

# Performance Insights with SQL Server Tools

---



**Jared Westover**

Data Specialist

@westoverjared [sqlhabits.com](http://sqlhabits.com)



## Introduction



### Diminishing returns of query tuning

- Limited troubleshooting time
- Two key areas of focus
- Determine page reads

### Execution plan basics

- Important operators
- Additional resources

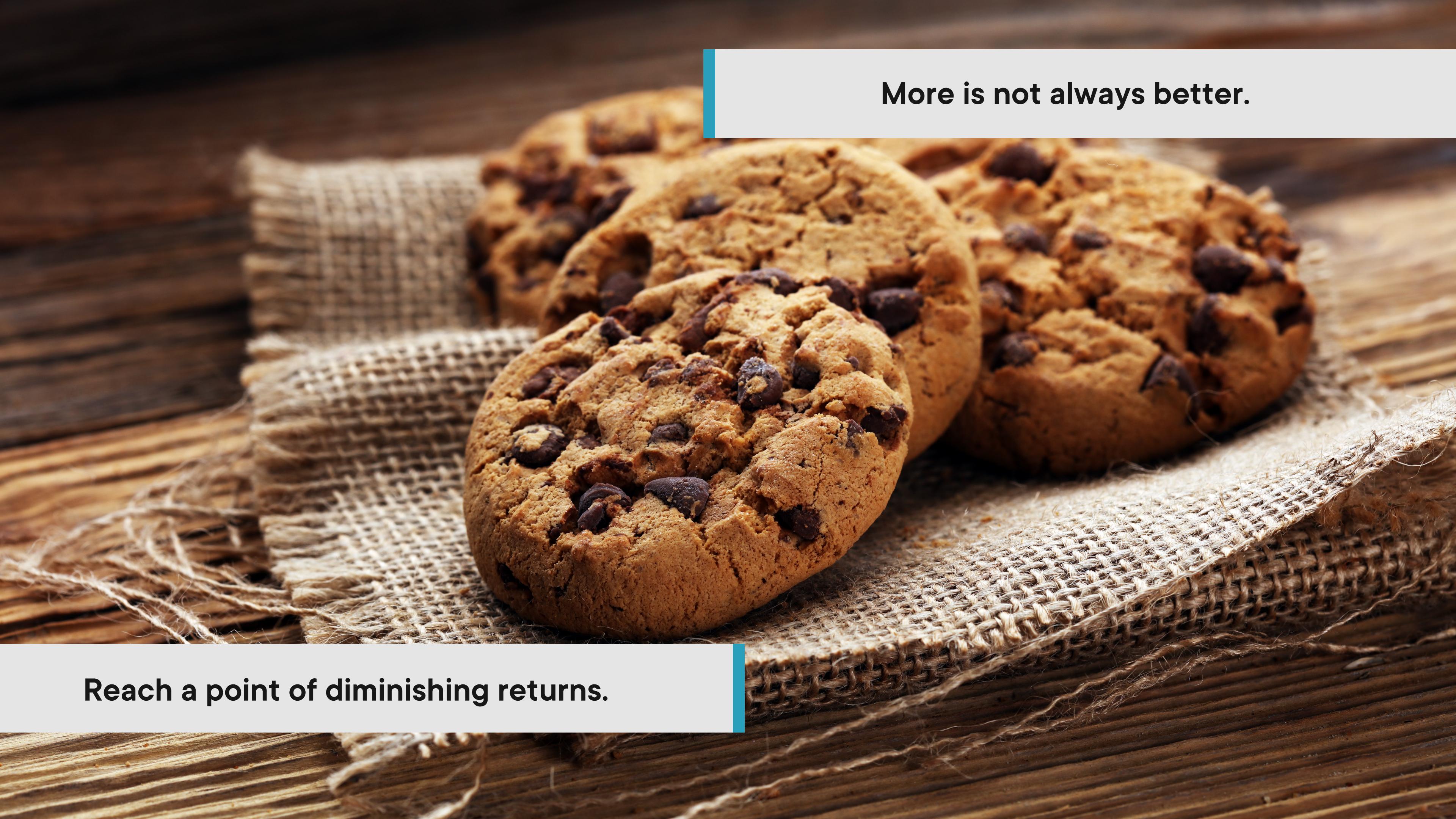
### Performance insights using DMVs

- Use what others have created



A stack of chocolate chip cookies is shown on a rustic wooden surface. The cookies are golden brown with dark chocolate chips. They are resting on a piece of burlap. A vertical teal bar is positioned to the left of the text.

**More is not always better.**

A stack of chocolate chip cookies is shown on a rustic wooden surface. The cookies are golden brown with dark chocolate chips. They are resting on a piece of burlap. A vertical teal bar is positioned to the right of the text.

