



Enterprise Software Specialists

# Examples:

**groovy-liquibase**

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## **Groovy Migrations**

This document contains all liquibase changes translated to groovy

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# Liquibase database changes

This document contains all changes from Liquibase that can be executed with the grails-plugin database-migration. These are the examples from [liquibase.org/manual](http://liquibase.org/manual). I have converted them to groovy changes. After that I tested them on PostgreSQL and some on MySQL.

## Example: changelogFile

```
databaseChangeLog() {  
    // changeSets  
}
```

If quotes are empty, you do not have to use that parameter. See example with addColumn - schemaName.

## Example: Add Column

```
changeSet(author: "erwin", id: "1") {  
    comment("rollback = yes")  
  
    addColumn(tableName: "books", schemaName: "") {  
        column(name: "firstname", type: "varchar(255)")  
    }  
}
```

Could be ...

```
changeSet(author: "erwin", id: "1") {  
    comment("rollback = yes")  
  
    addColumn(tableName: "person") {  
        column(name: "firstname", type: "varchar(255)")  
    }  
}
```

If the comment tag contains rollback = no, you will have to create your own rollback. You have got two possibilities. See next example....

## Example: Drop Column with own rollback

```
changeSet(author: "erwin", id: "4") {  
    comment("rollback = no")  
  
    dropColumn(tableName: "Person", columnName: "test")  
  
    rollback{  
        addColumn(tableName: "Person") {  
            column(name: "test", type: "varchar(255)")  
        }  
        //of SQL in rollback  
        rollback("""  
                //SQL QUERY;  
                """)  
    }  
}
```

On the last page is an example of an grails change. You can use groovy in this change.  
Do Not use groovy outside a grails change, this will always be executed!! Unless you want that.

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## Structural Refactorings

<http://www.liquibase.org/manual/home>

### Add column

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    addColumn(tableName: "persons", schemaName: "") {
        column(name: "boss", type: "int") {
            constraints(nullable: "false", foreignKeyName:
                "FK_persons_boss_persons_id", references: "persons(id)")
        }
    }
    // possible parameters → Column
    // String name, String type, String value, Number valueNumeric, Date valueDate,
    // Boolean valueBoolean, String defaultValue, Number defaultValueNumeric,
    // Date defaultValueDate, Boolean defaultValueBoolean,
    // DatabaseFunction defaultValueComputed, Boolean autoIncrement, String remarks

    // possible parameters → Constraints
    // Boolean nullable, Boolean primaryKey, String primaryKeyname,
    // String primaryKeyTablespace, String references, Boolean unique,
    // String uniqueConstraintName, String check, Boolean deleteCascade,
    // String foreignKeyName, Boolean initiallyDeferred, Boolean deferrable
}
```

### Rename column

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    renameColumn(tableName: "test", oldColumnName: "testcolumn", schemaName: ""
        newColumnName: "testrenamekolom", columnDataType: "int")
}
```

### Drop column

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropColumn(tableName: "person", schemaName: "", columnName: "testcolumn")
}
```

### Alter sequence

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    alterSequence(sequenceName: "seq_employee_id", incrementBy: "10")
}
```

## Create Table

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    createTable(tableName: "person", schemaName: "", tablespace: "", remarks: "") {
        column(name: "id", type: "int") {
            constraints(primaryKey: "true", nullable: "false")
        }
        column(name: "firstname", type: "varchar(255)")
        column(name: "lastname", type: "varchar(255)")
        column(name: "username", type: "varchar(255)") {
            constraints(unique: "true", nullable: "false")
        }
        column(name: "testid", type: "int")
    }
}
```

## Rename table

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    renameTable(oldTableName: "employee", schemaName: "", newTableName: "person")
}
```

## Drop table

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropTable(tableName: "person", schemaName: "mySchema", cascadeConstraints: "true")
    // @ cascadeConstraints
    // Mysql won't work, before      -> sql("SET foreign_key_checks = 0;")
    // After dropTable              -> sql("SET foreign_key_checks = 1;")
}
```

## Create view

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    createView("select id, firstname from person", viewName: "personView",
        schemaName: "", replaceIfExists: "true")
}
```

