Saving Time and Money with Spring-Data-Eclipse-Store

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- Atomic Power Plant
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- Institute for Information Systems (iisys)

XDEV

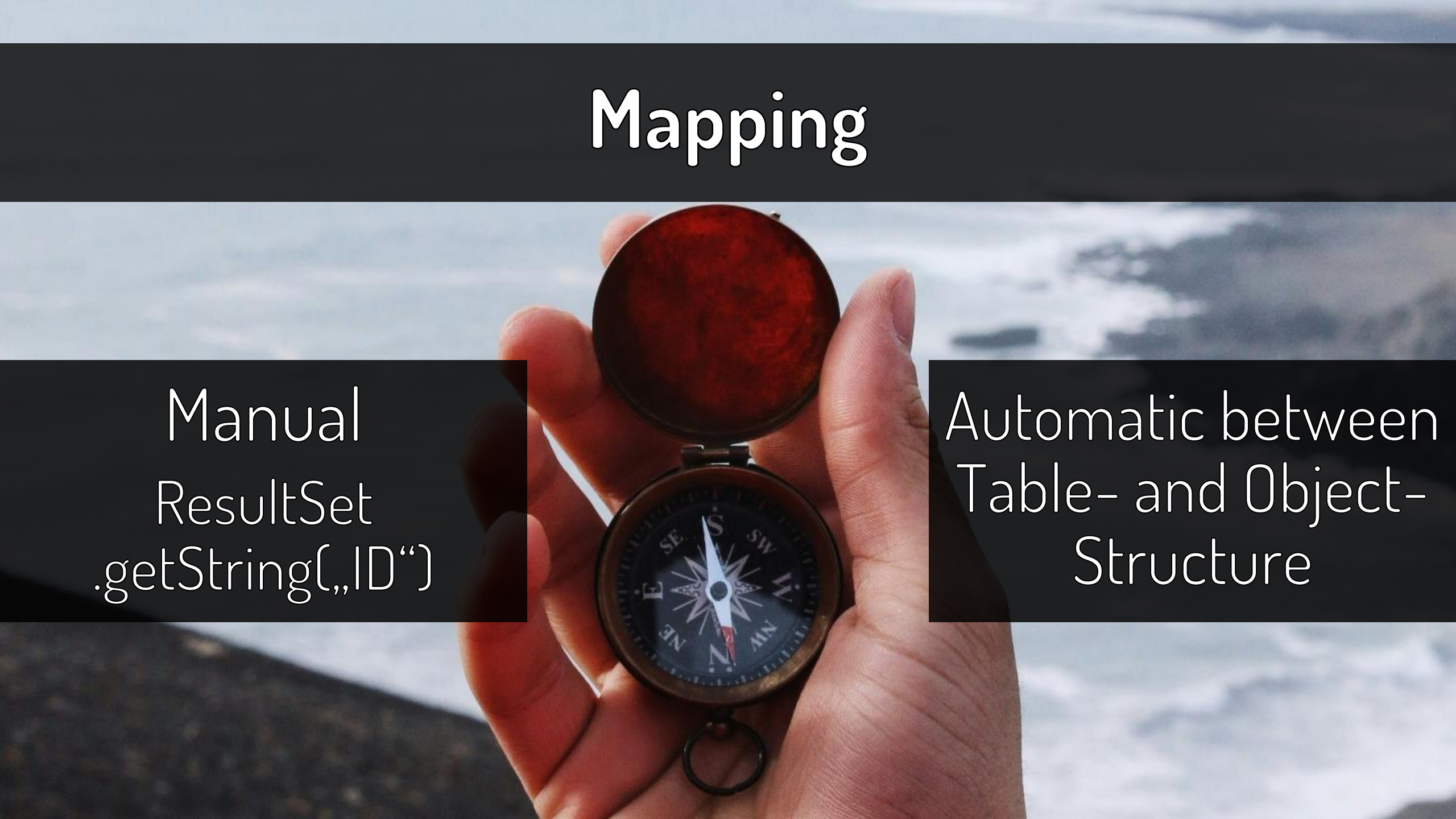
- Custom software for customers
- Open source contributer
- https://github.com/JohannesRabauer