**Reach a point of diminishing returns.**



**Where should you focus your time?**

**Low-hanging fruit**

**Table size**

- Larger table means more work
- Width of the table

**Large tables have more pages**

- Limit page reads
- Proper indexes in place



# Calculate Page Reads

---





**How do you calculate page count?**

**Speed isn't always the best measure**

**Built-in tool: STATISTICS IO**

**Logical reads**

- Reading from cache

**Physical reads**

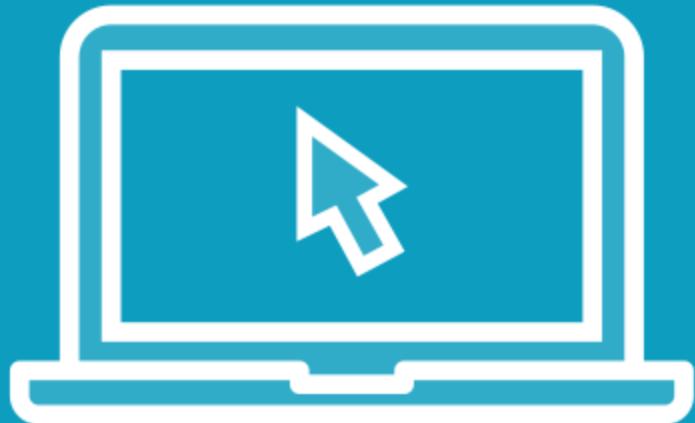
- Reading from disk

**LOB reads**

- Over 8000 bytes



Demo



**Explore STATISTICS IO data points**  
**Proper indexes return fewer pages**



# Execution Plan Basics

---



# Execution Plan

**A tool used for displaying the data retrieval methods chosen by the SQL Server Query Optimizer.**





**Blueprint of query execution**

**Data flow story**

**Logical join operators**

- Inner, left, & cross apply

**Physical joins**

- Nested loops, merge, & hash

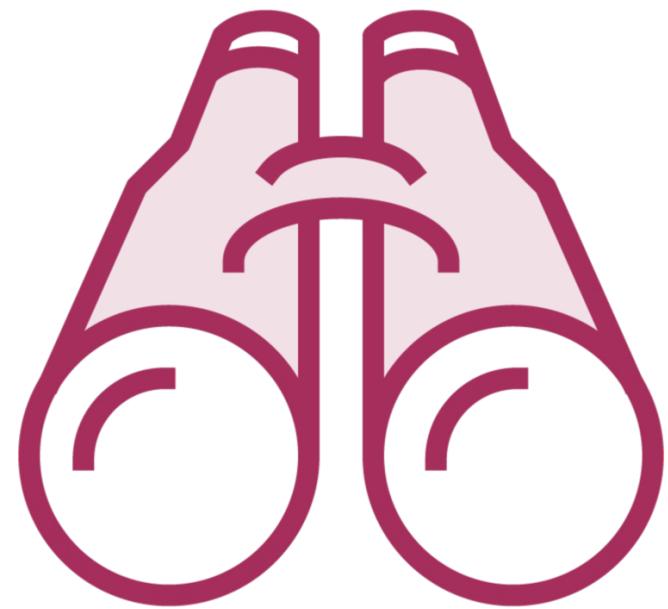
**Estimate vs. actual**

**Compare cost of two queries**

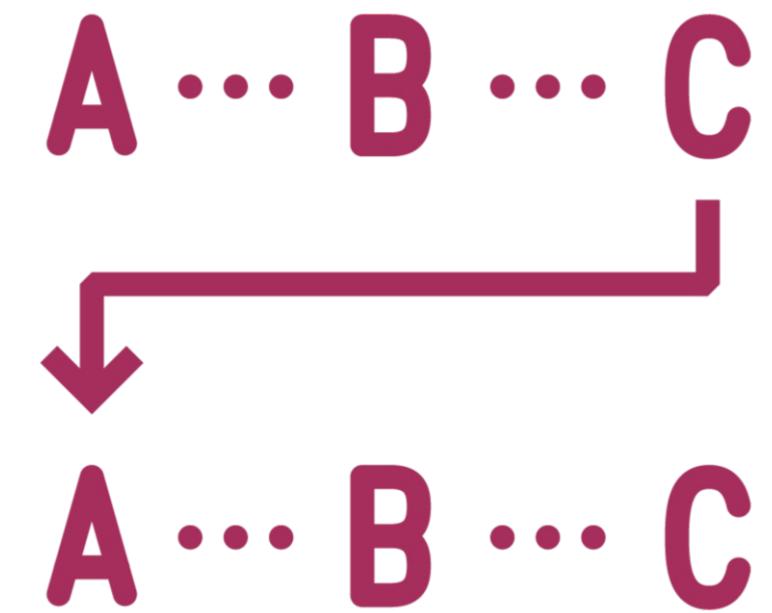
**Lowest cost plan usually wins**



# Important Plan Operators



**Seek & scan**  
Performs a scan or seek of table or index



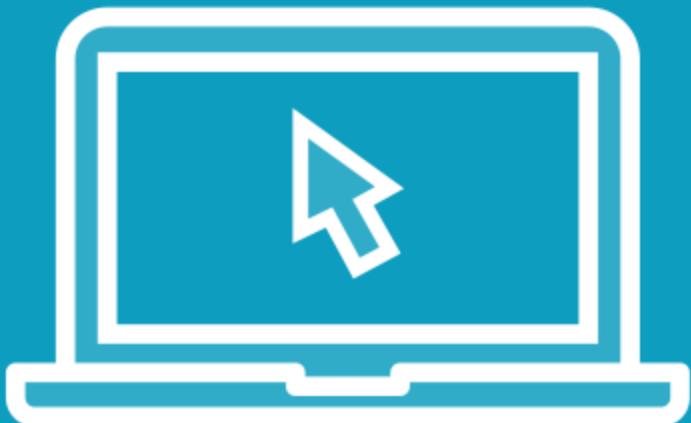
**Sort**  
Ascending or descending order



**Lookup**  
Columns missing from the index



