SQL Server 2012: Nonclustered Columnstore Indexes

Module 4: Benefiting from Segment Elimination

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Module Introduction

- A segment is the unit of transfer for nonclustered columnstore index queries
- In some scenarios, the SQL Server Query Optimizer can evaluate your predicates and determine whether or not one or more segments can be bypassed entirely (segment elimination), reducing I/O and minimizing memory usage
- This module will cover how to benefit from segment elimination

Segment Elimination (1)

- **A segment has a min/max value for the contained values**
  - This metadata can be used for additional “elimination” based on query predicates (skipping segments that don’t fall into the range)

- **Segment elimination events are visible via:**
  - sqlserver.column_store_segment_eliminate Extended Event event
  - Trace flag 646 to output events to the SQL Server error log

Segment Elimination (2)

```
SELECT  p.[ProductLine],
        SUM(f.[SalesAmount]) AS [TotalSalesAmount]
FROM    [dbo].[FactInternetSales] AS
INNER JOIN [dbo].[DimProduct] AS p
        ON f.[ProductKey] = p.[ProductKey]
WHERE f.[ProductKey] BETWEEN 580 AND 606
GROUP BY p.[ProductLine]
ORDER BY p.[ProductLine];
```

Query predicates can drive additional performance benefits

Segment Elimination (3)

```
SELECT   [segment_id],
         [row_count],
         [min_data_id],
         [max_data_id]
FROM     sys.column_store_segments
WHERE    [column_id] = 1 AND
         [partition_id] = 72057594042712064 AND
         [min_data_id] >= 580;
```

	segment_id	row_count	min_data_id	max_data_id
1	122	36841	599	599
2	123	413499	584	606
3	124	568140	584	606
4	125	567138	583	606
5	126	706195	581	606
6	127	668813	582	606
7	128	723196	583	606
8	129	834620	580	606

8 segments out of 13