

SQL SERVER Performance Tuning Notes

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What are the internal methods of Physical Operators? How they work?

All the operators present in the execution plan are physical operators. We can see the physical operation by hovering over each operator in the execution plan.

SELECT TOP 5 * FROM [dbo].[EmpNames]
UNION ALL
SELECT TOP 5 * FROM [dbo].[EmpNames]

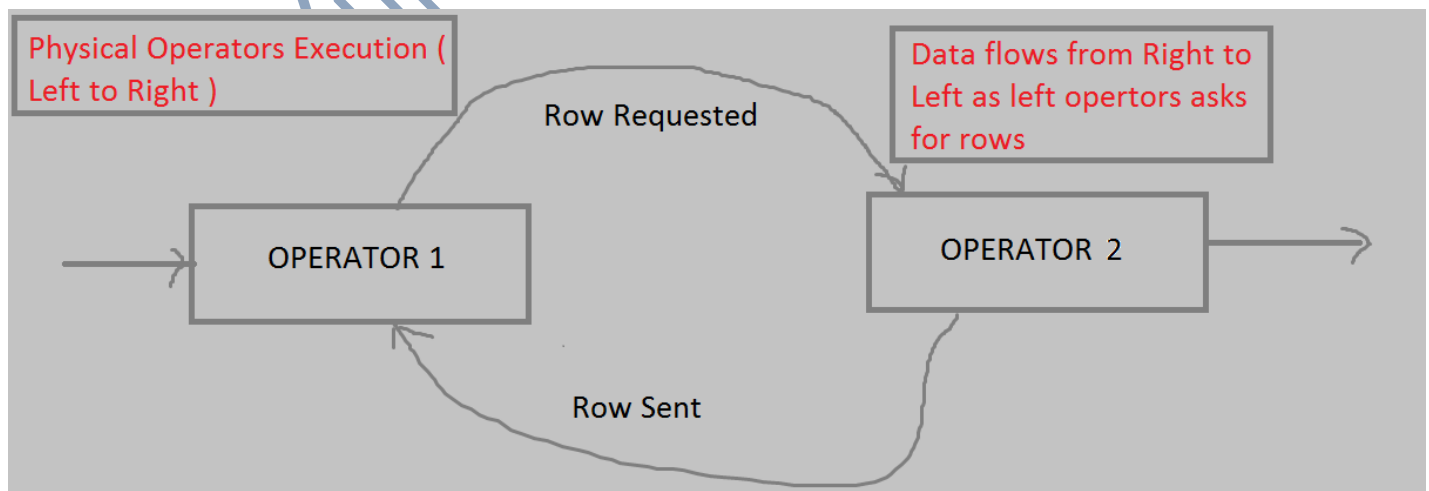
Query 1: Query cost (relative to the batch): 100%
SELECT TOP 5 * FROM [dbo].[EmpNames] UNION ALL SELECT T

| Concatenation | |
|--|---------------|
| Append multiple input tables to form the output table. | |
| Physical Operation | Concatenation |
| Logical Operation | Concatenation |
| Actual Execution Mode | Row |
| Estimated Execution Mode | Row |
| Actual Number of Rows | 10 |
| Actual Number of Batches | 0 |
| Estimated Operator Cost | 0.000001 (0%) |
| Estimated I/O Cost | 0 |
| Estimated Subtree Cost | 0.006577 |
| Estimated CPU Cost | 0.000001 |
| Number of Executions | 1 |
| Estimated Number of Executions | 1 |
| Estimated Number of Rows | 10 |
| Estimated Row Size | 20 B |
| Actual Rewinds | 0 |
| Actual Rewinds | 0 |
| Node ID | 0 |
| Output List | |
| Union1006, Union1007 | |

Picture 2

Picture showing physical operators. In this specific execution plan we have some operators like concatenation, table scan etc. If you hover over the operator you will see logical and physical operation like in picture 2

Picture above showing example of physical operators in an execution plan



For example- Picture showing how each operator requests rows and how rows are returned. Please note that each operator asks for a row one at a time. So works like one record come at a time and goes out at a time.

All operators used in execution plans, implement three methods. They are

1. Init()
2. GetNext()
3. Close()

Init() method-

This is the first method for each physical operator. It does following steps.

- a. It initializes the physical operator.
- b. It sets up the required data structures.
- c. Some operators can receive more than one input, so, these inputs will be processed at the Init() method. The concatenation is one example of these operators.

GenNext() method-

- a. This operator requests next record
- b. It can have zero or more rows
- c. It is responsible for setting Actual Rows property in the execution plan

Example below-

| Table Scan | |
|---|-----------------|
| Scan rows from a table. | |
| Physical Operation | Table Scan |
| Logical Operation | Table Scan |
| Actual Execution Mode | Row |
| Estimated Execution Mode | Row |
| Storage | RowStore |
| Actual Number of Rows | 5 |
| Estimated Number of Rows | 5 |
| Estimated I/O Cost | 0.003125 |
| Estimated Operator Cost | 0.0032875 (50%) |
| Estimated CPU Cost | 0.0002736 |
| Estimated Subtree Cost | 0.0032875 |
| Number of Executions | 1 |
| Estimated Number of Executions | 1 |
| Estimated Number of Rows | 5 |
| Estimated Row Size | 20 B |
| Actual Rebinds | 0 |
| Actual Rewinds | 0 |
| Ordered | False |
| Node ID | 2 |
| Object | |
| [AdventureWorks2012].[dbo].[EmpNames] | |
| Output List | |
| [AdventureWorks2012].[dbo].[EmpNames].Id, [AdventureWorks2012].[dbo].[EmpNames].Name | |

Close() method-

- a. It is called once for each physical operator. It cleans up the things and shut down the operator.

Summary

So all in all what we have each operator asks for a row from his next operator and sucks it through. It works from left to right and the data flows from right to left.

That's all folks; I hope you've enjoyed learning about physical operators and their internal emthods, and I'll see you soon with more "Performance Tuning" articles.

Thanks!

Pawan Kumar Khowal

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