SQL and JPA are difficult

```
Connection conn = DriverManager.getConnection("jdbc:mysql://localhost:3306/“);
String sql = "SELECT * FROM user WHERE id = ?";
PreparedStatement ps = con.prepareStatement(sql);
ps.setString(1, „1");
ResultSet result = ps.executeQuery();
```

```
public UserEntity getUserByIdWithCriteriaQuery(Long id) {
    CriteriaBuilder criteriaBuilder = getEntityManager().getCriteriaBuilder();
    CriteriaQuery<UserEntity> criteriaQuery = criteriaBuilder.createQuery(UserEntity.class);
    Root<UserEntity> userRoot = criteriaQuery.from(UserEntity.class);
    UserEntity queryResult =
        getEntityManager()
                .createQuery(criteriaQuery.select(userRoot)
                .where(criteriaBuilder.equal(userRoot.get("id"), id)))
                .getSingleResult();
    return queryResult;
}
```

Mapping



Manual

ResultSet
.getString(„ID“)

Automatic between Table- and Object-Structure

EclipseStore

- Fast
- Can update parts of graph
- Different store targets
- Lazy-Loading

Example

```
final public class Root{
        private final List<Product> products = new ArrayList<>();
        private final Lazy<BigObject> someBigObject = Lazy.Reference(new BigObject());

        public List<Product> getProducts(){…}
}

public record Product(String name){}
```

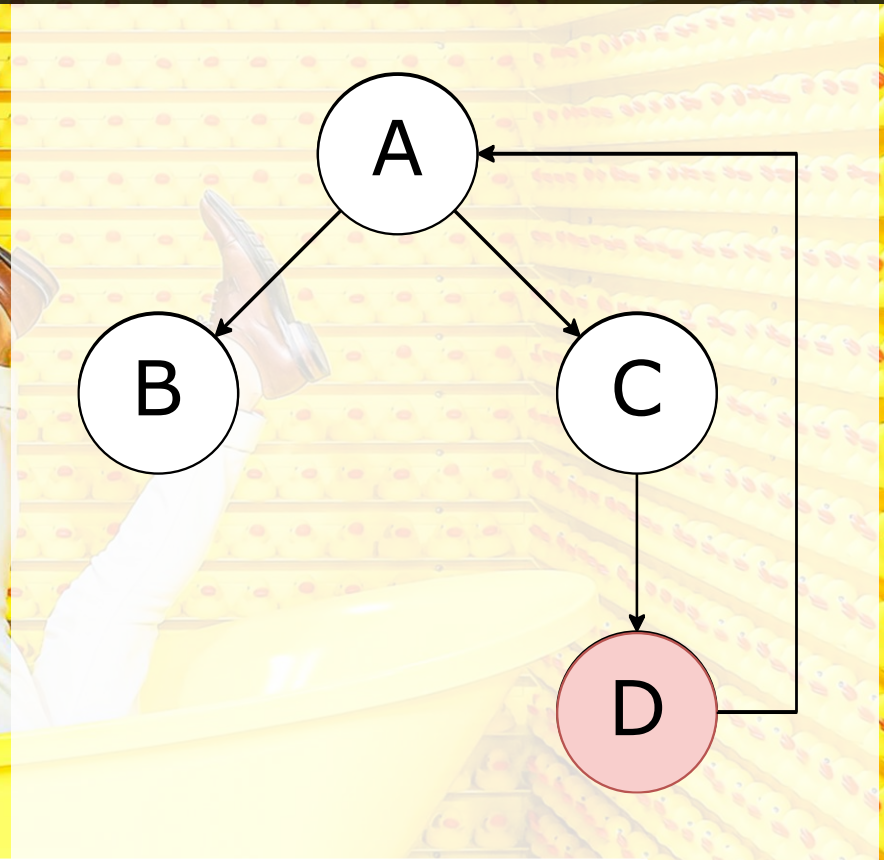
```
final Root rootObject = new Root();
final EmbeddedStorageManager storageManager = EmbeddedStorage.start(rootObject);


rootObject.getProducts().add(new Product(„Chair“));
storageManager.store(rootObject.getProducts());


storageManager.shutdown();
```

