

SQLintersection

PRECON01

**STUDY GUIDE: 50 Things All SQL Server
Developers Need to Know**

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SQL Sentry



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Agenda

- **Part I: High-Level Architecture and Internals**
 - ACID, the Relational Engine, and Query processor
 - Storage Engine, Access Methods, Cache Aging, and Wait Stats
 - Locking & Blocking
 - Isolation Levels
- **Part II: Important SQL Fundamentals**
 - Indexing Fundamentals
 - Statistics and Cardinality
- **Part III: Low-Level Analysis and Specific Techniques**
 - Query Plan Overview
 - Query Tuning Methodology
 - Trace Flags

NOTE: All demo code and workshop slides are provided to workshop attendees for THIS workshop on USB sticks provided by SQL Sentry.



High-Level Architecture and Internals



- **ACID properties of transactions:**

- ☐ A _____
- ☐ C _____
- ☐ I _____
- ☐ D _____

- **Overhead _____ with each letter of the acronym.**

- **_____ handles assigning a new user to a thread.**

- **_____ dissects a language event to see where it understands the syntax**



- The _____ is the most complex component of the Relational Engine.
- Query processing has _____ steps when creating an execution plan.
- The number of CPUs dictates the number of _____ available to SQL Server.
- Threads accumulate Wait Stats in two broad categories: _____ waits and _____ waits.

- The _____ tells the Buffer Manager to open tables, retrieve data, and change data.
- Plan and data caches are buffered according to an _____ algorithm.
- The _____ process cleans up after objects that are ready to be purged from the cache.
- The _____ process pushes dirty pages from the data cache to the database files.

Important SQL Fundamentals



- In a heap or clustered index, 8k pages where the data resides are known as _____ pages.
- Non-leaf pages of an index are part of a _____ tree structure.
- _____ for query optimization are objects that contain statistical information about the distribution of values in one or more columns of a table or indexed view.
- The query optimizer uses these statistics to estimate the _____, or number of rows, in the query result.
- These _____ enable the query optimizer to create a high-quality query plan.

- When reading from an index, the _____ operation is usually much faster than the _____ operation.
- A _____ index is an index which can return a query's entire result set from the non-leaf pages of the index.
- An index with _____ contains the data within the index, but does not use that data for statistical purposes.
- A _____ is like an index with a WHERE clause.
- These _____ enable the query optimizer to create a high-quality query plan.

- Using the default settings, SQL Server will update index statistics on a table that changes _____% or more.
- The _____ of an describes the nature of the search arguments it will use to help the query processor.
- An index with _____ contains the data within the index, but does not use that data for statistical purposes.
- When a leaf page is 100% full and an INSERT or UPDATE causes the data to spill over a single 8k page, a _____ will occur.
- Logical _____ of a table and/or index could be caused by page splits, shrinking a database, or other operations.

Low-Level Analysis and Specific SQL Techniques



- When tuning queries or transactions, you will want to use either a _____ cache or a _____ cache to ensure the query metrics are consistent.
- You want high plan reuse and low plan _____ , as a general rule of thumb.
- The most common cause of frequent recompiles is interleaving _____ and _____ statements.
- Most people just look at the _____ metric of an execution plan, but there are many other useful metrics.
- The SIMPLE, BULK INSERT, and FULL modes are _____ models, which directly impact the Transaction Log.

- SQL Server uses a _____ log mechanism.
- Compatibility level settings can affect both _____ and _____.
- Windowing functions can help reduce or eliminate the _____ nature of self-joins.
- Using SELECT * can cause unnecessary _____, _____ and _____.
- A view with SELECT * can cache old metadata until you run _____ or alter the view.

- Always specifying the _____ will ensure SQL Server does not waste cycles looking for objects in the wrong place.
- Specifying varchar without length can sometimes yield a size of _____ character(s), and sometimes _____ character(s).
- Rounding can cause inaccuracy of date range queries when using _____. _____ ranges are safer.
- Even though MERGE is technically one statement, it is still vulnerable to _____ conditions.
- You can avoid a lot of optimization problems by using _____ SQL, and avoid plan cache bloat with the _____ setting.

- Single-pass, read-only cursors should not use the _____ options.
- Total count for a table (or filtered index) can come from _____.
- _____ has an implicit DISTINCT, while UNION ALL does not.
- It is usually better to use _____ over NOT IN.
- There is no point in trying to add _____ in a view, since SQL Server will generally ignore this.

- Table variables store their data ____.
- With MERGE, triggers can fire ____.
- A column should never store more than one ____.
- Old-style joins make it easy to mix ____ criteria and ____ criteria.
- NOLOCK will allow you to read the same row ____ or _____. A good alternative can be _____.

Questions?

- **Send questions to us at:**
 - kekline@sqlsentry.net
 - abertrand@sqlsentry.net
- **Twitter, FB, LI @KEKline and @AaronBertrand**
- **Blogs at SQLblog.com**
 - Aaron at <http://SQLPerformance.com>
 - Kevin at <http://KevinEKline.com>
- **Come see us at the booth!**



Wrap Up

1. Engage with us on social media.

- We're thankful for your word of mouth promotions and endorsements!

2. Share your tough SQL Server SQL tuning problems with us: <http://answers.sqlperformance.com/>

3. Download SQL Sentry Plan Explorer for free: <http://www.sqlsentry.com/plan-explorer/>

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