

Parallelism

ISM 6218

Due on September 17

The Avengers Team

“We will avenge every problem on our way”

Aitemir Yeskenov (Team Lead)

Nagarjuna Kanneganti

Sai Suraj Argula

Vinay Kumar Reddy Baradi

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Business Process Supported

We have created the Employee database to analyze the performance results of the queries with different degrees of parallelism. The database consists of one table - **EmployeeDetails** table.

Requirements Described

- Run a series of queries with different degrees of parallelism.
- Report your performance results.

Database Diagram

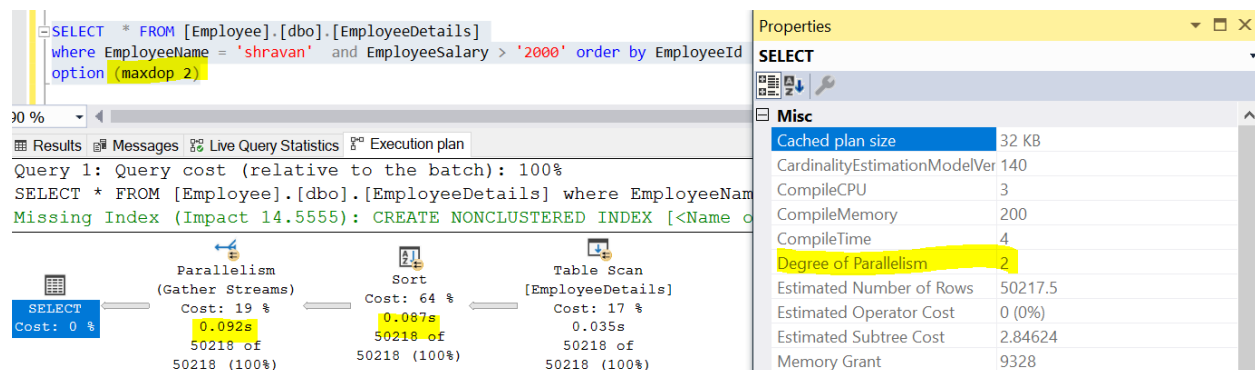
| EmployeeDetails | |
|-----------------|-----------------|
| | EmployeeId |
| | EmployeeName |
| | EmployeeAddress |
| | EmployeeEmailId |
| | EmployeePhoneNo |
| | EmployeeSalary |
| | |

User Story :

We have created the **EmployeeDetails** table with **EmployedId, EmployeeName, EmployeeAddress, EmployeePhoneNo., EmployeeEmailId, EmployeeSalary** columns. Then we ran the SELECT queries to return the records that contains the attributes 'shravan' and also having the 'employeesalary' greater than '2000'. We ran the queries using the degree of parallelism(DOP) as **2,4,8** respectively. We have set the **Cost Threshold for Parallelism** value to 0, to make sure that in all cases the query cost will exceed the Cost Threshold for Parallelism value

MAXDOP 2

We ran the below query with DOP as 2 to limit the number of processors used. we noticed that the processing time for parallelism and sorting is **0.092s** and **0.087s** respectively.



MAXDOP 4

We have run the below query using the degree of parallelism as 4 and observed that the time is less than that of DOP 2. we noticed that the processing time for parallelism and sorting is **0.092s** and **0.087s** respectively.

SQL Query:

```
SELECT * FROM [Employee].[dbo].[EmployeeDetails]
where EmployeeName = 'shravan' and EmployeeSalary > '2000' order by EmployeeId
option (maxdop 4)
```

Query 1: Query cost (relative to the batch): 100%

Missing Index (Impact 21.7715): CREATE NONCLUSTERED INDEX [Name of

Execution Plan:

- SELECT (Cost: 0%)
- Parallelism (Gather Streams) (Cost: 23%)
 - 0.081s
 - 50218 of 50218 (100%)
- Sort (Cost: 51%)
 - 0.069s
 - 50218 of 50218 (100%)
- Table Scan [EmployeeDetails] (Cost: 26%)
 - 0.030s
 - 50218 of 50218 (100%)

Properties:

| SELECT | |
|-------------------------------|---------|
| Misc | |
| Cached plan size | 32 KB |
| CardinalityEstimationModelVer | 140 |
| CompileCPU | 8 |
| CompileMemory | 200 |
| CompileTime | 13 |
| Degree of Parallelism | 4 |
| Estimated Number of Rows | 50217.5 |
| Estimated Operator Cost | 0 (0%) |
| Estimated Subtree Cost | 1.78859 |
| Memory Grant | 10560 |

MAXDOP 8

Now in this query, we have increased the DOP to 8 and noticed that parallelism and sorting time is less than compared to the DOP 2 and 4 which is **0.092s** and **0.087s**.

SQL Query:

```
SELECT * FROM [Employee].[dbo].[EmployeeDetails]
where EmployeeName = 'shravan' and EmployeeSalary > '2000' order by EmployeeId
option (maxdop 8)
```

Query 1: Query cost (relative to the batch): 100%

Missing Index (Impact 21.7715): CREATE NONCLUSTERED INDEX [Name of

Execution Plan:

- SELECT (Cost: 0%)
- Parallelism (Gather Streams) (Cost: 23%)
 - 0.060s
 - 50218 of 50218 (100%)
- Sort (Cost: 51%)
 - 0.039s
 - 50218 of 50218 (100%)
- Table Scan [EmployeeDetails] (Cost: 26%)
 - 0.012s
 - 50218 of 50218 (100%)

Properties:

| SELECT | |
|-------------------------------|---------|
| Misc | |
| Cached plan size | 32 KB |
| CardinalityEstimationModelVer | 140 |
| CompileCPU | 10 |
| CompileMemory | 200 |
| CompileTime | 12 |
| Degree of Parallelism | 8 |
| Estimated Number of Rows | 50217.5 |
| Estimated Operator Cost | 0 (0%) |
| Estimated Subtree Cost | 1.78859 |
| Memory Grant | 12992 |
| MemoryGrantInfo | |