Indexing Presentation - The Basics

Attached is the slide deck for a short presentation on indexing that was created to educate software developers on the basics of indexing.

Outline:

- What is an Index
- Types of Indexes
- Non Clustered Indexes
- Clustered Indexes
- When To Avoid A Clustered Index
- Covered Indexes
- Index Usage Terminology
- Summary
- Additional Topics

Download Indexing_Overview.pdf

Here is the text outline of the presentation.

Indexing Overview Presentation

Presented by Steve Stedman

SQL Server Database Consultant

Indexing Overview

- What is an Index
- Types of Indexes
- Non Clustered Indexes
- Clustered Indexes
- When To Avoid A Clustered Index
- Covered Indexes
- Index Usage Terminology
- Summary
- Additional Topics

What is an Index

- Similar to the index at the back of a book.
- An index provides a shortcut to get to your data.
- Without an index to find a specific row in a table, it would required a full table scan.
- Types of Indexes

Two types of indexes in SQL Server

- Non-Clustered Indexes
- Traditional Indexing – contains pointers to the data.
- Clustered Indexes
- Reorganizes the actual data on disk.

Non Clustered Indexes

- Not required, but clustered indexes are recommended
- Contain only the data specified in the index.
- Do not change the base layout of the tables.
- Index structure is separate from the base table.
- Use pointers to get to the data.
- Can be created on most data types including char(), varchar(), and uniqueidentifiers.
- Only one non-clustered index can be used per table reference in a query.
- Can improve performance with multiple columns.

Clustered Indexes

- Causes base table structure to change.
- Only one clustered index per table.
- Not required on a table.
- Should never contain char(), varchar(), varbinary(), uniqueidentifiers, or other large or widely distributed identifiers.
- Can significantly increase the size of a table and the database.
- Can increase performance if used correctly.

When To Avoid A Clustered Index

- If you already have a clustered index on a table you can't create a second one.
- Never use a clustered index on a GUID / UniqueIdentifier

Covered Indexes

- Returns query results without accessing the base table.
- Can lead to major performance increases.
- Applies to Non-Clustered Indexes.

All columns requested in the query are somewhere in the index regardless of :

- Where they are in the query
- Where they are in the index

Index Usage Terminology

- An Index Scan accesses all the rows in the index.
- An Index Seek uses selective rows in the index.
- The Seek is much quicker than the scan.

Summary

- What is an Index
- Types of Indexes
- Non Clustered Indexes
- Clustered Indexes
- When To Avoid A Clustered Index
- Covered Indexes
- Index Usage Terminology
- Summary
- Additional Topics

Additional Topics

- Determining Index Usage
- Indexing for Preformance
- When an Index is not used