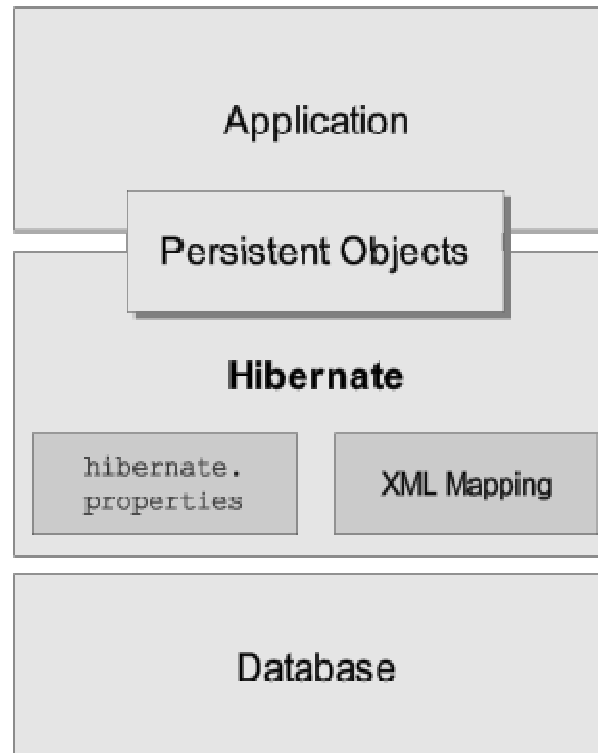


Annotations in



Remember the Structure



Hibernate Model

- ~~Hibernate Core~~ offers native API's & object/relational mapping with XML metadata
- ~~Hibernate Annotations~~ offers JDK 5.0 code annotations as a replacement or in addition to XML metadata
- ~~Hibernate EntityManager~~ involves standard JPA for Java SE and Java EE

JPA (Java Persistent API)

- JPA is a part of EJB 3.0 specification
- JPA is a POJO API for object/relational mapping that supports the use both of Java metadata annotations and/or XML metadata

What is Annotation ?

- **Annotation** is a specific construction in java 5 for adding additional information to Java source code
- **Annotations** are embedded in class files generated by compiler & can be used by other frameworks

Annotation Using Syntax

```
@AnnotationName (element1 =  
    "value1", element2 = "value2")
```

```
@AnnotationName ("value")
```

Can be used for

- classes
- methods
- variables
- parameters
- packages
- annotations

Hibernate Annotations

- Basic annotations that implement the JPA standard
- Hibernate extension annotations

Annotated Java class

```
• @Entity // Declares this an entity bean
• @Table(name = "people") // Maps the bean to SQL table "people"
• class Person implements Serializable{

• @Id // Map this to the primary key column.
• @GeneratedValue(strategy = GenerationType.AUTO) // Database will generate new primary keys
• private Integer id;

• @Column(length = 32) // Truncate column values to 32 characters.
• private String name;

• public Integer getId() {
•     return id;
• }

• public void setId(Integer id) {
•     this.id = id;
• }

• public String getName() {
•     return name;
• }

• public void setName(String name) {
•     this.name = name;
• }
}
```

Basic Annotations

- `@Entity` Declares this an entity bean
 - `@Id` Identity
 - `@EmbeddedId`
 - `@GeneratedValue`
 - `@Table` Database Schema Attributes
 - `@Column`
 - `@OneToOne` Relationship mappings
 - `@ManyToOne`
 - `@OneToMany`
- & etc.

Extension Annotations

- Contained in `org.hibernate.annotations` package
- Examples:
 - `@org.hibernate.annotations.Entity`
 - `@org.hibernate.annotations.Table`
 - `@BatchSize`
 - `@Where`
 - `@Check`
 - `& .etc`

hibernate.cfg.xml

```
<hibernate-configuration>
  <session-factory>
    <property
      name="hibernate.connection.driver_class">org.hsqldb.jdbcDriver</property>
    <property name="hibernate.connection.url">jdbc:hsqldb:hsq://localhost/
</property>
    <property name="hibernate.connection.username">sa</property>

    <property
      name="dialect">org.hibernate.dialect.HSQLDialect</property>

    <mapping class="hello.Person"/>
  </session-factory>
</hibernate-configuration>
```

----- !!! -----

Maven – pom.xml - dependencies

```
<dependency>  
  <groupId>org.hibernate</groupId>  
  <artifactId>hibernate-core</artifactId>  
  <version>3.6.8.Final</version>  
</dependency>
```