Differences

	JDBC	JPA	EclipseStore
Persistence	Seperate server	Seperate server	Local, seperate server, Cloud
Querying	SQL	SQL, Criteria Query	Pure Java
Parsing/Mapping	Manual	Automatic	Automatic

Acceptance?

First name	Last name	Birth place
Mick	Fleetwood	Redruth
Stevie	Nicks	Phoenix




```
…
rootObject.getProducts().add(new Product(„Chair“));
storageManager.store(rootObject.getProducts());
…
```

Gap

First name	Last name	Birth place
Mick	Fleetwood	Redruth
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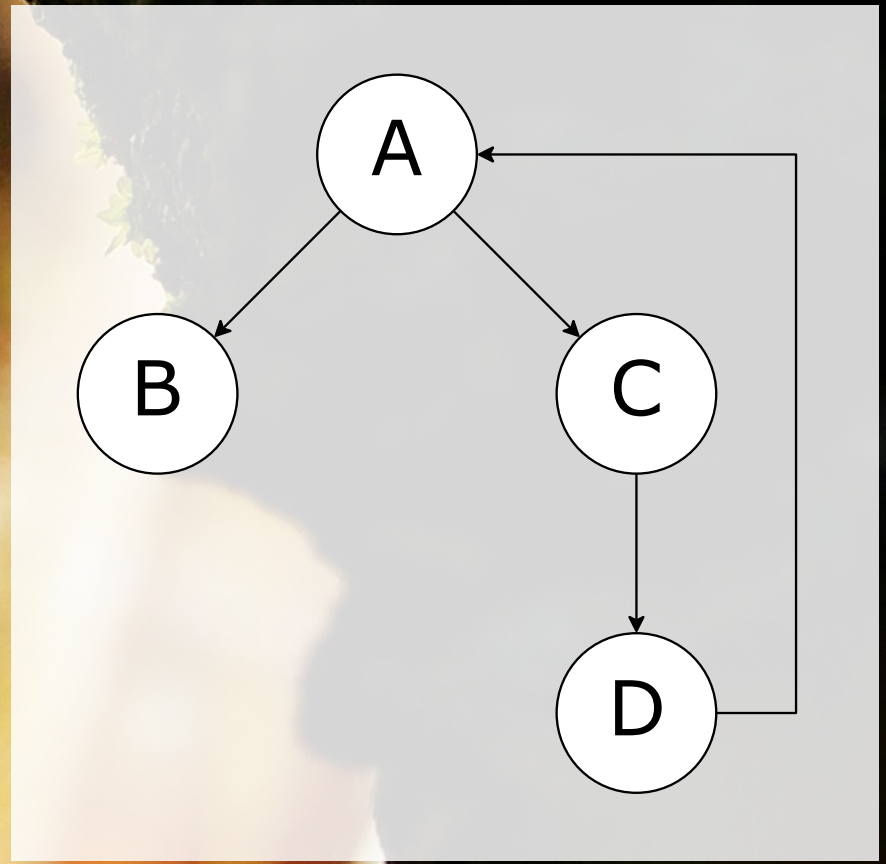

