

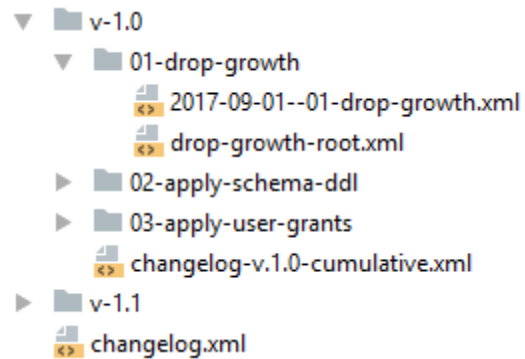
Introduce Liquibase Guide

1. Migrate container with control data not dependent on control data of another container
2. Migrate container with control data dependent on control data of another container
3. Add new changeset to container which is already migrated to Liquibase
4. Resolve lock/build fail issues

Migrate container with control data not dependent on control data of another container

1. Create changesets and changelogs for applying existing SQL-scripts to database
 - The database changelog file is where all database changes are listed.

- Create the following hierarchy



- Root changelog.xml file should contain references to its child-changelogs,

changelog.xml

```
<?xml version="1.0" encoding="UTF-8"?>

<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"

  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
```

```
http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

    <include file="v-1.0/changelog-v.1.0-cumulative.xml" relativeToChangelogFile="true"/>

</databaseChangeLog>
```

- Child-changelogs for each version provide paths to changelogs for each change,

changelog-v.1.0-cumulative.xml

```
<?xml version="1.0" encoding="UTF-8"?>

<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"

    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

    xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog

        http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

    <include file="01-drop-growth/drop-growth-root.xml" relativeToChangelogFile="true"/>

    <include file="02-apply-schema-ddl/apply-schema-ddl-root.xml" relativeToChangelogFile="true"/>

    <include file="03-apply-user-grants/apply-user-grants-root.xml" relativeToChangelogFile="true"/>

</databaseChangeLog>
```

- Last changelogs provides changesets (or paths to them),

drop-growth-root.xml

```
<?xml version="1.0" encoding="UTF-8"?>

<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"

    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

```

xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

    <include file="2017-09-01--01-drop-growth.xml" relativeToChangelogFile="true"/>

</databaseChangeLog>

```

- Changeset is an atomic change that you want to apply to your database.

2017-09-01--01-drop-growth.xml

```

<?xml version="1.0" encoding="UTF-8"?>

<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

    <changeSet id="drop-growth" author="DBA" runAlways="true">

        <sqlFile path="src/main/sql/drop-growth.sql" endDelimiter="\n\s*\n|\n\s*$" splitStatements="true" />

    </changeSet>

</databaseChangeLog>

```

2. Adapt SQL-scripts to Liquibase (liquibase-maven-plugin)
 - Ensure you've correctly provided paths to your XML/SQL files
3. Replace exec-maven-plugin (was used to apply scripts earlier) with liquibase-maven-plugin
 - Add liquibase-maven-plugin to container's pom and provide the path and database properties

replace exec-maven-plugin with liquibase

