SQL Server Execution Plan Guide

A guide to the terminology commonly found in an Execution Plan for SQL Server, what they mean, and why they are used.

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In this guide, you're going to learn more about the Execution Plan in SQL Server.

This guide includes:

- how to view an Explain Plan or Execution Plan in SQL Server.
- a list of many of the common access methods and join methods
- what the methods mean
- why the database would use each of these methods

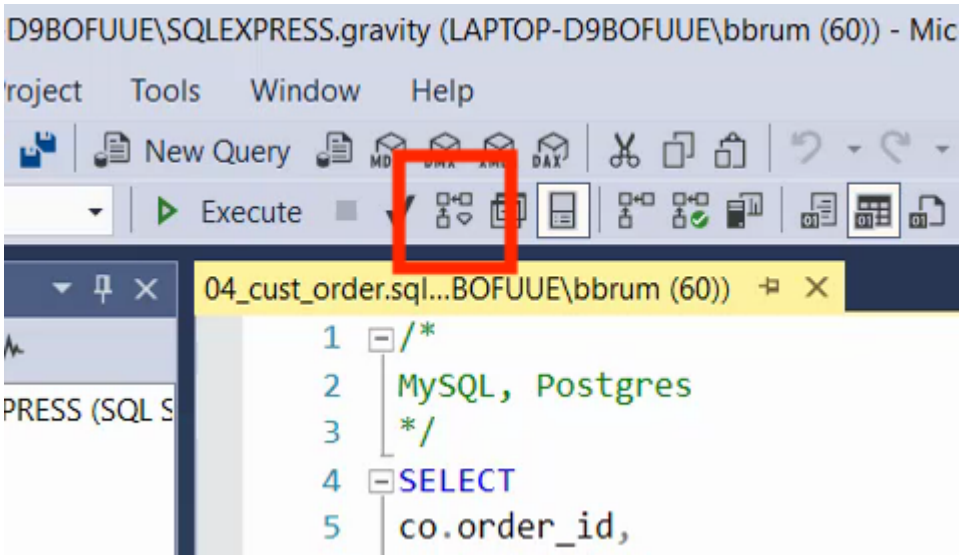
Understanding the terms in the Execution Plan is the first step in understanding how your query is executed and what you can do to improve its performance.

Let's get right into it.

How to View an Execution Plan

Here's how you can view an Execution Plan in Postgres using SSMS. If you use a different SQL editor, you'll likely see a similar button on the toolbar or in the menu.

Click Display Estimated Execution Plan



The Execution Plan will be shown on the bottom of the screen.

Access Methods

These steps are used by the database to access data from a table or an index.

Name	Definition	When It Is Used
Index Scan	This will read the entire index in order. Used for non-clustered indexes.	When an Index Seek can't be used
Clustered Index Scan	This will read the entire index in order. Used for clustered indexes.	When an Index Seek can't be used
Index Seek	This will perform a B-tree traversal and find matching rows. Used for non-clustered indexes.	When the matching rows can be found without reading the entire index
Clustered Index Seek	This will perform a B-tree traversal and find matching rows. Used for clustered indexes.	When the matching rows can be found without reading the entire index
RID Lookup	This will find a single row from a table. Similar to Oracle's Table Access by Index Rowid.	Used when the data is stored in a heap (as opposed to a B-tree)
Table Scan	This will read all rows and columns in the table. Also called a Full Table Scan. It's an expensive operation.	No indexes are available to be used.

Join Operations

These steps are used by the database to combine two sets of results and return a single set of results.

Name	Definition	When It Is Used
Nested Loops	Compares each row of one result with each row of another, and returns a single result	Generally used for large data sets, or where one table is much larger than the other
Hash Match	Joins two sets of results in memory and returns a single result	Generally used for small data sets or when the results can fit in memory
Merge Join	Compares two sets of results, each of which are sorted, and returns the combined result	Used when the columns in the two result sets have indexes

Sort Operations

These steps are used by the database to sort a set of results for display or further processing.

Name	Definition	When It Is Used
Sort	Sorts the result of your query using the ORDER BY clause.	When an Order By is used or when the following step requires the data in order.