Demo

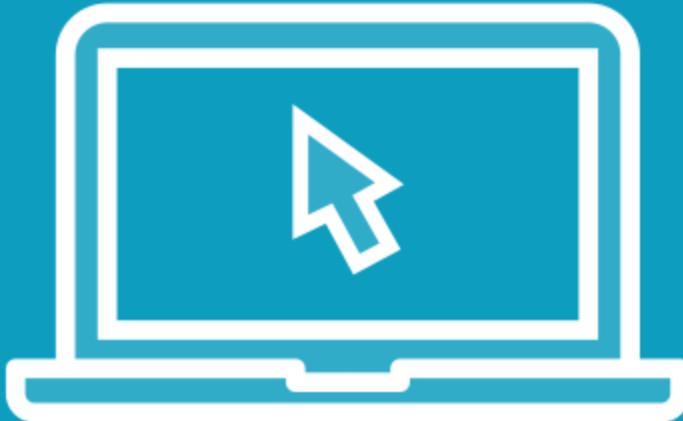


## Exploring an execution plan

- Actual versus estimate plan



Demo



## Highlight important plan operators

- Additional resources





# **Informative Pluralsight Course**

## **SQL Server: Analyzing Query Performance for Developers**

**Erin Stellato**



# Dynamic Management Objects

---



# Dynamic Management View

**Dynamic management views and functions return server state information that can be used to monitor the health of a server instance, diagnose problems, and tune performance.**





## DMOs act as SQL health markers

- Views and functions
- Combine multiple DMVs

## Discover missing indexes

- Don't create an index for every column
- Indexes add overhead and maintenance

## Find queries reading a lot of pages





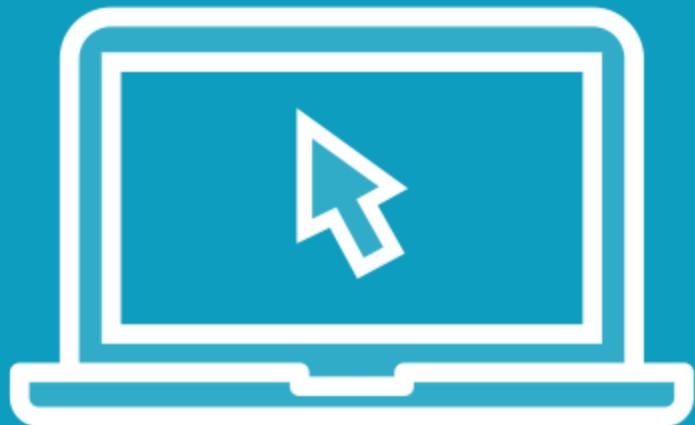
# **Informative Pluralsight Course**

## **SQL Server 2017: Diagnosing Performance Issues with DMVs**

Glenn Berry



Demo



**Find missing indexes**  
**Queries reading the most pages**



## Summary



### Diminishing returns of query tuning

- Where to focus your time

### Table size & page reads

### STATISTICS IO displays page reads

### Introduced execution plans

- Common operators

### Dynamic management objects

- Find missing indexes



Up Next:  
Query Tuning in the Real World

---