```
<plugin>

  <groupId>org.liquibase</groupId>

  <artifactId>liquibase-maven-plugin</artifactId>

  <version>${liquibase.version}</version>

  <configuration>

    <changeLogFile>src/main/db-migration/changelog.xml</changeLogFile>

    <driver>${jdbc.driverClassName}</driver>

    <url>${jdbc.url}</url>

    <username>${jdbc.admin.username}</username>

    <password>${jdbc.admin.password}</password>

    <outputFileEncoding>UTF-8</outputFileEncoding>

    <verbose>true</verbose>

  </configuration>

  <executions>

    <execution>

      <phase>process-test-resources</phase>

      <goals>

        <goal>update</goal>

      </goals>

    </execution>

  </executions>

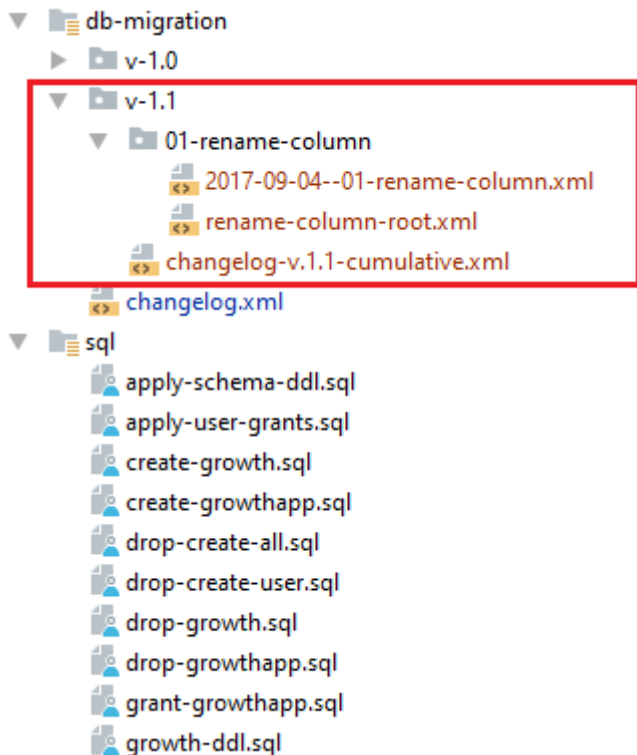
</plugin>
```

Migrate container with control data dependent on control data of another container

1. Firstly - migrate to Liquibase all containers from which target container depends on
 2. Use instructions from the previous point to control data that belongs to target container
 3. Add appropriate changesets for steps which require applying scripts from other containers. Avoid using **target** build folder in paths
-

Add new changeset to container which is already migrated to Liquibase

1. Create folder with updated naming for introducing SQL updates in path relative to existing version
2. Create all the necessary files for applying SQL-scripts, such as:
 - Changeset which would apply SQL
 - Changelog for the current changeset file



changelog-v.1.1-cumulative.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
    http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

  <include file="01-rename-column/rename-column-root.xml" relativeToChangelogFile="true"/>
</databaseChangeLog>
```

rename-column-root.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
    http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

  <include file="2017-09-04--01-rename-column.xml" relativeToChangelogFile="true"/>
</databaseChangeLog>
```

You could apply changes using SQL commands in the changeset:

2017-09-04--01-rename-column.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
    http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

  <changeSet id="drop-growth" author="DBA" runAlways="true">
    <sql>
      ALTER TABLE GROWTH.BRAND RENAME COLUMN LOGO_FILE_NM TO ANOTHER_LOGO_FILE_NM
    </sql>
  </changeSet>
</databaseChangeLog>
```

Or you could apply changes via SQL files:

2017-09-04--01-rename-column.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
    http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

  <changeSet id="rename-column-growth" author="DBA" runAlways="true">
    <sqlFile path="src/main/sql/rename-column-growth.sql" endDelimiter="\n\s*\n|\n\s*$" splitStatements="true" />
  </changeSet>
</databaseChangeLog>
```

Or you could apply changes using Liquibase DSL:

2017-09-04--01-rename-column.xml

```
<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
    http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

  <changeSet id="rename-column" author="DBA" runAlways="true">
    <renameColumn catalogName="GROWTH"
      tableName="BRAND"
      oldColumnName="LOGO_FILE_NM"
      newColumnName="ANOTHER_LOGO_FILE_NM" />
  </changeSet>
</databaseChangeLog>
```

3. Add path to created changelog in the root changelog file

```

<?xml version="1.0" encoding="UTF-8"?>
<databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
    http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

  <include file="v-1.0/changelog-v.1.0-cumulative.xml" relativeToChangelogFile="true"/>

  <include file="v-1.1/changelog-v.1.1-cumulative.xml" relativeToChangelogFile="true"/>

</databaseChangeLog>

```

Don't forget to **change current version of DDL** in the specific table **VER_NBR** by separate file as a part of your changeset:

```

<?xml version="1.0" encoding="UTF-8"?>

<databaseChangeLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
  xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
    http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.5.xsd">

  <changeSet id="update-version" author="DBA">

    <sql>

      COMMENT ON COLUMN PARTNER.VER_NBR.VER_NBR IS 'Version X.Y.N+1';

    </sql>

  </changeSet>

</databaseChangeLog>

```

Resolve lock/build fail issues

1. Check sum errors, such as

Error:

Check sum error

**[ERROR] Failed to execute goal org.liquibase:liquibase-maven-plugin:3.5.3:update (default) on project growth-db: Error setting up or running Liquibase: Validation Failed:
[ERROR] 1 change sets check sum
[ERROR] src/main/db-migration/v-1.0/03-apply-user-grants/2017-09-01--03-grant-growthapp.xml::grant-growthapp::DBA was: 7:6891dbf5e192de4c53310dd059557b4e but is now: 7:e96a0b28d3d0b0ede19eb0c4a25985b9**

Reason:

The way of applying SQL updates is not correct. Checksum validation errors are thrown by liquibase to indicate that the changes applied to the database no longer match the same content specified within the liquibase changeset files.

Solution:

You should apply changes not directly in SQL-scripts, but inside changesets. Look through [Add new changeset to container which is already migrated to Liquibase](#)

2. Lock errors, such as

Error:

Locks

INFO 9/19/17 2:24 PM: liquibase: Waiting for changelog lock....

Or,

Caused by: liquibase.exception.LockException: Could not acquire change log lock.

Reason:

Occurs when liquibase update process not properly finished (executing errors, emergency stop of running, etc.) or when another liquibase process is running and it waits for ending.

Solution:

Remove lock form **DATABASECHANGELOGLOCK** table by running this against database,

```
UPDATE DATABASECHANGELOGLOCK SET LOCKED=0, LOCKGRANTED=null, LOCKEDBY=null where ID=1;
```