Citrus DB

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citrus-db

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Chapter 1. Introduction

This project provides a simple way to simulate relational database servers such as Oracle DB, MySQL, Postgres, MSSQL, DB2 and so on. All applications using JDBC technology in order to access a relational database are able to use this simulated persistence server in testing scenarios.

The Citrus DB project provides a special JDBC driver implementation that connects to the simulated database server. The server accepts any kind of SQL operation like open/close connection, create statement, execute query (SELECT) and execute update (UPDATE, INSERT, DELETE). The server will simulate result sets according to a data set which is defined as Json, YAML or XML data.

The library is based on the test framework Citrus and integrates best in acceptance and integration test scenarios.

Why and when should someone use this database simulation?

1.1. Motivation and Scope

Most of the software components we write require persistent data to be stored in some kind of database. In Java persistence is using Java database connectivity (JDBC) technology for accessing a database. When we test our software in integration tests the persistence infrastructure is always a painful challenge.

This is mainly because:

- Database instances are heavy to setup locally or in a test environment.
- Database licensing may prohibit local installation or multi installation usage in test environments.
- In memory databases are not fully compliant with different SQL dialects and database specific features (e.g. different syntax, column types and stored procedure handling)
- All tables, constraints, views, store procedures and relations (foreign keys) need to exist in test database instance before test
- Setting up proper test data in prior to each test case is very difficult because
  - each test needs a fresh data set
  - test data has to be unique per test in order to get repeatable tests (dynamic test data and automatic cleanup)
- Parallel testing breaks data integrity

1.2. Project status

NOTE: *This project is considered stable but still under construction!*

The Citrus db server application is stable not yet finished. Some features are still under construction. Some aspects are simply not covered yet. Please see the following experimental features.

Experimental features

Proxy mode (record-replay)

First record SQL operations and their outcome then replay captured data

JDBC driver agent

JVM agent using aspect oriented mechanism to inspect foreign driver implementations

Feedback and contributions are highly appreciated!

Chapter 2. Installation

The Citrus DB server is a web application that provides a RESTful API for clients. The server is able to run as Java application on your local machine or as container/pod in Docker, Kubernetes or Openshift.

2.1. JDBC driver usage

That’s it you are ready to use the Citrus db server.

Chapter 3. Concepts

3.1. JDBC driver

3.2. JDBC server

Chapter 4. User interface

The db server application provides a web user interface at `http://localhost:8080` once the server is started on your local machine. You will see the default welcome page.

[default ui]

The default ui is straight forward and limited to viewing Json response data returned by the db server REST API.

Open your browser pointing to the db server UI at `http://localhost:8080`. You will see the extended web application user interface that gives you information about the db server.

4.1. Dashboard

The db server dashboard gives you a quick overview of the numbers and facts such as active connections latest SQL commands and their data set returned.

[dashboard]

Chapter 5. Samples

Documentation can only provide theoretical insights of what the application is capable to do or not to do. Good sample projects help both beginners and experts to reach complete understanding of how the db server works in different environments.

Following from that we try to provide sample project that demonstrate the database server usage in real world examples. Please see the following sample projects with complete code available on github.

5.1. Json dataset sample

Sample repositories

Json dataset

https://github.com/christophd/citrus-db/tree/master/samples/sample-json

Auto generated from swagger

https://github.com/christophd/citrus-db/tree/master/samples/sample-swagger

Chapter 6. Links & Further reading

Reading material

Citrus manual

gives you a detailed description of all Citrus features

Sample projects

demonstrate typical db scenarios with persistence storage

ChangeLog

shows the release history

Contributing

explains how you can contribute to this project