Capgemini

PostgreSQL

Lesson 2: PostgreSQL – Managing Tables

Lesson Objectives

In this lesson, you will learn about:

- ALTER Table
- TRUNCATE Table
- Constraints on table columns
  - Primary Key
  - Foreign Key
  - Check Constraint
  - Unique Constraint
  - NOT NULL constraint

ALTER Table

- To change existing table structure we have to use ALTER TABLE command
- We can perform following actions using ALTER Table command:
  - Add, remove or rename column
  - Set default value for the column
  - Rename table

```
ALTER TABLE employee ADD COLUMN job varchar(15);
```

- Add new column job to employee table:

```
ALTER TABLE table_name ADD COLUMN column_name;
```

- To drop column:

```
ALTER TABLE table_name DROP COLUMN column_name;
```

ALTER Table

- To rename existing column:

```
ALTER TABLE employee RENAME COLUMN job TO designation;
```

- To set default value to a column:

```
ALTER TABLE employee ALTER COLUMN designation set DEFAULT ‘SE’;
```

Truncate Table

- To remove data from table we use DELETE command
- But, for larger tables it is more efficient to use TRUNCATE
- TRUNCATE TABLE removes all rows from a table without scanning the table
- So it is faster than DELETE statement
- Also, it reclaims the storage space

```
TRUNCATE TABLE dummy_table;
```

- We can also truncate multiple tables at a time

```
TRUNCATE TABLE table1, table2;
```

Table Constraints

- Constraints on Table:
  - Primary Key
  - Foreign Key
  - Check Constraint
  - Unique Constraint
  - NOT NULL constraint

Primary Key Constraint

- Primary Key is a column or multiple columns used to identify a row uniquely in a table
- Primary key is a combination of NOT NULL and Unique constraints
- A table can have one and only one primary key
- It is good to have a primary key for each table
- Primary key column while creating a table:

```
CREATE TABLE product(
        product_id int PRIMARY KEY,
        pname varchar(10),
        price int
);
```

Primary Key Constraint

- Creating primary key for a combination of columns:

```
CREATE TABLE Order(
    order_id int,
    product_id int,
    qty int,
    price int,
    PRIMARY KEY (order_id, product_id)
);
```

- Define primary key for existing table:

```
ALTER TABLE product
ADD PRIMARY KEY (product_id);
```

Primary Key - serial

- Creating primary key on a table to generate sequential numbers for a column:

```
CREATE TABLE Vendor(
        vname varchar(20)
);
insert into Vendor values ('Microsoft'),('IBM'), ('Google'), ('Micromax'),('Samsung');
```

- Define serial primary key for existing table:

```
ALTER TABLE vendor ADD column ID Serial PRIMARY KEY;
```

```
testdb=# select * from vendor;
   vname   | id
-----------+----
 Microsoft |  1
 Apple     |  2
 IBM       |  3
 Samsung   |  4
 Google    |  5
(5 rows)
```

Foreign Key Constraint

- Foreign Key indicates that values in a column or group of columns in a child table match with the values in a column or group of columns of the parent table
- Foreign key constraint maintains referential integrity between child and parent tables
- Foreign key column while creating a table:

```
CREATE TABLE department(
        deptno int,
        dname varchar(20)
);
CREATE TABLE employee(
        empid int PRIMARY KEY,
        name varchar(10),
        deptno int,
        FOREIGN KEY (deptno) REFERENCES department(deptno)
);
```

Foreign Key Constraint

- Add foreign key constraint on existing table:

```
ALTER TABLE child_table
ADD CONSTRAINT constraint_name FOREIGN KEY (c1) REFERENCES parent_table(p1);
```

CHECK Constraint

- CHECK constraint allows you to specify if a value in a column must meet a specific requirement.
- CHECK constraint uses a Boolean expression to evaluate the value of a column
- If the values of the column pass the check, PostgreSQL will insert or update those values
- Example for CHECK constraint:

```
CREATE TABLE employee(
        empid int PRIMARY KEY,
        name varchar(10),
        deptno int,
        birth_date date CHECK (birth_date > '1900-01-01'),
        salary numeric CHECK (salary >0)
);
```

CHECK Constraint

- Add CHECK constraint on existing table:

```
ALTER TABLE price_list
ADD CONSTRAINT price_discount_chk CHECK(
        price > 0
        AND discount >= 0
        AND price > discount
);
```

Unique Constraint

- Sometimes we need values in a column to be unique across the table
- Unique constraint ensures uniqueness of data
- Every time you insert a new row, PostgreSQL checks if the value is already in the table
- Unique key allows null values
- You can have more than one column with Unique key constraint
- Foreign key column while creating a table:

```
CREATE TABLE employee(
        empid int PRIMARY KEY,
        name varchar(10),
        deptno int,
        email varchar(50) UNIQUE
);
```

NOT NULL Constraint

- NULL is a missing or unknown information
- NULL value is not zero or empty string
- NULL cannot be equated to anything, not even NULL
- To check if a value is NULL use IS NULL or IS NOT NULL

```
CREATE TABLE employee(
        empid int PRIMARY KEY,
        name varchar(10) NOT NULL,
        deptno int NOT NULL,
        email varchar(50) UNIQUE
);
```

Demo

- ALTER Table
- Truncate Table
- Adding Constraints

Lab

Lab 3

Summary

In this lesson, you have learn about:

- Use ALTER Table command to add, remove and rename a column in a table
- You can add new constraints to the column using Alter table command
- Truncate table command will remove all rows from the table but will keep the table structure
- Constraints:
  - Primary Key – ensures unique and not null value
  - Foreign Key – relates columns from two tables
  - Check constraint – restricts data according to condition provided
  - Unique constraint – ensures unique values including one null value
  - NOT NULL constraint – will not allow null value

Review Question

Question 1: What is the difference between truncate command and delete command?

Question 2: Which of the following constraint can be used to ensure that a numeric column does not take negative values?

- Primary key
- Unique
- Not null
- Check
- Foreign key

People matter, results count.

About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 200,000 team members in over 40 countries. The Group reported 2016 global revenues of EUR 12.5 billion.

Visit us at

www.capgemini.com