NEDERLANDSE JAVA USER GROUP

JSpring 2004

Mock objects as testing method

TRAINING & CONSULTING

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Instructor

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Outline

- Introduction JUnit
- Sample application
- Introduction Mock objects
- Testing with Mock objects
- Conclusions

Introduction JUnit

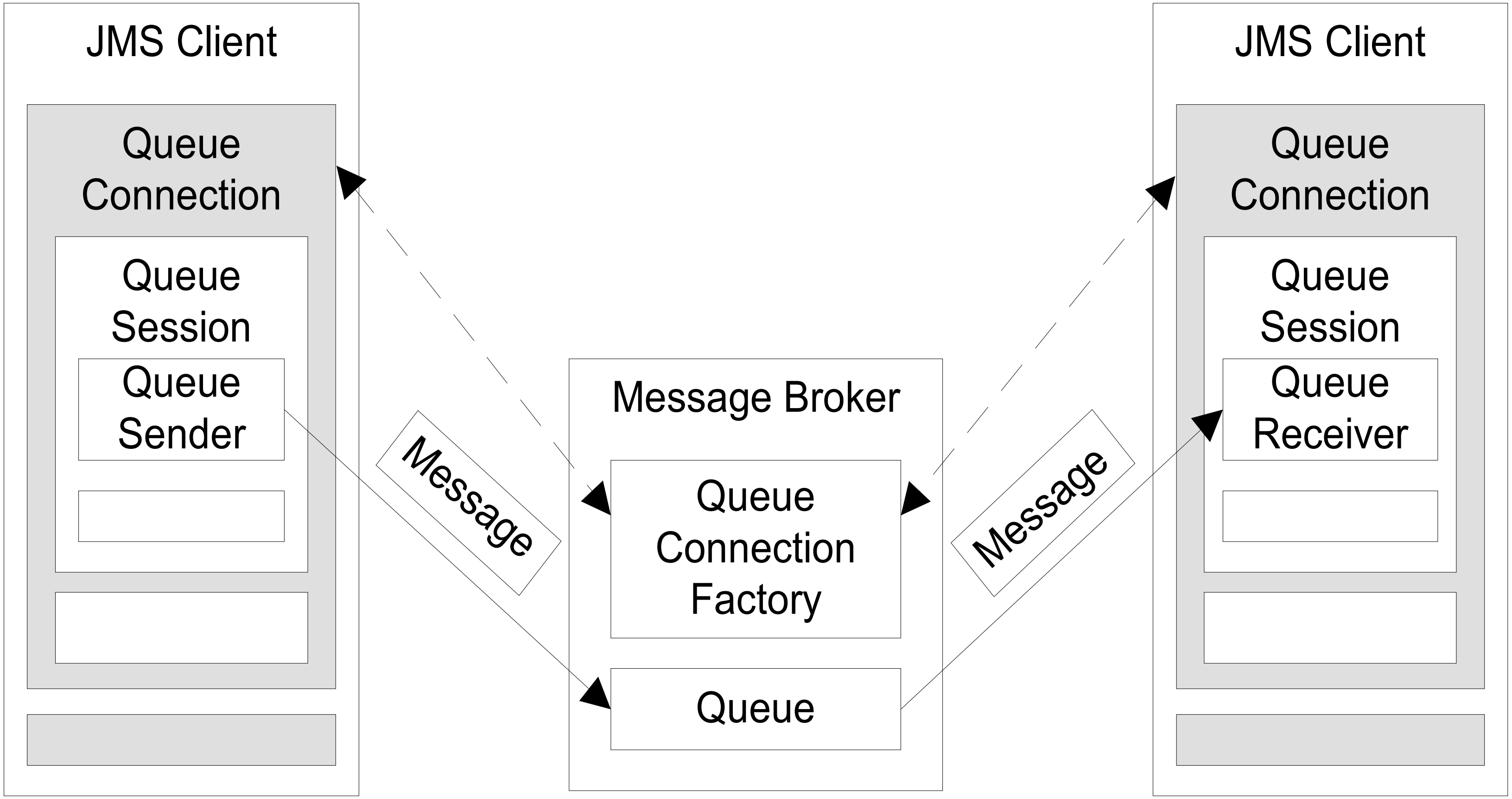
- Unit testing framework (www.junit.org)
- Automates testing and some reporting
- Most important class: `TestCase`
- failures vs. errors

Introduction JUnit: `TestCase`

Most important `TestCase` methods

- `setUp()`
- `test`*`Xxx`*`()`
- `fail()`

Quick JMS overview



Sample application

- Simple JMS client application
  - Put a text message on the queue
  - Use a utility class to encapsulate JNDI code
  - Do not forget to close the connection
  - Chain low-level exceptions (JNDI and JMS)

Sample application: code

```
public class SampleApplication {

    ...

    private void sendMessage() throws SampleApplicationException {
        try {
            QueueConnection qc = QueueUtils.getConnection();
            QueueSession qsess = qc.createQueueSession(false,Session.AUTO_ACKNOWLEDGE);

            Queue q = QueueUtils.getQueue("jms/abisQueue");
            QueueSender qsend = qsess.createSender(q);

            TextMessage msg = qsess.createTextMessage();
            msg.setText(message);
            qsend.send(msg);
            qc.close();
        } catch (CreationException e) {
            throw new SampleApplicationException("Running sendMessage()", e);
        } catch (JMSException e) {
            throw new SampleApplicationException("Running sendMessage()", e);
        }
    }
}
```

Sample application

Demo

Problems for testing

- MQ infrastructure needs to be running
- How to force exceptions from infrastructure code?
- How to check if the connection is closed?
- ...

Introduction to Mock objects

- Complements JUnit
- Replace infrastructure code with Mock objects
- Can involve refactoring of tested code!

Testing with Mock objects: step 1

- Write Mock objects
  - Start from skeleton code
  - Contain certain expectations

Testing with Mock objects: step 2

- Inject Mock objects into tested code

  2 common strategies:

  – Pass as argument to tested method

  – Use a Factory Method

First test

Demo

Test conversion of exceptions

What was done?

- Refactored code to include Factory Method
- Created skeleton implementations of JMS interfaces
- Tested code

Second test

Demo

Test close connection

What was done?

- Added expectation to Mock object
- Tested code

Third test

Demo

Test close connection when exception is thrown

What was done?

- Combined above test methods
- Tested code
- Corrected bug :-)

Making things generic

- Some code is generic
  - – Extract it into reusable classes
- Don't code yourself
  - – Include JMS, JDBC, ... Mock objects

www.mockobjects.com

Testing with mock objects

Demo

Rewriting tests using Mock objects from mockobjects.com

General test cookbook with Mock objects

- Set up Mock infrastructure (in `setup()`)
- Set up expectations
- Run code to be tested
- Verify expectations

Conclusions

Mock objects:

- Test calls to infrastructure
- Can uncover design problems
- