

# Database versioning with FlywayDB

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# Why DB migration tools?

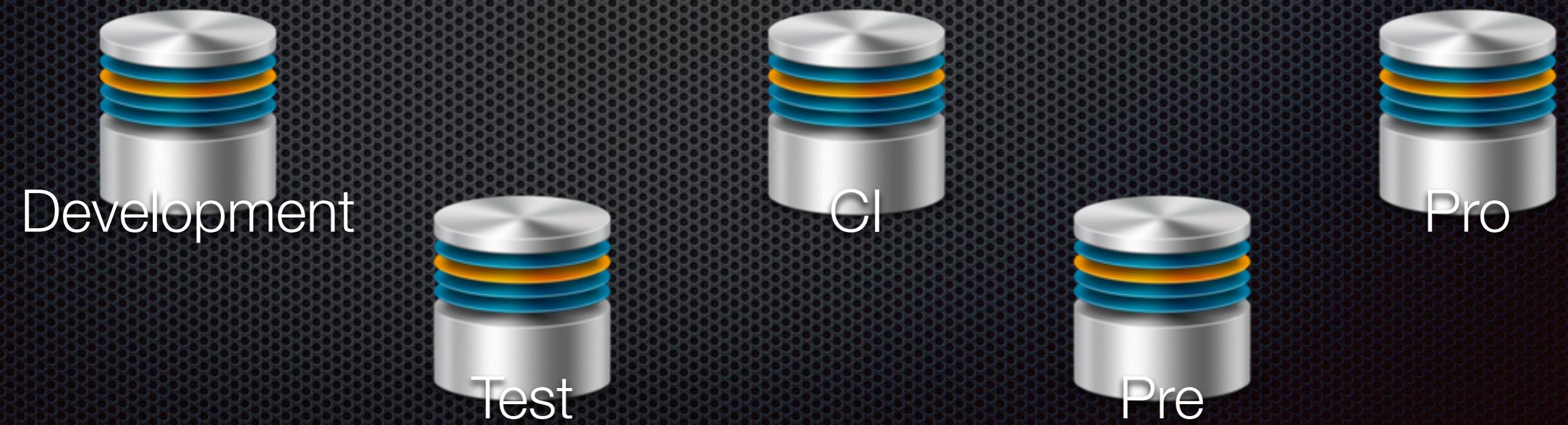
# Why DB migration tools?

Lots of developers!!!



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....in the code side....

Version Control

Release tool/plugins on CI

...but in the Database...

# I WONDER



## HOW TO SET UP A NEW DB?

**DEPLOY TO PRODUCTION?**

**DID YOU APPLY THIS SCRIPT  
TO DB?**

**SO THE SCRIPT WAS  
APPLIED**

**ARE YOU SURE?**

[memegenerator.net](http://memegenerator.net)



Which version is your DB?

**YOU KNOW NOTHING**



**JON SNOW**

What we'd love is...

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Recreate DB from scratch

Make it clear the state of the DB

Migrate in a deterministic way!!



*Flyway*

Database migrations

Made easy

# How FlywayDB works

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Metadata table (SCHEMA\_VERSION)

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Classpath search for migrations

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Classpath search for migrations

SQL or Java

Sorted by version, and applied in order

Compared against current version

Checksum change-detection validation

# Supported DB's

Oracle

HSQL

PostgreSQL

SQL Azure

SQL Server

Derby

Android SQLite

MariaDB

MySQL

DB2

H2

Google Cloud SQL

# Executing FlywayDB

Command Line

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flyway.properties

jars dir

migrations dir

flyway migrate

# Executing FlywayDB

Command Line

Maven Plugin

# Executing FlywayDB

Command Line

Maven Plugin

Ant

# Executing FlywayDB

Command Line

Maven Plugin

Ant

Gradle

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SBT (Scala Build Tool)

# Executing FlywayDB

Command Line

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API

Java classes  
Spring configuration

# Migrations

# Versions

One or more numeric parts

Separated by a dots or an underscore

Underscores are replaced by dots at runtime

Leading zeros are ignored on each part

# Version examples

1	205.68
001	20130115113556
5.2	2013.1.15.11.35.56
5_2 (5.2 at runtime)	2013.01.15.11.35.56
	1.2.3.4.5.6.7.8.9

# SQL Migrations

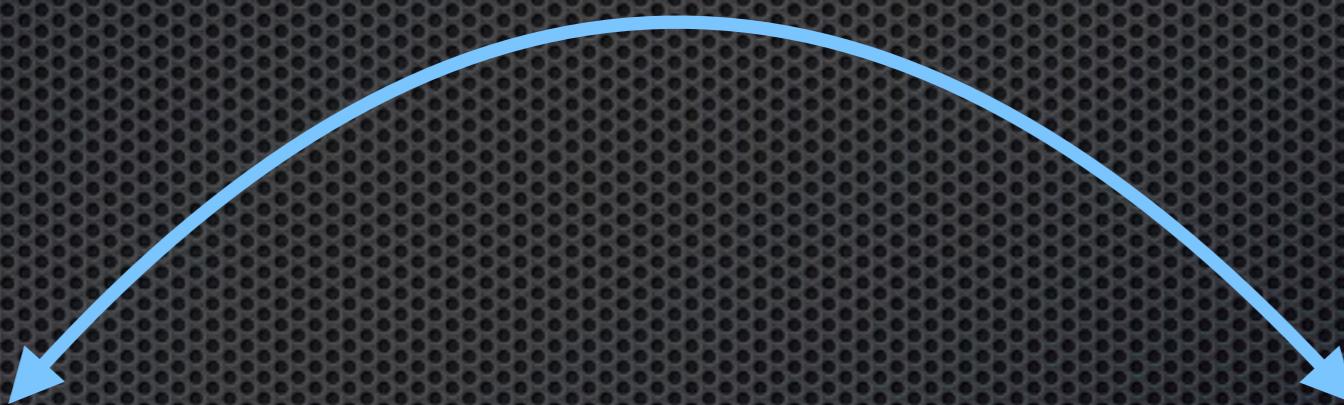
# Discovery

# Discovery

Automatically at runtime

Classpath location

Filesystem location



# Naming

prefix: Configurable, default: V

version: Dots or underscores separate the parts,  
as many parts as you like

separator: Configurable, default: \_\_ (2 underscores)

description: Underscores or spaces to separate  
the words

suffix: Configurable, default: .sql

# Sample SQL versions

V\_1\_\_Add\_phone\_number\_to\_user.sql

V\_2\_\_Remove\_picture\_to\_user.sql

V\_3\_\_Add\_folders\_to\_article.sql

# Syntax

# Syntax

Single/multiline statements

Single/multiline comments

Placeholder replacements

DB specific extensions

# Java Migrations

# ¿Java migrations?

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Advanced Bulk data operations

C/LOB changes

# Discovery

flyway.setLocations(...)

# Naming

prefix: Always V

version: Underscores separate the parts, as many parts as you like

separator: \_\_ (2 underscores)

description: Underscores to separate the words

# Sample Java versions

V\_1\_\_Add\_phone\_number\_to\_user.java

V\_2\_\_Remove\_picture\_to\_user.java

V\_3\_\_Add\_folders\_to\_article.java

# Usage

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Implements JdbcMigration

Extracts the version from class name

Wraps the migration in a transaction

# Advanced usage

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MigrationProviderInfo:

redefine prefix, version, separator...

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MigrationChecksumProvider:  
getChecksum()

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Spring support:

implements SpringJdbcMigration  
(JdbcTemplate)

# Migrating existing databases

# Steps

1. Take a DDL from production
2. Add inserts for all reference data you need
3. Give relevant version number  
(V1\_\_Base-.version.sql)
4. Clean all databases
5. Remove their contents with flyway:clean
6. Align databases with production
7. Exactly the same DDL
8. The objects they migrate must be identical to what is present in production.
9. Give databases initial version

More advanced usage

# Advanced usage

OSGi support

Cluster migrations in parallel

Multiple schema support

Placeholder replacements \${placeholder}

Before-Hibernate-Export integration

# Drawbacks

# Drawbacks

Rollback migrations with destructive changes

Initial schema not retrieved from existing database

DB-specific code must be separated by locations



Flyway

FlywayDB

Demo

Thank you!

Questions?