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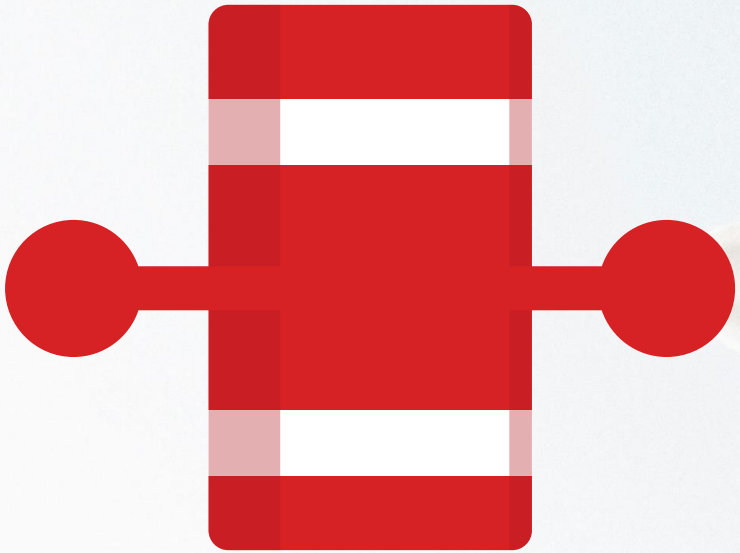


SPRINGDATA ECLIPSESTORE

Spring Data

- Plenty of modules: JPA, MongoDB, Redis, …
- Powerful repository and custom object-mapping abstractions

```
public interface SimpleUserRepository extends ListCrudRepository<User, Long> {}
```

```
simpleUserRepository.save(new User(…));
```

- Dynamic query derivation from repository method names

```
public interface SimpleUserRepository extends ListCrudRepository<User, Long> {
        Optional<User> findByUsername(Optional<String> username);
        List<User> findByLastname(String lastname);
…}
```

- Repositories coming to Jakarta with Jakarta Data 1.0

Get started

- Download Spring Boot project with Maven and Java from https://start.spring.io/
- Add to pom.xml

```
<dependency>
    <groupId>software.xdev</groupId>
    <artifactId>spring-data-eclipse-store</artifactId>
    <version>1.0.2<version>
</dependency>
```

- Add to SpringBootApplication

```
@SpringBootApplication
@EnableEclipseStoreRepositories
```

Code example

```
public record Pet(String name){}
```

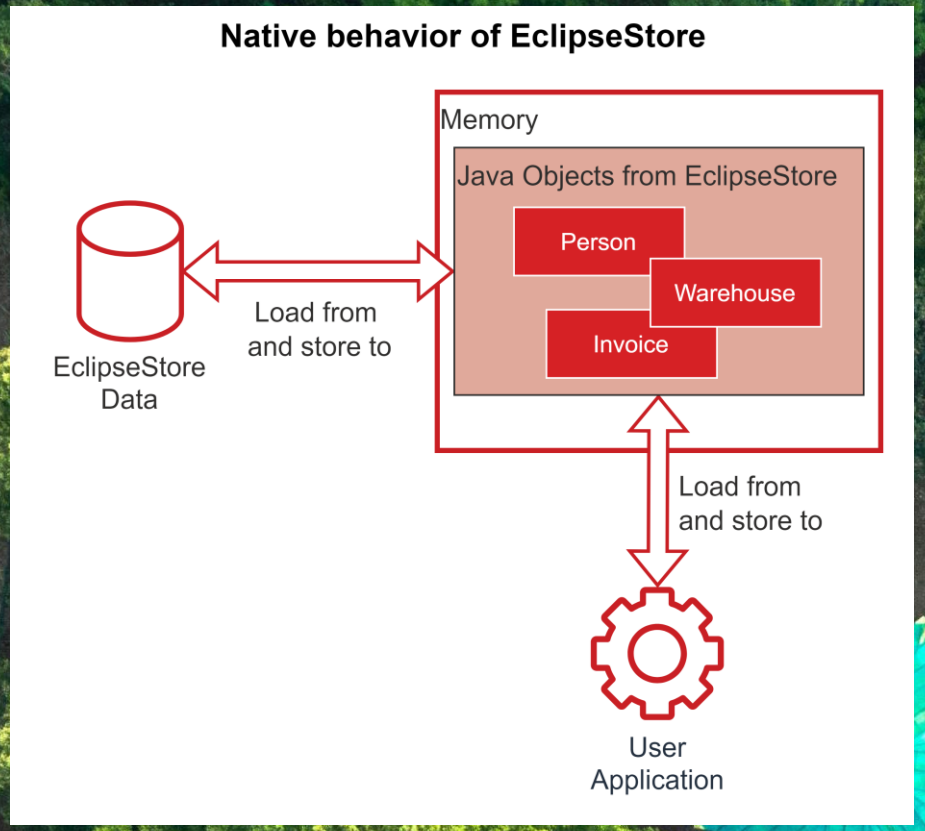
```
public record Owner(String firstName, String lastName, ArrayList<Pet> pets){}
```

