OPUS

Query Optimization Documentation

Things I can utilize:

* Selection on specific fields
* Selection on specific rows
* Avoiding select distinct if not needed
* Creating joins with inner joins instead of where
* Using where instead of HAVING
* Using limit to sample query results

Query 1

Company/News

The following query is being used to fetch the recent news of the specified company and its peers from the database. We highlight how the optimizations result in a speed up.

Unoptimized:

WITH Temp AS (  
 WITH T1 AS (SELECT DISTINCT peerID, "PEER" as cmpRel  
 FROM Peers  
 WHERE symbol LIKE '%A%'  
 UNION ALL  
 SELECT DISTINCT peerID, "SELF" as cmpRel  
 FROM Peers  
 WHERE peerID LIKE '%A%'  
 )  
 SELECT \*  
 FROM CompanyNews CN, T1  
 WHERE CN.symbol = T1.peerID)  
 SELECT \*  
 FROM Temp  
 ORDER BY publishedDate DESC;

* Execution Time: 15s 705ms

Optimized:

WITH Temp AS (  
 WITH T1 AS (SELECT DISTINCT peerID, "PEER" as cmpRel  
 FROM Peers  
 WHERE symbol LIKE 'A'  
 UNION ALL  
 SELECT DISTINCT peerID, "SELF" as cmpRel  
 FROM Peers  
 WHERE peerID LIKE 'A'  
 )  
 SELECT symbol,  
 publishedDate,  
 title,  
 image,  
 site,  
 text,  
 cmpRel,  
 url  
 FROM CompanyNews CN JOIN T1 ON CN.symbol = T1.peerID)  
 SELECT symbol,  
 publishedDate,  
 title,  
 image,  
 site,  
 text,  
 cmpRel,  
 url  
 FROM Temp  
 WHERE title IS NOT NULL  
 ORDER BY publishedDate DESC  
 LIMIT ${offset}, ${pagesize};

* Execution Time: 859 ms

Optimizations Made:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SNo | Type of Optimization | Unoptimized Query | Optimized Query | Implication |
| 1 | **SELECT** | All fields (SELECT \*) are being retrieved in both the CTE expression and the final SELECT call. The fields are being filtered via JavaScript NodeJS. | Only fields needed by subsequent queries are retrieved in CTEs and fields to be displayed on the Front End are projected in the main SELECT call. | Project on Specific Fields |
| 2 | **WHERE** | No selection condition to filter the number of rows in the final result. | Selection condition in WHERE clause to filter out rows with erroneous News Title. | Selection on specific rows |
| 3 | **INNER JOIN vs**  **CARTESIAN CROSS PRODUCT** | Cross product with Where clause to filter out relevant rows after the execution of Join. Results in more comparisons to join tables. | Inner Join with the Join condition specified on Primary Key – Foreign Key. Results in filtering of tables on join condition before the execution of join and thereby significantly lesser number of comparisons to be made. | Creating joins with inner joins instead of where |
| 4 | **LIMIT** | All the results in the final table are retrieved by the server and pagination done on FrontEnd. | LIMIT implemented to enforce pagination at database level. Results in only the data required to be displayed at the front end to be queried from the database. Consequently a smaller size of the data is sent to the server. | Using limit to sample query results |
| 5 | **INDEX** |  |  | As joins are made on Primary Key – Foreign Keys the attributes are already indexed and no new indexes are created. |
| 6 | **Wildcard Optimization ‘%’** |  |  |  |
|  | **Execution Time** | 15s 705ms | 859 ms |  |
|  | Speed Improvement – 18.2x | | | |

* Bullet points