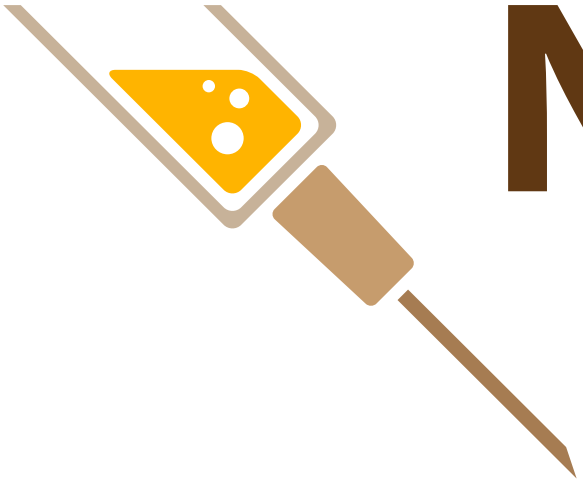

NEEDLE

for Java EE

Need(le) for Speed – Effective Unit Testing for Java EE

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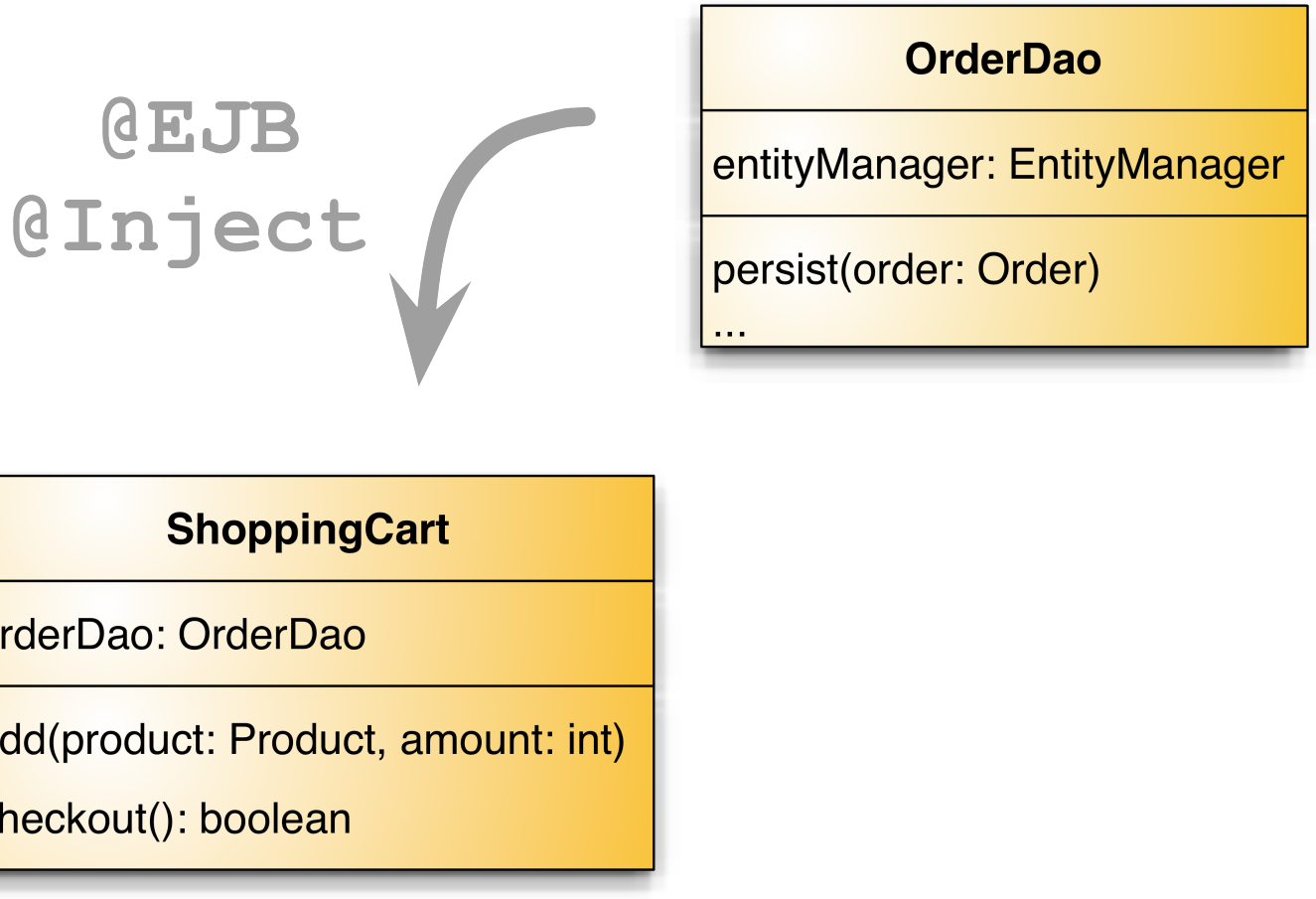
Why do we Test?