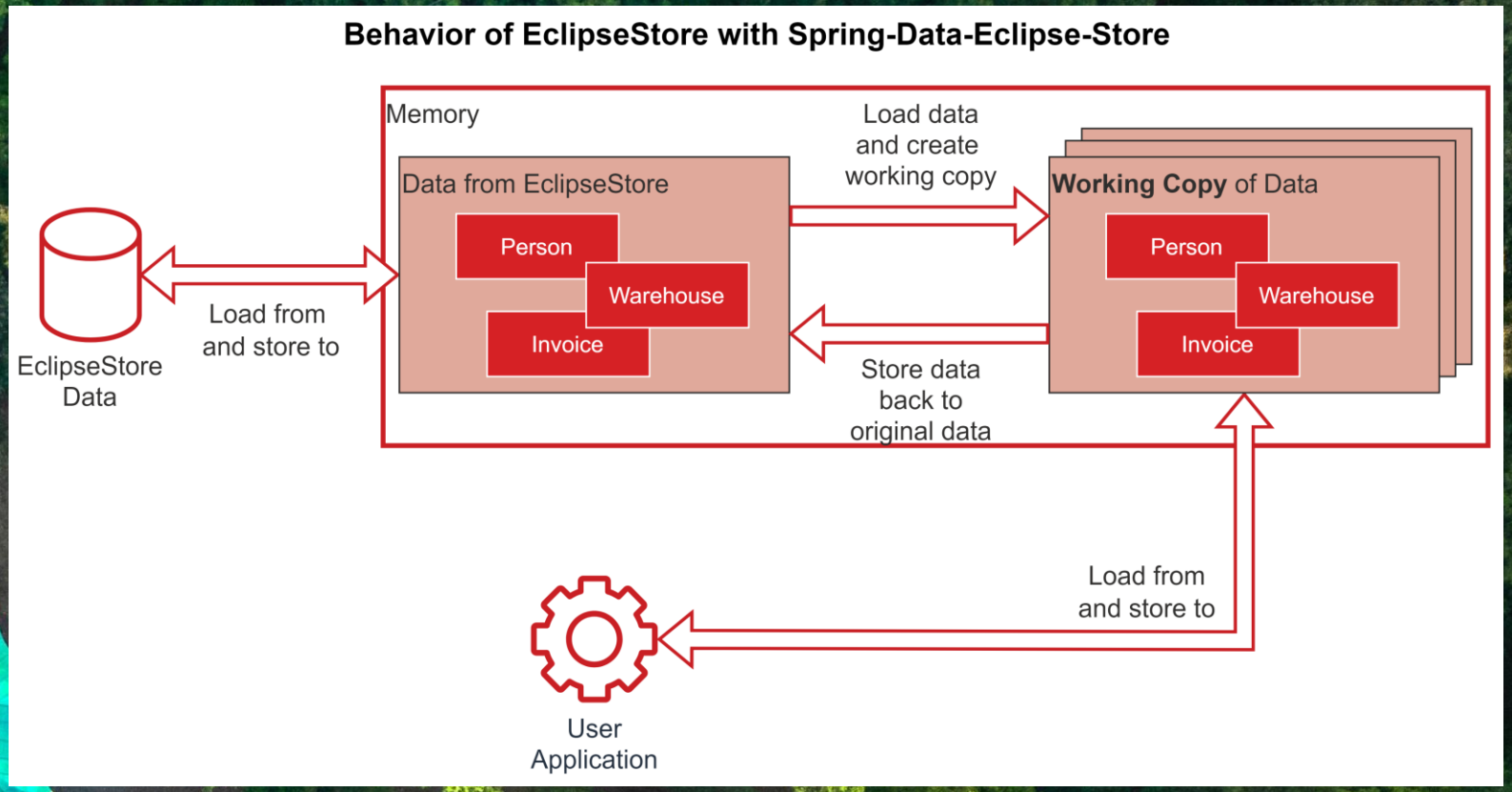
```
public interface OwnerRepository extends CrudRepository<Owner, String>{}
```

```
public class DemoApplication{
  @Override
  public void run(final String... args)
  {
    Owner stevieNicks = new Owner("Stevie", "Nicks", List.of(new Pet(„Catsy“));
    this.ownerRepository.save(stevieNicks);

    this.ownerRepository.findAll().forEach(o -> LOG.info(o.toString()));
  …
```

