MySQL Index

Database

Index

- A database index is a data structure that improves the speed of operations in a table.
- Indexes can be created using one or more columns, providing the basis for both rapid random lookups and efficient ordering of access to records.
- While creating index, it should be taken into consideration which all columns will be used to make SQL queries and create one or more indexes on those columns.

INDEX (CONT.)

- Practically, indexes are also a type of tables, which keep primary key or index field and a pointer to each record into the actual table.
- The users cannot see the indexes, they are just used to speed up queries and will be used by the Database Search Engine to locate records very fast.
- The INSERT and UPDATE statements take more time on tables having indexes, whereas the SELECT statements become fast on those tables. The reason is that while doing insert or update, a database needs to insert or update the index values as well.

Creating index

- Creating index when creating the table
- Creating index using alter table command
- Creating index using create index command

Index using create table

- CREATE TABLE products(

```
prod_ID int unsigned auto_increment,
prod_name varchar(20) not null,
prod_category varchar(30) not null,
prod_price float(5,2) not null,
prod_desc varchar(200),
Primary key (prod_ID),
Index idx_pname (prod_name)
);
```

Creating index using alter table command

- ALTER TABLE products
  ADD INDEX idx_pcat (prod_category);

INDEX USING CREATE INDEX COMMAND

- CREATE INDEX idx_cat ON products(prod_name, prod_category);

Drop index

- DROP INDEX index_name ON table_name;
- DROP INDEX idx_pcat ON products;

Showing index

- SHOW INDEX FROM table_name;
- SHOW INDEX FROM products ;
- SHOW INDEX FROM products \G;

Show each row details together one after another

Full Create Index Syntax

CREATE [UNIQUE | FULLTEXT | SPATIAL] INDEX *index_name*
[*index_type*]
ON *tbl_name* (*key_part*,...)
[*index_option*]
[*algorithm_option* | *lock_option*] ...
key_part:
col_name [(*length*)] [ASC | DESC]
index_option: KEY_BLOCK_SIZE [=] *value*
| *index_type* | WITH PARSER *parser_name*
| COMMENT '*string*'
index_type: USING {BTREE | HASH}
algorithm_option: ALGORITHM [=] {DEFAULT | INPLACE | COPY}
lock_option:
LOCK [=] {DEFAULT | NONE | SHARED | EXCLUSIVE}

Storage Engine and index types

Storage Engine	Permissible Index Types
InnoDB	BTREE
MyISAM	BTREE
MEMORY/HEAP	HASH, BTREE
NDB	HASH, BTREE

To check query execution time

- Concept of profiling can be used
- Following steps can be followed

Set profiling to 1
Then execute query
Then show profiles

- SET profiling = 1;
- SELECT * FROM products;
- SHOW PROFILES;