

# Guide to 4.1 Features

Version 4.1 (4.1.RC2)

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This guide highlights the new features and changes introduced in Apache Cayenne 4.1. For a full list of changes consult RELEASE-NOTES.txt included in Cayenne download. For release-specific upgrade instructions check UPGRADE.txt.

# Chapter 1. Java Version

Minimum required JDK version is 1.8 or newer. Cayenne 4.1 is fully tested with Java 1.8 and 11.

# Chapter 2. New Features

## 2.1. Cayenne Core is Dependency-Free

Cayenne now depends only on `slf4j-api` library. We removed `velocity`, `commons-lang` and `commons-collections` dependencies from the Cayenne core. Velocity templates replaced with a simplified (and also much faster) parser for the parts of the Velocity syntax essential for Cayenne.

This should be transparent in almost all case. See `UPGRADE.txt` for details.

## 2.2. Field-Based Data Objects

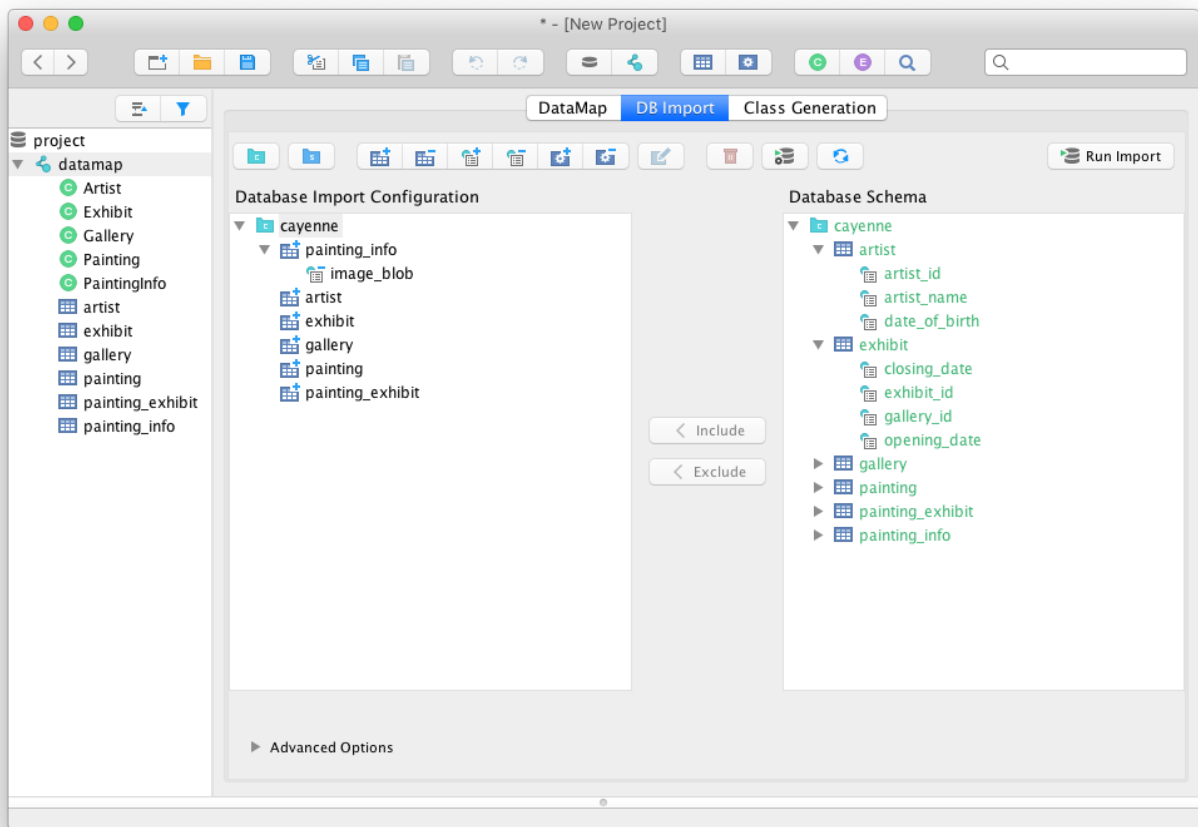
Cayenne 4.1 generates field-based DataObjects by default. And it is HUGE for the app performance. The new objects are much faster to read and write and significantly reduce the overall app memory footprint and the corresponding GC pauses.

The new objects are mostly backwards-compatible with our “classic” map-based objects from the application standpoint. The main source of incompatibility is support for “dynamic” properties (i.e. persistent properties not known at compile time).

Field-based DataObjects are generated via new class templates. So to take advantage of this feature you should simply regenerate you model classes.

## 2.3. Extensible Project XML Structure

Cayenne mapping project structure was modularized, allowing embedding of extensions with their own XML schemas. This enables support for comments for entities, attributes and relationships. Also Cayenne 4.1 have extensions for `cdbimport` and `cgen`, making OR modeling workflow experience so much smoother.



# Chapter 3. API Changes

## 3.1. Transaction propagation logic and isolation level

New API allows to fully control transaction behavior where it's needed.

```
TransactionManager manager = runtime.getInjector().getInstance(TransactionManager.class);
    TransactionDescriptor descriptor = new TransactionDescriptor(
        Connection.TRANSACTION_SERIALIZABLE, // set transaction isolation to
SERIALIZABLE
        TransactionPropagation.REQUIRES_NEW // require new transaction for every
operation
    );
    manager.performInTransaction(() -> {
        // perform some DB operations...
        return null;
    }, descriptor);
```

## 3.2. Injectable PkGenerator

All **PkGenerators** are now managed by DI so you can simply inject your own implementation.

```
ServerModule.contributePkGenerators(binder)
    .put(MySQLAdapter.class.getName(), CustomSQLPkGenerator.class);
```

## 3.3. DataChannelFilter replaced with DataChannelQueryFilter and DataChannelSyncFilter

**DataChannelFilter** is deprecated. Instead two separate filters are introduced.

```
ServerModule.contributeDomainQueryFilters(binder).add((context, query, chain) -> {
    // do something with query
    // ...
    return chain.onQuery(context, query);
});

ServerModule.contributeDomainSyncFilters(binder).add((context, changes, syncType,
chain) -> {
    // do something with changes
    // ...
    return chain.onSync(context, changes, syncType);
});
```