## Rename view

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    renameView(schemaName: "", oldViewName: "personView", newViewName: "people")
}
```

## Drop view

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropView(schemaName: "", viewName: "personView")
}
```

## Merge columns

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    mergeColumns(tableName: "person", schemaName: "", column1Name: "phoneAreaCode",
        joinString: "-", column2Name: "phoneSuffix", finalColumnName: "phone",
        finalColumnType: "varchar(50)")
}
```

## Create stored procedure

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    createProcedure("""
        CREATE OR REPLACE PROCEDURE testHello
        IS
        BEGIN
            DBMS_OUTPUT.PUT_LINE('Hello From The Database!');
        END;""")
}
```

## Data quality refactorings

### Add lookup table

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    addLookupTable(existingTableName: "address",
        existingColumnName: "state",
        existingTableSchemaName: "",
        newTableSchemaName: "",
        newTableName: "state",
        newColumnName: "abbreviation",
        constraintName: "fk_address_state",
        newColumnDataType: "Required for mysql")
}
```

### Add not-null constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    addNotNullConstraint(tableName: "employee", schemaName: "",
        columnName: "employer_id", defaultNullValue: "1",
        columnDataType: "required for mysql and ms-sql only")
}
```

### Drop not-null constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    dropNotNullConstraint(tableName: "employee", schemaName: "", columnName: "id",
        columnDataType: "Required mysql, ms-sql and postgresSQL")
}
```

### Add unique constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    addUniqueConstraint(tableName: "person", schemaName: "",
        tablespace: "", columnNames: "id", constraintName: "pk_person",
        deferrable: "", initiallyDeferred: "", disabled: "")
}
```

### Drop unique constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropUniqueConstraint(tableName: "person",
        schemaname: "", constraintName: "pk_person")
}
```

### Create sequence

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    createSequence(sequenceName: "seq_employee_id", schemaName: "",
        incrementBy: "", minValue: "", maxValue: "", startValue: "",
        ordered: "", cycle: "")
}
```

### Drop sequence

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropSequence(sequenceName: "seq_employee_id", schemaName: "")
}
```

### Add auto-increment

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    addAutoIncrement(tableName: "person", schemaName: "",
        columnName: "id", columnDataType: "int")
}
```

### Add default value

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes, one of defaultValue* required")

    addDefaultValue(tableName: "file", schemaName: "", columnName: "fileName",
        columnDataType: "", defaultValue: "New File", defaultValueNumeric: "1",
        defaultValueBoolean: "true", defaultValueDate: "")
}
```

### Drop default value

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropDefaultValue(tableName: "file", schemaName: "",
        columnName: "fileName", dataColumnType: "")
}
```

## Referential integrity refactorings

### Add foreign key constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    addForeignKeyConstraint(constraintName: "fk_address_person",
        baseTableName: "address", referencedTableName: "person",
        baseTableSchemaName: "", referencedTableSchemaName: "",
        baseColumnNames: "person_id", referencedColumnNames: "id",
        deferrable: "", initiallyDeferred: "", onDelete: "", onUpdate: "")
}
```

### Drop foreign key constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropForeignKeyConstraint(constraintName: "fk_address_person",
        baseTableName: "address", baseTableSchemaName: "")
}
```

### Drop all foreign key constraints

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropAllForeignKeyConstraints(baseTableName: "address", baseTableSchemaName: "")
}
```

### Add primary key constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    addPrimaryKey(tableName: "person", schemaName: "", tablespace: "",
        columnNames: "id", constraintName: "pk_person")
}
```

### Drop primary key constraint

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropPrimaryKey(tableName: "person", schemaName: "", constraintName: "pk_person")
}
```

## Non-Refactoring transformations

### Insert data

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    insert(tableName: "People", schemaName: "") {
        column(name: "id", valueNumeric: "2")
        column(name: "firstname", value: "Fred")
        column(name: "testid", valueNumeric: "2")
    }
}
```



