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## **Using Indexes for Query Optimization**

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In Oracle NoSQL Database, the query processor can identify which of the available indexes are beneficial for a query to make use of such an index. "Using" an index means scanning a contiguous subrange of its entries, pote further filtering conditions on the entries within this subrange, and using the primary keys stored in the surviving extract and return the associated table rows. The subrange of the index entries to scan is determined by the conthe WHERE clause, some of which may be converted to search conditions for the index. Given that only a (hopefithe index entries will satisfy the search conditions, the query can be evaluated without accessing each individual saving a potentially large number of disk accesses.

Notice that in Oracle NoSQL Database, a primary-key index is always created by default. This index maps the prin of a table to the physical location of the table rows. Furthermore, if no other index is available, the primary index other words, there is no pure "table scan" mechanism; a table scan is equivalent to a scan via the primary-key inc

When it comes to indexes and queries, the query processor must answer two questions:

- 1. Is an index applicable to a query? That is, will accessing the table via this index be more efficient than doing scan (via the primary index).
- 2. Among the applicable indexes, which index or combination of indexes is the best to use?

Regarding question (1), for queries with NESTED TABLES, secondary indexes will be considered for the target tal current implementation, ancestor and/or descendant tables will always be accessed via their primary index.

Regarding question (2), the current implementation does not support index anding or index oring. As a result, the will always use exactly one index (which may be the primary-key index). Furthermore, there are no statistics on the distribution of values in a table column or nested fields. As a result, the query processor has to rely on some simple choosing among the applicable indexes. In addition, SQL for Oracle NoSQL Database allows for the inclusion of inqueries, which are used as user instructions to the query processor about which index to use.

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