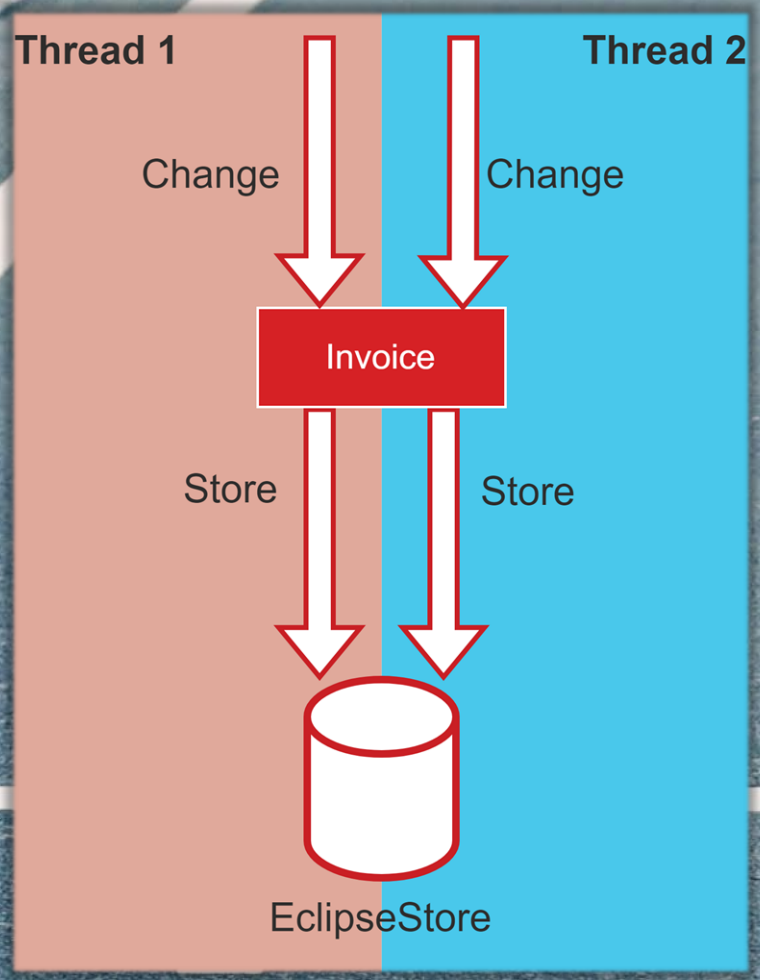
Core Difference

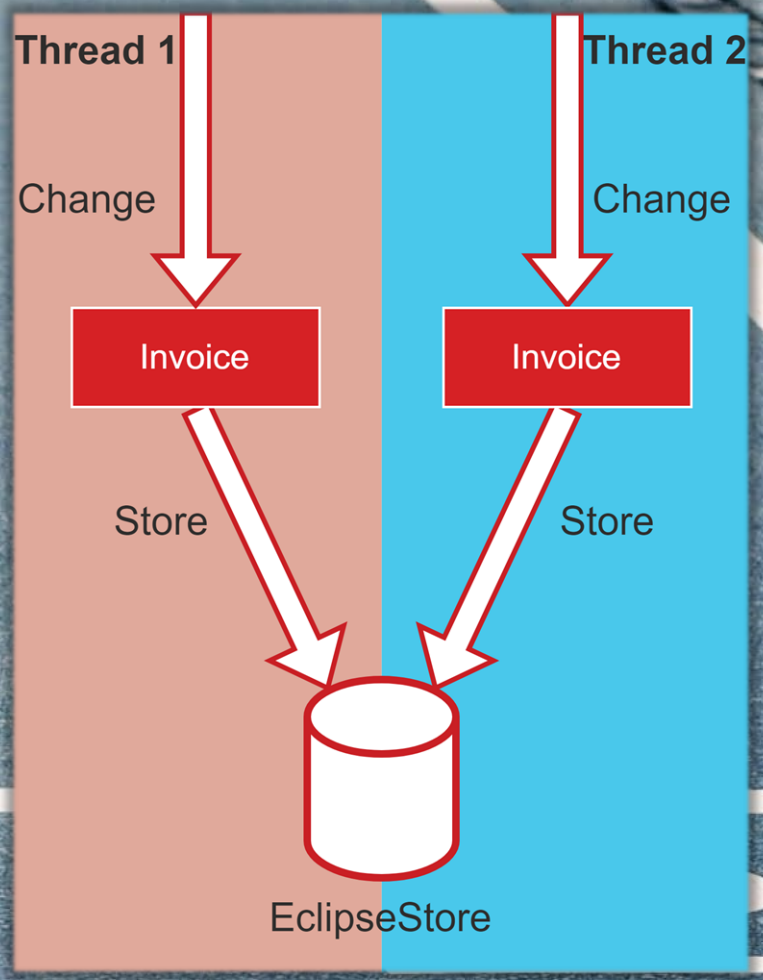




1. Principle of Least Surprise
2. Concurrency

Concurrency





Migration

- Can coexist with Spring JPA

```
public interface OwnerRepository extends CrudRepository<Owner, String>{}
```

```
public interface OwnerRepository extends EclipseStoreCrudRepository<Owner, String>{}
```

- Migrate Data with `EclipseStoreDataImporter`
- OpenRewrite Migration recipe: https://github.com/xdev-software/spring-data-eclipse-store-migration

```
mvn org.openrewrite.maven:rewrite-maven-plugin:run
-Drewrite.recipeArtifactCoordinates=software.xdev:spring-data-eclipse-store-migration:1.0.0
-Drewrite.activeRecipes=software.xdev.spring.data.eclipse.store.JpaMigration
```

Downsides

- Higher memory usage than EclipseStore
- Lazy not usable (Todo)
- Queries not usable (Todo)
- Startup time can be slow with gigabytes of data

How to save time and money?

Time

- Java native
- Object oriented
- Minimal code overhead
- Familiar behavior in Spring Data
- Fast

Money

- Open source
- Serverless storage possible

Sources / Further Reading

- Repository with demo and presentation: https://github.com/JohannesRabauer/talk-2024-spring-data-eclipse-store
- SDES Repository: https://github.com/xdev-software/spring-data-eclipse-store
- https://eclipsestore.io/
- https://spring.io/projects/spring-data
- Jakarta Data: https://jakarta.ee/specifications/data/
- SDES Migration Repository: https://github.com/xdev-software/spring-data-eclipse-store-migration
- Article: https://foojay.io/today/minimize-costs-by-utilizing-cloud-storage-with-spring-data-eclipse-store
- Images from https://unsplash.com/