- Confidence
- Cost Reduction
- Better Design
- Documentation
- Less Debug Time

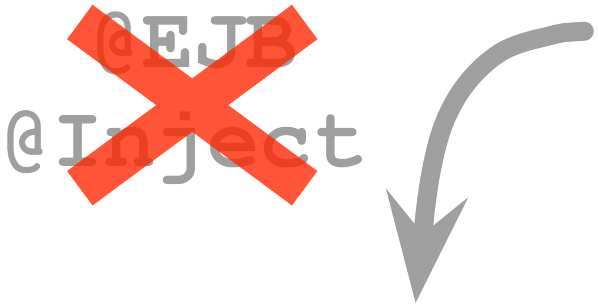
The levels of testing

- Unit
- Integration
- Acceptance

Runtime environment



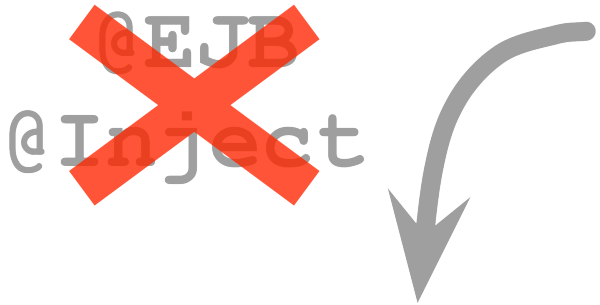
Unit-Test environment



OrderDao
entityManager: EntityManager
persist(order: Order) ...

ShoppingCart
orderDao: OrderDao
add(product: Product, amount: int) checkout(): boolean

Unit-Test environment



OrderDao
entityManager: EntityManager
persist(order: Order) ...

```
OrderDao mock =
   mock(OrderDao.class);
```

ShoppingCart
orderDao: OrderDao
add(product: Product, amount: int) checkout(): boolean

```
new ShoppingCart();
```

Breaking the encapsulation

```
public class ShoppingCart {

    @Inject
    protected OrderDao orderDao;

    ...

}
```

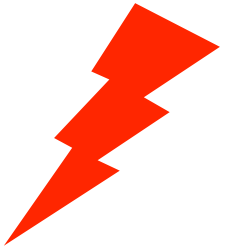
Breaking the encapsulation

```
public class ShoppingCart {

    @Inject
    private OrderDao orderDao;

    ...

    /*
     * for unit test only
     */
    protected void setOrderDao(OrderDao dao){
       orderDao = dao;
    }
}
```



Using reflection


```
public class ShoppingCartTest {

    private ShoppingCart shoppingCart;
    private OrderDao mock;

    @Before
    public void setup() throws Exception {
        shoppingCart = new ShoppingCartService();
        mock = mock(OrderDao.class);

        Field field = ShoppingCart.class.getDeclaredField("orderDao");
        field.setAccessible(true);
        field.set(shoppingCart, mock);
    }

    @Test
    public void testCheckout() {
        ...
    }
}
```

Effective Unit Testing for Java EE

- out of container testing
- test components in isolation

- reduce test setup code
- analyze dependencies and provide mocks

- Fast in development and execution

Need(le) for Speed


```
public class ShoppingCartTest {

   @Rule
   public NeedleRule needleRule = new NeedleRule();

   @ObjectUnderTest
   private ShoppingCart shoppingCart;

   @Test
   public void testCheckout() {
      boolean checkout = shoppingCart.checkout();
      assertTrue(checkout);
    }
}
```

Instantiation of `@ObjectUnderTest`

Components

Dependency Injection

- Field
- Method
- Constuctor

Default are Mock Objects

Injection Provider

Out-of-the-box

`@Inject, @EJB, @Resource, @PersistenceContext, @PersistenceUnit`

Configuration of additional Annotations

- e.g. Seam 2 - `@In, @Logger`

Configuration of additional injection provider

- e.g. `javax.inject.Qualifier`

Mock injection


```
public class ShoppingCartTest {

    @Rule
    public NeedleRule needleRule = new NeedleRule();

    @ObjectUnderTest
    private ShoppingCart shoppingCart;

    @Inject
    private OrderDao orderDaoMock;

    @Test
    public void testCheckout() {
      when(orderDaoMock.find(anyLong())).thenReturn(new Order());

      boolean checkout = shoppingCart.checkout();
      assertTrue(checkout);
    }
}
```

