coming soon...

You can get all the details on our [training options page](#) or just go directly to our [new shop](#).

## **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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