

Oracle Execution Plan Guide

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

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

This guide includes:

- how to view an Explain Plan or Execution Plan in Oracle
- 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 understand how your query is executed and what you can do to improve its performance.

Let's get right into it.

Access Methods

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

Name	Definition	When It Is Used
Table Access Full (or Full Table Scan)	Read every row in the table	No indexes on the table.
Table Access By ROWID Range	Read table rows based on a range of ROWIDs	The multiple ROWIDs are specified in a WHERE clause or from an index
Table Access By User ROWID	Read rows from the table if the user has provided the ROWID	The ROWID is provided from a WHERE clause
Table Access By Index ROWID	Read rows from the table if the index has provided the ROWID	The ROWID is provided from an index scan step
Index Unique Scan	Gets a single ROWID from an index.	A WHERE clause or join matches to a single row and there is a primary key constraint
Index Range Scan	Gets one or more values from an index	A WHERE clause or join condition looks for a range of values on a unique index, or it looks for a single value on a non-unique index
Index Skip Scan	Gets ROWIDs from a concatenated index without using the leading column	An index has multiple columns, and all columns except the first/leading column are in the query
Index Full Scan	Gets all ROWIDs from an index	All columns that we need are in the index, and the Order By matches the order of the columns in the index
Index Fast Full Scan	Gets all ROWIDs and column values from an index	All columns that we need are in the index, and it can replace a Full Table Scan
Index Join	Looks at data from two indexes and combines them	A table has many columns, with multiple indexes, and all of the columns in the query are included in the multiple indexes

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 Join	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 Aggregate	Gets a single row after applying an aggregate function	An aggregate function is used, such as MAX or COUNT
Sort Unique	Sorts a set of rows to eliminate duplicates	The query includes a DISTINCT keyword
Sort Group By	Sorts rows into groups as part of a Group By clause	The query contains a Group by clause
Sort Order By	Sorts rows into groups as part of a Order By clause	The query contains an Order By clause