- Easier compared to version 3.3.x

Maven – pom.xml - repositories

```
<repository>
  <id>jboss-public-repository-group</id>
  <name>JBoss Public Maven Repository Group</name>
  <url>https://repository.jboss.org/nexus/content/groups/public-jboss/</url>
  <layout>default</layout>
  <releases>
    <enabled>true</enabled>
    <updatePolicy>never</updatePolicy>
  </releases>
  <snapshots>
    <enabled>true</enabled>
    <updatePolicy>never</updatePolicy>
  </snapshots>
</repository>
```

Hibernate Class Entities

- Class attributes
 - Hibernate uses reflection to populate
 - Can be private or whatever
- Class requirements
 - Default constructor (private or whatever)
 - “However, package or public visibility is required for runtime proxy generation and efficient data retrieval without bytecode instrumentation.”
- JavaBean pattern common
 - Not required though but easier
- 3 methods of serialization definition
 - Following slides

Hibernate Annotation Mappings

- Annotations in code
 - Beginning of class
 - Indicate class is Entity
 - Class doesn't have to implement `java.lang.Serializable`
 - Define database table
 - Define which attributes to map to columns
 - Supports auto-increment IDs too
 - Can dictate value restrictions (not null, etc)
 - Can dictate value storage type
- Existed before JPA standard (later slides)
- Doesn't require a separate `hbm.xml` mapping file (discussed later)
 - But is tied to code

Hibernate Annotation Example

```
@Entity
@Table( name = "EVENTS" )
public class Event {
    private Long id;
    ...

    @Id
    @GeneratedValue(generator="increment"
    @GenericGenerator(name="increment", strategy = "increment")
    public Long getId() { return id;  }

    @Temporal(TemporalType.TIMESTAMP)
    @Column(name = "EVENT_DATE")
    public Date getDate() { return date;  }
    public void setDate(Date date) { this.date = date;  }
    ...
}
```

Hibernate Annotation Example (8)

Tells hibernate this goes into the
EVENTS table

```
@Entity
@Table( name = "EVENTS" )
public class Event {
    private Long id;
    ...

    @Id
    @GeneratedValue(generator="increment"
    @GenericGenerator(name="increment", strategy = "increment")
    public Long getId() { return id; }

    @Temporal(TemporalType.TIMESTAMP)
    @Column(name = "EVENT_DATE")
    public Date getDate() { return date; }
    public void setDate(Date date) { this.date = date; }
    ...
}
```

Hibernate Annotation Example (2)

Tells hibernate that this is an auto generated field for the database

```
@Entity
@Table( name = "EVENT", schema = "EVENT_SCHEMA")
public class Event {
    private Long id;
    ...

    @Id
    @GeneratedValue(generator="increment")
    @GenericGenerator(name="increment", strategy = "increment")
    public Long getId() { return id; }

    @Temporal(TemporalType.TIMESTAMP)
    @Column(name = "EVENT_DATE")
    public Date getDate() { return date; }
    public void setDate(Date date) { this.date = date; }
    ...
}
```

Hibernate Annotations

Note that you don't need any annotations on the actual private fields or setters if you use the standard JavaBean pattern. The getter defines it.

```
@Entity
@Table( name = "EVENTS" )
public class Event {
    private Long id;
    ...

    @Id
    @GeneratedValue(generator="increment"
    @GenericGenerator(name="increment", strategy = "increment")
    public Long getId() { return id;  }

    @Temporal(TemporalType.TIMESTAMP)
    @Column(name = "EVENT_DATE")
    public Date getDate() { return date;  }

    public void setDate(Date date) { this.date = date;  }

    ...
}
```

Hibernate Annotations

Also note that this is automatically stored with a column name of "title" so we didn't have to add any annotations

```
@Entity
@Table( name = "EVENTS" )
public class Event {
    ...
    private String title;

    public String getTitle() {    return title;    }

    public void setTitle(String title) {    this.title = title;    }
    ...
}
```

JPA Annotation

- ~~Became standard~~
 - ~~– Came after Hibernate annotations~~
- ~~Works almost like Hibernate annotations~~
 - Requires “META-INF/persistence.xml” file
 - Defines data source configuration
 - HibernatePersistence provider
 - Auto-detects any annotated classes
 - Auto-detects any hbm.xml class mapping files
 - (later slides)
 - Allows explicit class loading for mapping
- Annotation syntax
 - Same as Hibernate
 - Hibernate has a few extensions (see docs)