# Research and Details on MySQL Procedure Privileges

This document provides an in-depth analysis of MySQL's privileges related to stored procedures, including their creation, execution, modification, and the associated security implications.

## 1. MySQL Stored Procedures and Privileges

MySQL stored procedures are database routines that allow for encapsulated logic. To manage these procedures effectively, MySQL uses a privilege-based access control system. Key privileges include ALTER ROUTINE and EXECUTE, which are discussed below.

## 2. Key Privileges for Stored Procedures

The two primary privileges related to stored procedures are:

1. ALTER ROUTINE: Allows a user to modify or drop a stored procedure.  
2. EXECUTE: Allows a user to execute (invoke) the stored procedure.

## 3. Granting Privileges

To provide access to a stored procedure, specific privileges must be granted. The ALTER ROUTINE privilege does not automatically include the EXECUTE privilege, and vice versa.

### 3.1 Granting ALTER ROUTINE Privilege

To allow a user to modify or drop a procedure, use the following SQL command:

GRANT ALTER ROUTINE ON PROCEDURE schema\_name.procedure\_name TO 'user'@'host';

### 3.2 Granting EXECUTE Privilege

To allow a user to execute a procedure, use the following SQL command:

GRANT EXECUTE ON PROCEDURE schema\_name.procedure\_name TO 'user'@'host';

### 3.3 Granting Both Privileges

If a user needs both privileges, grant them together using:

GRANT ALTER ROUTINE, EXECUTE ON PROCEDURE schema\_name.procedure\_name TO 'user'@'host';

## 4. SQL SECURITY: DEFINER vs INVOKER

MySQL stored procedures can run with the privileges of the user who defined them (DEFINER) or the user who invokes them (INVOKER). Use the SQL SECURITY clause to specify this.

## 5. Errors and Troubleshooting

Common errors related to privileges include:

- ERROR 1370 (42000): ALTER ROUTINE command denied to user.  
- ERROR 1370 (42000): Execute command denied to user.

These errors indicate insufficient privileges. Ensure the user has the necessary ALTER ROUTINE and/or EXECUTE privileges.