## Load data

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    loadData(tableName: "users", schemaName: "", file: "com/sample/users.csv",
        encoding: "") {
        column(name: "id", type: "NUMERIC")
        column(name: "firstname", type: "STRING")
    }
}
```

## Load update data

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no, only Oracle")

    loadUpdateData(tableName: "users", schemaName: "", file: "com/sample/users.csv",
        encoding: "", primaryKey: "id") {
        column(name: "id", type: "NUMERIC")
        column(name: "firstname", type: "STRING")
    }
}
```

## Update data

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    update(tableName: "ProductSettings", schemaName: "") {
        column(name: "property", value: "vatCategory")
        where("property='vat'")
    }
}
```

## Delete data

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    delete(tableName: "People", schemaName: "") {
        where("id=2")
    }
}
```

## Tag database

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    tagDatabase(tag: "version_1.3")
}
```

## Stop

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    stop("Halted LiquiBase for debugging")
}
```

## Architectural refactorings

### Create index

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes")

    createIndex(tableName: "user", schemaName: "", indexName: "idx_person_name",
        tablespace: "", unique: "") {
        column(name: "firstname")
        column(name: "lastname")
    }
}
```

### Drop index

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    dropIndex(indexName: "idx_user_username", tableName: "table_name", schemaName: "")
}
```

## Custom refactorings

### Modifying generated SQL

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no, more info on liquibase.org")

    createTable(tableName: "person") {
        column(name: "id", type: "bigint")
        column(name: "firstname", type: "varchar(255)")
        column(name: "lastname", type: "varchar(255)")
    }
    modifySql {
        replace(replace: "bigint", with: "long")
        // prepend(value: "sql")  add SQL before
        // append(value: "sql")   add SQL after
    }
    modifySql(dbms: "mysql") {
        append(value: " engine innodb")
    }
}
```

### Custom SQL

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    sql("insert into person (id, name) values (1, 'Bob')")
}
```

### Custom SQL file

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    sqlFile(path: "sample.sql", stripComments: "true or false",
        splitStatements: "true or false", encoding: "",
        endDelimiter: "; or / or something else",
        relativeToChangelogFile: "true or false")
}
```

## Custom refactoring class

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = yes if made, more info on liquibase.org")

    customChange(class: "com.example.ExampleCustomChange") {
        param(name: "tableName", value: "person")
        param(name: "columnName", value: "employee_id")
    }
}
```

## Execute shell command

```
changeSet(author: "erwin", id: "1") {
    comment("rollback = no")

    executeCommand(executable: "mysqldump", os: "Windows XP") {
        arg(value: "--add-drop-database")
        arg(value: "--compress")
        arg(value: "dbName")
    }
}
```

## Other

### Preconditions

```
// preconditions before comment!

changeSet(author: "erwin", id: "1") {
    preConditions(onFail: "HALT") {
        sqlCheck("select count(*) from persoon", expectedResult: "1")
    }
    comment("If precondition fails, stop")
}

// possible parameters → preconditions
// onError: "HALT/WARN/MARK_RAN/CONTINUE"
// onUpdateSql: "RUN/FAIL/IGNORE"
// onFailMessage:, onErrorMessage: "message string"

// It is also possible to use "and" and "or"

changeSet(author: "erwin", id: "1") {
    preConditions (onFail: "WARN", onFailMessage: "changeset 1 failed") {
        or {
            and {
                dbms(type: "oracle")
                runningAs(username: "SYSTEM")
            }
            and {
                dbms(type: "mysql")
                runningAs(username: "as")
            }
        }
    }
    comment("If precondition fails, warning")
}
```

## Contexts

```
// You can use context to specify which changeSets to be run.  
// grails dbm-update --contexts=test  
// Only changeSets with context: "test" or 'no context set' will run.  
// Multiple contexts possible. See example  
  
changeSet(author: "erwin", id: "1", context: "test","production")  
    comment("comments")  
}
```

## Include

```
// If you want to include other changelog(s).groovy for better structure use include  
// Include is outside a changeSet. Use file:  
  
databaseChangeLog() {  
    include(file: "file.groovy")  
}  
  
// If you want to include all changelogs from a path. Use path:  
  
databaseChangeLog() {  
    include(path: "path/")  
}
```