Clustered and Nonclustered Indexes Described

An index is an on-disk structure associated with a table or view that speeds retrieval of rows from the table or view. An index contains keys built from one or more columns in the table or view. These keys are stored in a structure (B-tree) that enables SQL Server to find the row or rows associated with the key values quickly and efficiently.

A table or view can contain the following types of indexes:

* Clustered
  + Clustered indexes sort and store the data rows in the table or view based on their key values. These are the columns included in the index definition. There can be only one clustered index per table, because the data rows themselves can be sorted in only one order.
  + The only time the data rows in a table are stored in sorted order is when the table contains a clustered index. When a table has a clustered index, the table is called a clustered table. If a table has no clustered index, its data rows are stored in an unordered structure called a heap.
* Nonclustered
  + Nonclustered indexes have a structure separate from the data rows. A nonclustered index contains the nonclustered index key values and each key value entry has a pointer to the data row that contains the key value.
  + The pointer from an index row in a nonclustered index to a data row is called a row locator. The structure of the row locator depends on whether the data pages are stored in a heap or a clustered table. For a heap, a row locator is a pointer to the row. For a clustered table, the row locator is the clustered index key.
  + You can add nonkey columns to the leaf level of the nonclustered index to by-pass existing index key limits, 900 bytes and 16 key columns, and execute fully covered, indexed, queries.

Both clustered and nonclustered indexes can be unique. This means no two rows can have the same value for the index key. Otherwise, the index is not unique and multiple rows can share the same key value.

Indexes are automatically maintained for a table or view whenever the table data is modified.