



CS544 EA

Hibernate

Lazy and Eager

What is Lazy (or Eager)?

- Lazy means it does not load it
 - Until it absolutely needs it
 - By default all **Collections** (*ToMany) **are lazy**
- Eager gets loaded right away
 - As soon as it knows about it
 - By default all **references** (*ToOne) **are eager**

Changing FetchType

- It's **possible to change**
 - References to LAZY
 - collections to EAGER
- Generally not needed

```
@Entity
public class Customer {
    @Id
    @GeneratedValue
    private Long id;
    private String firstName;
    private String lastName;
    @ManyToOne(fetch=FetchType.LAZY)
    private SalesRep salesRep;
    @OneToMany(fetch=FetchType.LAZY)
    @JoinColumn
    private List<Book> books
        = new ArrayList<>();
}
```

LAZY

LAZY or EAGER

- Some say that all associations should be lazy
 - EAGERly loaded objects may never be used
- Usually Hibernate loads *ToOne with Joins
 - Less expensive than separate selects
 - Still takes overhead, wasted if object not used
- On the whole **you can be safe never modifying**
 - Premature optimization is the root of all evil

@LazyCollection

- A Hibernate extension that:
 - Can be useful **for big collections**
- By default the entire collection is retrieved for:
 - .size(), .isEmpty(), .contains()
 - Instead of **using the DB** to count / check
 - 'Extra lazy' fixes that

@LazyCollection

```
import org.hibernate.annotations.LazyCollection;
import org.hibernate.annotations.LazyCollectionOption;
```

```
@Entity
public class Customer {
    @Id
    @GeneratedValue
    private Long id;
    private String firstName;
    private String lastName;
    @OneToMany(cascade=CascadeType.ALL)
    @JoinColumn
    @LazyCollection(LazyCollectionOption.EXTRA)
    private List<Movie> movies
        = new ArrayList<>();
}
```

Extra Lazy

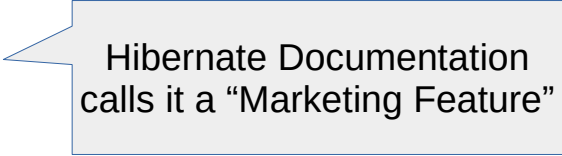
```
Customer c = em.find(Customer.class, 1L);
System.out.println(c.getMovies().size());
```

```
Hibernate:
select
    customer0_.id as id1_1_0_,
    customer0_.firstName as firstNam2_1_0_,
    customer0_.lastName as lastName3_1_0_,
    customer0_.salesRep_id as salesRep4_1_0_
from
    Customer customer0_
where
    customer0_.id=?
```

```
Hibernate:
select
    count(id)
from
    Movie
where
    movies_id =?
```

Lazy Properties

- It is possible to make **individual properties lazy**
 - Needs Property access (getters)
 - `@Basic(fetch=FetchType.LAZY)` (on getters)
- **Needs ByteCode instrumentation** to work
 - Rewrites your getters (after compilation) for ability to load data
- Generally not recommended
 - **DTO projection is better** / easier solution



Hibernate Documentation
calls it a “Marketing Feature”

ByteCode Instrumentation Ant file

```
<?xml version="1.0" encoding="UTF-8"?>
<project name="ByteCodeInstrument" default="instrument">
  <description>Byte Code instrument example</description>
  <property name="src" location="src" />
  <property name="build" location="bin" />

  <target name="compile">
    <javac srcdir="${src}" destdir="${build}" />
  </target>

  <target name="instrument" depends="compile">
    <taskdef name="instrument"
      classname="org.hibernate.tool.instrument.cglib.InstrumentTask">
      <classpath>
        <fileset dir="c:/hibernatetraining/libraries/">
          <include name="**/*.jar" />
        </fileset>
      </classpath>
    </taskdef>
    <instrument verbose="true">
      <fileset dir="${build}/when/properties/">
        <include name="**/*.class" />
      </fileset>
    </instrument>
  </target>
</project>
```


Lazy Properties

```
@Entity
public class Book {
    ...

    @Id
    public String getIsbn() { return isbn; }
    public String getTitle() { return title; }
    public String getAuthor() { return author; }

    @Basic(fetch=FetchType.LAZY)
    public java.sql.Clob getSummary() {
        return summary;
    }

    @Basic(fetch=FetchType.LAZY)
    public java.sql.Blob getCover() {
        return cover;
    }
}
```

Annotations on getters

```
Book b = (Book)session.get(Book.class, "978-0545139700");
System.out.println(b.getTitle());
```

```
java.sql.Clob sumData = b.getSummary();
int length = (int)sumData.length();
System.out.println(sumData.getSubString(1, length));
```

```
Hibernate:
select
    book0_.isbn as isbn0_0_,
    book0_.title as title0_0_,
    book0_.author as author0_0_
from
    Book book0_
where
    book0_.isbn=?
```

Harry Potter and the Deathly Hallows

```
Hibernate:
select
    book_.summary as summary0_,
    book_.cover as cover0_
from
    Book book_
where
    book_.isbn=?
```

Loads Summary when needed

Also loads cover

Readers beware. The brilliant,
breathtaking conclusion to J.K.
Rowling's spellbinding series is not for
the faint of heart

Instead use DTO Projection

- Already discussed during **SELECT new Object**
 - Can select (project) only the properties you need
 - Better than lazy-loading properties!

```
TypedQuery<Home> query = em.createQuery(
    "select new hibernate06.Home(p, a) "
    + "from Person p " + "join p.address a ", Home.class);
List<Home> homes = query.getResultList();

Person p = null;
Address a = null;
for (Home home : homes) {
    p = home.getPerson();
    a = home.getAddress();

    System.out.println(p.getFirstName()
        + " " + p.getLastName()
        + " has a home in " + a.getCity());
}
```

```
public class Home {
    private Person person;
    private Address address;

    public Home(Person p, Address a) {
        this.person = p;
        this.address = a;
    }
}
```

Not an Entity
but a DTO class

Lazy and Eager Summary

- Lazy and Eager **specify WHEN not HOW**
 - When is generally not the problem
- It's good to know about these options
 - To understand how Hibernate works
 - While not the biggest source of problems or solutions