SQL Server: Indexing for Performance

INTRODUCTION

Kimberly L. Tripp

OWNER/PRESIDENT – SQLSKILLS.COM

@kimberlyltripp   www.sqlskills.com/blogs/kimberly

Module Overview

Definition of indexing for performance

Index uses and types

Course objectives and structure

Indexing for Performance

The complex balance between the science of understanding your data, your workload, and your platform (e.g. SQL Server) and the art of index analysis, usage patterns, and index consolidation

Index Types

Clustered row-based

Clustered column-based

Nonclustered

Index Uses

Supporting a seek

Supporting a scan

Covering a query

Covering multiple queries

Enforcing a constraint

COURSE OBJECTIVE
Provide a thorough understanding of row-based index internals

Evaluate workload characteristics and options related to SQL Server version in order to know what index choices are available

Visualize why certain indexes are more effective by learning how SQL Server uses indexes through different data access patterns

Explain the costs associated with different indexes structures and/or options

Review and analyze the internal structures using a variety of tools and commands to help troubleshoot performance problems

COURSE OBJECTIVE
Provide a thorough understanding of covering indexes

Debunk the myth that having an index on a condition in a WHERE clause is generally a good idea (i.e. show why narrow indexes often go unused)

Understand why wider indexes can be used in a variety of different ways

Explain which features are appropriate for dealing with different query performance problems

Proactively create more useful indexes earlier in your development lifecycle

Provide a thorough understanding of filtered indexes

Very powerful but limited uses

Explain the many requirements from creation to use in client applications to maintenance

Understand how to see when query plans have an unmatched filter index warning and how to resolve them

Basic SQL Server storage concepts

Inside the Storage Engine: Anatomy of a record (http://bit.ly/2rDcsLn)

Inside the Storage Engine: Anatomy of a page (http://bit.ly/2s5WvPf)

Inside the Storage Engine: Proof that records are not always physically stored in index key order (http://bit.ly/2rNmkQY)

Pluralsight course: *SQL Server: Why Physical Database Design Matters*

Course Focus and Structure

- Row-based vs. Column-based Indexes

- Row-based Index Concepts

- Choosing the Clustering Key

- Clustered Index Internals

- Nonclustered Index Internals

Course Focus and Structure

- Data Access Patterns

- Understanding the Tipping Point

- Covering Queries

- Using INCLUDE to Cover Queries

- Understanding Filtered Indexes

- Index Consolidation

What We Covered

Definition of indexing for performance

Index uses and types

Course objectives and structure