PostgreSQL Primary Key

Summary: in this tutorial, we will show you what the primary key is and how to manage PostgreSQL primary key constraints through SQL statements.

A primary key is a column or a group of columns used to identify a row uniquely in a table.

You define primary keys through primary key constraints. Technically, a primary key constraint is the combination of a not-null constraint and a UNIQUE constraint.

A table can have one and only one primary key. It is a good practice to add a primary key to every table. When you add a primary key to a table, PostgreSQL creates a unique B-tree index on the column or a group of columns used to define the primary key.

Define primary key when creating the table

Normally, we add the primary key to a table when we define the table's structure using CREATE TABLE statement.

```
CREATE TABLE TABLE ( column_1 data_type PRIMARY KEY, column_2 data_type, … );
```

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

The following statement creates a purchase order (PO) header table with the name `po_headers`.

```
CREATE TABLE po_headers ( po_no INTEGER PRIMARY KEY, vendor_no INTEGER, description TEXT, shipping_address TEXT );
```

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

The `po_no` is the primary key of the `po_headers` table, which uniquely identifies purchase order in the `po_headers` table.

In case the primary key consists of two or more columns, you define the primary key constraint as follows:

```
CREATE TABLE TABLE ( column_1 data_type, column_2 data_type, … PRIMARY KEY (column_1, column_2) );
```

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

For example, the following statement creates the purchase order line items table whose primary key is a combination of purchase order number (`po_no`) and line item number (`item_no`).

```
CREATE TABLE po_items ( po_no INTEGER, item_no INTEGER, product_no INTEGER, qty INTEGER, net_price NUMERIC, PRIMARY KEY (po_no, item_no) );
```

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

If you don't specify explicitly the name for primary key constraint, PostgreSQL will assign a default name to the primary key constraint. By default, PostgreSQL uses `table-name_pkey` as the default name for the primary key constraint. In this example, PostgreSQL creates the primary key constraint with the name `po_items_pkey` for the `po_items` table.

In case you want to specify the name of the primary key constraint, you use `CONSTRAINT` clause as follows:

```
CONSTRAINT constraint_name PRIMARY KEY(column_1, column_2,...);
```

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

Define primary key when changing the existing table structure

It is rare to define a primary key for existing table. In case you have to do it, you can use the ALTER TABLE statement to add a primary key constraint.

```
ALTER TABLE table_name ADD PRIMARY KEY (column_1, column_2);
```

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

The following statement creates a table named `products` without defining any primary key.

```
CREATE TABLE products ( product_no INTEGER, description TEXT, product_cost NUMERIC );
```

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

Suppose you want to add a primary key constraint to the `products` table, you can execute the following statement:

```
ALTER TABLE products ADD PRIMARY KEY (product_no);
```

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

How to add an auto-incremented primary key to an existing table

Suppose, we have a `vendors` table that does not have any primary key.

```
CREATE TABLE vendors (name VARCHAR(255));
```

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

And we add few rows to the `vendors` table using INSERT statement:

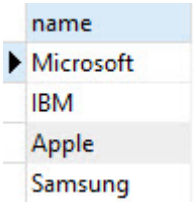
```
INSERT INTO vendors (NAME) VALUES ('Microsoft'), ('IBM'), ('Apple'), ('Samsung');
```

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

To verify the insert operation, we query data from the `vendors` table using the following SELECT statement:

```
SELECT * FROM vendors;
```

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



name
Microsoft
IBM
Apple
Samsung

Now, if we want to add a primary key named `id` into the `vendors` table and the id field is auto-incremented by one, we use the following statement:

```
ALTER TABLE vendors ADD COLUMN ID SERIAL PRIMARY KEY;
```

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

Let's check the `vendors` table again.

```
SELECT id,name FROM vendors;
```

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

id	name
1	Microsoft
2	IBM
3	Apple
4	Samsung

Remove primary key

To remove an existing primary key constraint, you also use the `ALTER TABLE` statement with the following syntax:

```
ALTER TABLE table_name DROP CONSTRAINT primary_key_constraint;
```

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

For example, to remove the primary key constraint of the `products` table, you use the following statement:

```
ALTER TABLE products DROP CONSTRAINT products_pkey;
```

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

In this tutorial, you have learned how to add and remove primary key constraints using `CREATE TABLE` and `ALTER TABLE` statements.