

Entity Mapping and Persistence

Entity Mapping Definition:

Entity mapping is the process of mapping objects in a programming language to tables in a relational database. It ensures that the data stored in objects is correctly translated to and from the database.

ORM Frameworks Overview:

ORM frameworks like Hibernate and JPA (Java Persistence API) simplify database interactions by handling object-to-database mapping automatically.

Advantages:

- Simplify database interactions.
- Reduce boilerplate code.
- Manage complex data relationships.

Annotations and XML Configuration Annotations:

ORM frameworks use annotations to define entity mappings. Examples include:

- **@Entity**: Marks a class as an entity.
- **@Table**: Specifies the table name.
- **@Id**: Defines the primary key.
- **@Column**: Maps fields to table columns.

. Persistence Definition:

Persistence is the capability of an application to store and retrieve objects from a database.

It involves managing the lifecycle of entities to ensure they are correctly saved and fetched from the database.

Persistence Context Definition: A persistence context is a set of entity instances where each persistent entity identity has a unique entity instance.

Lifecycle: Entities have different states: transient, persistent, detached, and removed.

Transient

Definition: An entity is in the transient state when it is created but not yet associated with any persistence context. It is not managed by the EntityManager and has not been saved to the database.

Persistent

Definition: An entity is in the persistent state when it is associated with a persistence context (managed by the EntityManager) and is synchronized with the database. Any changes made to the entity are tracked and will be updated in the database when the transaction commits.

Detached

Definition: An entity is in the detached state when it is no longer associated with a persistence context. This can occur if the EntityManager is closed or if the entity is explicitly detached. It is not automatically synchronized with the database anymore, and any changes made to it will not be persisted unless reattached.

Removed

Definition: An entity is in the removed state when it is marked for deletion from the database. The entity is still in the persistence context, but it will be deleted from the database when the transaction commits.

Entity Manager: The EntityManager interface in JPA provides methods to interact with the persistence context