

Lecture 23: Level 2 Cache Using EHCache

Theory

Level 2 (L2) cache operates at the SessionFactory level, providing application-wide caching capabilities that persist across different sessions.

Cache Hierarchy

- **L1 Cache:** Session-level (automatic)
- **L2 Cache:** SessionFactory-level (requires configuration)

Dependencies Setup

Required Dependencies in pom.xml:

```
<dependency>
  <groupId>org.ehcache</groupId>
  <artifactId>ehcache</artifactId>
</dependency>

<dependency>
  <groupId>org.hibernate</groupId>
  <artifactId>hibernate-jcache</artifactId>
</dependency>
```

Configuration Implementation

hibernate.cfg.xml Configuration:

xml

```
<hibernate-configuration xmlns="http://www.hibernate.org/xsd/orm/cfg">
  <session-factory>
    <!-- Database connection properties -->
    <property name="hibernate.connection.driver_class">org.postgresql.Driver</property>
    <property
name="hibernate.connection.url">jdbc:postgresql://localhost:5432/telusko</property>
    <property name="hibernate.connection.username">postgres</property>
    <property name="hibernate.connection.password">5000</property>

    <!-- Hibernate properties -->
    <property name="hibernate.hbm2ddl.auto">update</property>
    <property
name="hibernate.dialect">org.hibernate.dialect.PostgreSQLDialect</property>
    <property name="hibernate.show_sql">true</property>
    <property name="hibernate.format_sql">true</property>

    <!-- L2 Cache Configuration -->
```

```

        <property name="hibernate.cache.use_second_level_cache">true</property>
        <property
name="hibernate.cache.region.factory_class">org.hibernate.cache.jcache.JCacheRegionFa
ctory</property>
        <property
name="hibernate.jakarta.cache.provider">org.ehcache.jsr107.EhcacheCachingProvider</pr
operty>
    </session-factory>
</hibernate-configuration>

```

Code Implementation

Modern Session Usage:

```

// Using modern find() method instead of deprecated get()
Laptop l1 = session1.find(Laptop.class, 2);
System.out.println(l1);

```

L2 Cache Benefits

Performance Advantages:

- **Cross-Session Sharing:** Data cached across multiple sessions
- **Reduced Database Hits:** Frequently accessed data served from cache
- **Application-Level Optimization:** Improves overall application performance

Cache Levels Comparison:

Feature	L1 Cache	L2 Cache
Scope	Single Session	SessionFactory-wide
Lifetime	Session duration	Application lifetime
Configuration	Automatic	Manual setup required
Sharing	No sharing	Shared across sessions
Provider	Built-in Hibernate	EHCache, Hazelcast, etc.

Implementation Steps:

1. **Add Dependencies:** Include ehcache and hibernate-jcache
2. **Configure Properties:** Enable L2 cache in hibernate.cfg.xml
3. **Entity Annotation:** Add @Cache annotation to entities
4. **Provider Setup:** Configure cache provider (EHCache)

Cache Strategy Options:

- **READ_ONLY**: For immutable data
- **READ_WRITE**: For mutable data with read/write operations
- **NONSTRICT_READ_WRITE**: For rarely updated data
- **TRANSACTIONAL**: For transactional cache operations