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MySQL Triggers Implementation

Summary: in this tutorial, you will learn about **MySQL triggers implementation**. In addition, we will show you how MySQL stores trigger definitions and the limitations of triggers in MySQL.

Introduction to MySQL triggers

In MySQL, a trigger is a set of SQL statements that is invoked automatically when a change is made to the data on the associated table. A trigger can be defined to be invoked either

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before or after the data is changed by INSERT, UPDATE or DELETE statement. Before MySQL version 5.7.2, you can to define maximum six triggers for each table.

- `BEFORE INSERT` – activated before data is inserted into the table.
- `AFTER INSERT` – activated after data is inserted into the table.
- `BEFORE UPDATE` – activated before data in the table is updated.
- `AFTER UPDATE` – activated after data in the table is updated.
- `BEFORE DELETE` – activated before data is removed from the table.
- `AFTER DELETE` – activated after data is removed from the table.

However, from MySQL version 5.7.2+, you can define multiple triggers for the same trigger event and action time.

When you use a statement that makes changes to the table but does not use `INSERT`, `DELETE` or `UPDATE` statement, the trigger is not invoked. For example, the TRUNCATE statement removes the whole data of a table but does not invoke the trigger associated with that table.

There are some statements that use the `INSERT` statement behind the scenes such as `REPLACE` statement and LOAD DATA statement. If you use these statements, the corresponding triggers associated with the tables will be invoked.

Triggers defined for a table must have a unique name. You can have the same trigger name that defines for different tables but it is not recommended. In practice, the names of triggers follow the following naming convention:

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```
(BEFORE | AFTER)_tableName_(INSERT| UPDATE | DELETE)
```

MySQL Triggers Storage

MySQL stores triggers in a data directory e.g., `/data/classicmodels/` with the files named `tablename.TRG` and `triggername.TRN` :

- The `tablename.TRG` file maps the trigger to the corresponding table.
- the `triggername.TRN` file contains the trigger definition.

You can back up the MySQL triggers by copying the trigger files to the backup folder. You can also backup the triggers using the *mysqldump* tool.

MySQL Trigger Limitations

MySQL triggers cover all features defined in the standard SQL. However, there are some limitations that you should know before using them in your applications.

MySQL triggers cannot:

- Use `SHOW` , `LOAD DATA` , `LOAD TABLE` , `BACKUP DATABASE,` `RESTORE` , `FLUSH` and `RETURN` statements.
- Use statements that commit or rollback implicitly or explicitly such as `COMMIT` , `ROLLBACK` , `START TRANSACTION` , `LOCK/UNLOCK TABLES` , `ALTER` , `CREATE` , `DROP` , `RENAME` , etc.
- Use prepared statements such as `PREPARE` , `EXECUTE` , etc.
- Use dynamic SQL statements.

From MySQL version 5.1.4, a trigger can call a stored procedure or stored function, which was a limitation is the previous versions.

In this tutorial, we have shown you how triggers are implemented in MySQL. We also discussed about trigger's storage as well as trigger's limitations in MySQL.

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