Introduction to SQL Server CREATE TRIGGER statement

The CREATE TRIGGER statement allows you to create a new trigger that is fired automatically whenever an event such as [INSERT](https://www.sqlservertutorial.net/sql-server-basics/sql-server-insert/), [DELETE](https://www.sqlservertutorial.net/sql-server-basics/sql-server-delete/), or [UPDATE](https://www.sqlservertutorial.net/sql-server-basics/sql-server-update/) occurs against a table.

The following illustrates the syntax of the CREATE TRIGGER statement:

CREATE TRIGGER [schema\_name.]trigger\_name

ON table\_name

AFTER {[INSERT],[UPDATE],[DELETE]}

[NOT FOR REPLICATION]

AS

{sql\_statements}

Code language: SQL (Structured Query Language) (sql)

In this syntax:

* The schema\_name is the name of the schema to which the new trigger belongs. The schema name is optional.
* The trigger\_name is the user-defined name for the new trigger.
* The table\_name is the table to which the trigger applies.
* The event is listed in the AFTER clause. The event could be INSERT, UPDATE, or DELETE. A single trigger can fire in response to one or more actions against the table.
* The NOT FOR REPLICATION option instructs SQL Server not to fire the trigger when data modification is made as part of a replication process.
* The sql\_statements is one or more Transact-SQL used to carry out actions once an event occurs.

“Virtual” tables for triggers: INSERTED and DELETED

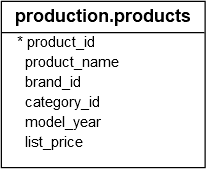
SQL Server provides two virtual tables that are available specifically for triggers called INSERTED and DELETED tables. SQL Server uses these tables to capture the data of the modified row before and after the event occurs.

The following table shows the content of the INSERTED and DELETED tables before and after each event:

| **DML event** | **INSERTED table holds** | **DELETED table holds** |
| --- | --- | --- |
| INSERT | rows to be inserted | empty |
| UPDATE | new rows modified by the update | existing rows modified by the update |
| DELETE | empty | rows to be deleted |

SQL Server CREATE TRIGGER example

Let’s look at an example of creating a new trigger. We will use the production.products table from the sample database for the demonstration.



1) Create a table for logging the changes

The following statement [creates a table](https://www.sqlservertutorial.net/sql-server-basics/sql-server-create-table/) named production.product\_audits to record information when an INSERT or DELETE event occurs against the production.products table:

CREATE TABLE production.product\_audits(

change\_id INT IDENTITY PRIMARY KEY,

product\_id INT NOT NULL,

product\_name VARCHAR(255) NOT NULL,

brand\_id INT NOT NULL,

category\_id INT NOT NULL,

model\_year SMALLINT NOT NULL,

list\_price DEC(10,2) NOT NULL,

updated\_at DATETIME NOT NULL,

operation CHAR(3) NOT NULL,

CHECK(operation = 'INS' or operation='DEL')

);

Code language: SQL (Structured Query Language) (sql)

T1 – insertion

Insertion – trigger – store the values in another table (t2)

The production.product\_audits table has all the columns from the production.products table. In addition, it has a few more columns to record the changes e.g., updated\_at, operation, and the change\_id.

2) Creating an after DML trigger

First, to create a new trigger, you specify the name of the trigger and schema to which the trigger belongs in the CREATE TRIGGER clause:

CREATE TRIGGER production.trg\_product\_audit

Code language: SQL (Structured Query Language) (sql)

Next, you specify the name of the table, which the trigger will fire when an event occurs, in the ON clause:

ON production.products

Code language: SQL (Structured Query Language) (sql)

Then, you list the one or more events which will call the trigger in the AFTER clause:

AFTER INSERT, DELETE

Code language: SQL (Structured Query Language) (sql)

The body of the trigger begins with the AS keyword:

AS

BEGIN

Code language: SQL (Structured Query Language) (sql)

After that, inside the body of the trigger, you set the SET NOCOUNT to ON to suppress the number of rows affected messages from being returned whenever the trigger is fired.

SET NOCOUNT ON;

Code language: SQL (Structured Query Language) (sql)

The trigger will [insert a row](https://www.sqlservertutorial.net/sql-server-basics/sql-server-insert/) into the production.product\_audits table whenever a row is inserted into or deleted from the production.products table. The data for insert is fed from the INSERTED and DELETED tables via the [UNION ALL](https://www.sqlservertutorial.net/sql-server-basics/sql-server-union/) operator:

INSERT INTO

production.product\_audits

(

product\_id,

product\_name,

brand\_id,

category\_id,

model\_year,

list\_price,

updated\_at,

operation

)

SELECT

i.product\_id,

product\_name,

brand\_id,

category\_id,

model\_year,

i.list\_price,

GETDATE(),

'INS'

FROM

inserted AS i

UNION ALL

SELECT

d.product\_id,

product\_name,

brand\_id,

category\_id,

model\_year,

d.list\_price,

getdate(),

'DEL'

FROM

deleted AS d;

Code language: SQL (Structured Query Language) (sql)

The following put all parts together:

CREATE TRIGGER production.trg\_product\_audit

ON production.products

AFTER INSERT, DELETE

AS

BEGIN

SET NOCOUNT ON;

INSERT INTO production.product\_audits(

product\_id,

product\_name,

brand\_id,

category\_id,

model\_year,

list\_price,

updated\_at,

operation

)

SELECT

i.product\_id,

product\_name,

brand\_id,

category\_id,

model\_year,

i.list\_price,

GETDATE(),

'INS'

FROM

inserted i

UNION ALL

SELECT

d.product\_id,

product\_name,

brand\_id,

category\_id,

model\_year,

d.list\_price,

GETDATE(),

'DEL'

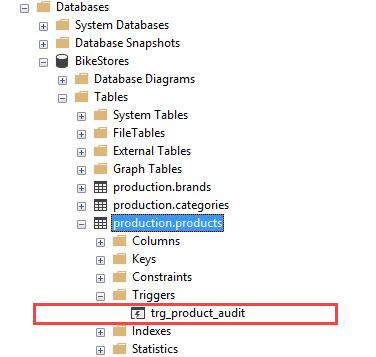
FROM

deleted d;

END

Code language: SQL (Structured Query Language) (sql)

Finally, you execute the whole statement to create the trigger. Once the trigger is created, you can find it under the triggers folder of the table as shown in the following picture:



3) Testing the trigger

The following statement [inserts a new row](https://www.sqlservertutorial.net/sql-server-basics/sql-server-insert/) into the production.products table:

INSERT INTO production.products(

product\_name,

brand\_id,

category\_id,

model\_year,

list\_price

)

VALUES (

'Test product',

1,

1,

2018,

599

);

Code language: SQL (Structured Query Language) (sql)

Because of the INSERT event, the production.trg\_product\_audit trigger of production.products table was fired.

Let’s examine the contents of the production.product\_audits table:

SELECT

\*

FROM

production.product\_audits;

Code language: SQL (Structured Query Language) (sql)

Here is the output:

SQL Server Create Trigger - After Insert Example

The following statement deletes a row from the production.products table:

DELETE FROM

production.products

WHERE

product\_id = 322;

Code language: SQL (Structured Query Language) (sql)

As expected, the trigger was fired and inserted the deleted row into the production.product\_audits table:

SELECT

\*

FROM

production.product\_audits;

Code language: SQL (Structured Query Language) (sql)

The following picture shows the output:

SQL Server Create Trigger - After delete Example

In this tutorial, you have learned how to create a trigger in SQL Server to respond to one or more events such as insert and delete.