



Triggers

<Let's explore base 'triggers' concept>



About me:

- Senior Software Engineer
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What SQL trigger is?

A SQL trigger is a database object that automatically executes when a specified event occurs on a particular table or view.

Trigger key aspects?

Executes automatically based on defined events

Can run before or after the triggering event

Performs actions like validating input data, maintaining audit trails, or enforcing complex business rules

Defined using SQL statements and stored in the database

Can access and modify database data

Trigger BEFORE | AFTER

Simple sample:



ATTENTION!

**INLINE TRIGGER
CREATION DOESN'T
WORK WITH POSTGRES**

**(It works with MySQL,
Oracle, etc...)**

-- Create trigger with inline function definition

```
CREATE TRIGGER log_product_changes
BEFORE | AFTER UPDATE ON products
FOR EACH ROW
EXECUTE PROCEDURE (
  BEGIN
    INSERT INTO product_audit_log(product_id, old_price, new_price)
    VALUES (NEW.id, OLD.price, NEW.price);
    RETURN NULL;
  END;
);
```

Postgres sample:

Firstly, we create a function

Via OLD and NEW we reference to the OLD and NEW row data

New TRIGGER with name

When should be called BEFORE or AFTER

Specifies whether the trigger function should be fired once for every row affected by the trigger event, or just once per SQL statement. If neither is specified, FOR EACH STATEMENT default.

When should be called BEFORE or AFTER (only)

```
CREATE OR REPLACE FUNCTION log_product_price_update()  
  RETURNS TRIGGER AS $$  
BEGIN  
  INSERT INTO product_audit_log(product_id, old_price, new_price)  
  VALUES (NEW.id, OLD.price, NEW.price);  
  RETURN NULL;  
END;  
$$ LANGUAGE plpgsql;
```

```
CREATE OR REPLACE TRIGGER log_product_changes  
  BEFORE|AFTER UPDATE|DELETE|TRUNCATE|INSERT ON products  
  FOR EACH ROW|FOR EACH STATEMENT  
  EXECUTE FUNCTION log_product_price_update();
```

Trigger
INSTEAD OF

INSTEAD OF sample:

Firstly, we need some VIEW

```
CREATE VIEW some_view AS...
```

Then we need a function to trigger

```
CREATE OR REPLACE FUNCTION log_product_price_update()  
  RETURNS TRIGGER AS $$
```

```
BEGIN
```

```
  SOME LOGIC...
```

```
  RETURN NULL;
```

```
END;
```

```
$$ LANGUAGE plpgsql;
```

Then we need to create a TRIGGER

```
CREATE OR REPLACE TRIGGER log_product_changes
```

```
  INSTEAD OF INSERT ON some_view
```

```
  FOR EACH ROW
```

```
  EXECUTE FUNCTION log_product_price_update();
```

Use INSTEAD OF on VIEW.
When we would try to insert into the VIEW, then the trigger will be executed and will insert data into real table (as described in func). Without trigger we would get an error.

INSTEAD OF supports:

Database	Supports <code>INSTEAD OF</code> ?	Applies to Views?	Applies to Tables?
PostgreSQL	✓ Yes	✓ Yes	✗ No
SQL Server	✓ Yes	✓ Yes	✓ Yes (rare)
Oracle	✓ Yes	✓ Yes	✗ No
SQLite	✓ Yes	✓ Yes	✗ No
MySQL	✗ No	✗ No	✗ No
MariaDB	✗ No	✗ No	✗ No

Additional info:

When	Event	Row-level	Statement-level
BEFORE	INSERT/UPDATE/DELETE	Tables and foreign tables	Tables, views, and foreign tables
	TRUNCATE	—	Tables and foreign tables
AFTER	INSERT/UPDATE/DELETE	Tables and foreign tables	Tables, views, and foreign tables
	TRUNCATE	—	Tables and foreign tables
INSTEAD OF	INSERT/UPDATE/DELETE	Views	—
	TRUNCATE	—	—

<https://www.postgresql.org/docs/current/sql-createtrigger.html>

Thank you

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