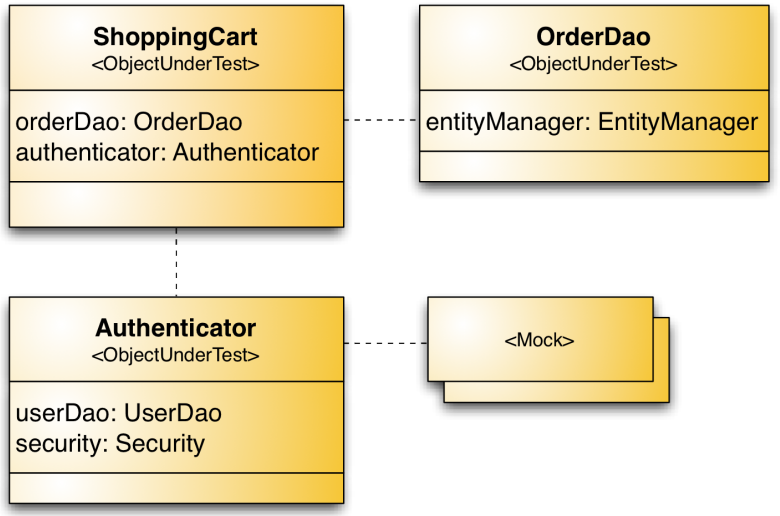
Testing object graphs

Provide own objects

Multiple `@ObjectUnderTest` Components

Wiring complex object graph

- `@InjectInto`
- `@InjectIntoMany`



Database testing

via JPA Provider, e.g. EclipseLink or Hibernate

EntityManager creation and injection

Optional: Execute Database operation on test setup and teardown

- Import SQL Scripts
- Deleting test data after the test execution

```
public class OrderDaoTest {

  @Rule
  public DatabaseRule dbRule = new DatabaseRule();

  @Rule
  public NeedleRule needleRule = new NeedleRule(dbRule);

  @ObjectUnderTest
  private OrderDao orderDao;

  @Test
  public void testFind() {
    Order order =
            new OrderTestdataBuilder().buildAndSave();
    Order orderFromDb = orderDao.find(order.getId());
    assertEquals(checkout);
  }
}
```

JPA

CDI

DEMO

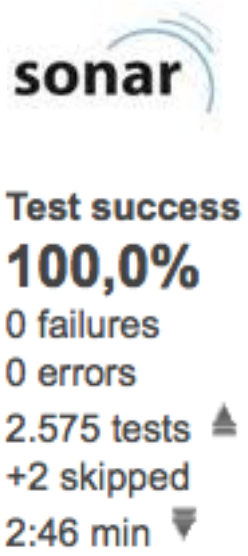
EJB

JSF

http://seam-archetype.sourceforge.net/jbosscc-seam-archetype/1.4/javaee.html

Summary

Fast
Less Glue Code
Keep Dependencies Private
Flexible & Extensible
Developer Happiness ;-)



Get Started Today!

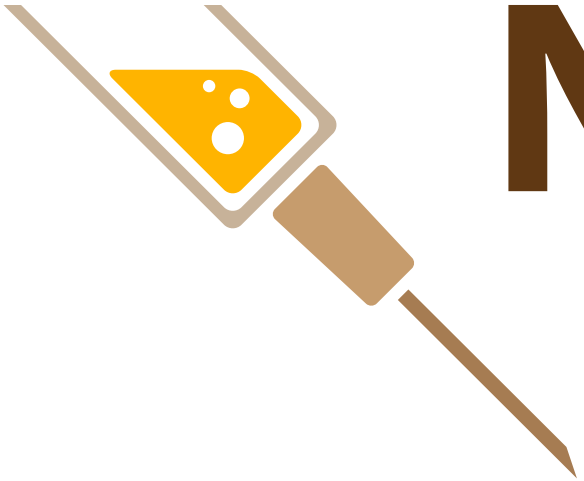
```
<dependency>
   <groupId>de.akquinet.jbosscc</groupId>
   <artifactId>jbosscc-needle</artifactId>
   <version>2.1</version>
   <scope>test</scope>
</dependency>
```

http://needle.spree.de

http://sourceforge.net/projects/jbosscc-needle/

heinz.wilming@akquinet.de

http://blog.akquinet.de/



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