Index Consolidation

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Module Overview

Many ways to cover queries

Too many cooks in the kitchen

Index consolidation

Many Ways to Cover Queries

Clustered index always covers
- Only one way to seek or partially scan
- Full scan is most expensive here as it's entire table

Nonclustered indexes can cover a query with narrower rows
- Just the data you need!

Nonclustered indexes with INCLUDE allow you to cover ANY query

Filtered indexes allow you to cover specific sets of data

Indexed views can cover more complicated queries (aggregates, computations, joins) but more for relational data warehousing

Do you need to cover EVERY query? NO!

Too Many Cooks in the Kitchen!

You/colleagues find a query that needs indexes...

A tool finds queries that need indexes...

Missing index DMVs show queries that need indexes...

We think these are helping – indexes are good

But you may end up with a lot of similar indexes

You can create as many useless indexes as you like!

Query Tuning

What index is best for the query?

Only explicitly list columns needed by the query

- Don't add the clustering key just because SQL Server will

- Don't skip explicitly listing clustering key columns because SQL Server will

Determine where they're best placed:

- KEY: for seeking and/or ordering

- INCLUDE: for covering

Index Consolidation for Better Covering

Index structures: key for navigation and INCLUDE for covering

- Must preserve the left-based seeking capability of the key
- Order of included columns is irrelevant

Imagine the following indexes:

- (LastName)
- (LastName, FirstName, MiddleInitial)
- (LastName, FirstName) INCLUDE (Phone)
- (LastName, FirstName) INCLUDE (SSN)

Combine all:

- (LastName, FirstName, MiddleInitial) INCLUDE (Phone, SSN)

Before you create ANY new indexes, review the current indexes!

Demo

Index consolidation

Server Tuning

What index is best
for the server?

Review existing indexes:

- Are there any unused indexes?
- Are there any duplicate indexes?
- Are there any redundant indexes?
- Are there any similar indexes?

Server tuning with indexes is:

- Query tuning and consolidation
  - Reviewing existing indexes
  - Reviewing "missing index" recommendations

Creating the best indexes for your server!

What We Covered

Many ways to cover queries

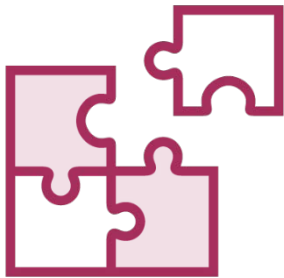**Too many cooks in the kitchen**

Index consolidation

What now?

Are Your Indexing Strategies Working?

Analyze your existing index strategies

Backup / restore to development / test and consider making changes to some of your larger tables

Begin testing, benchmarking, and changing your indexing patterns

Course Summary

Structures, internals, data access patterns, covering, INCLUDE, filters, consolidation

Showed query tuning (science) and indexing strategies for server tuning (art) to create effective indexes to improve performance

Demonstrated how to analyze your query performance and test a variety of possible choices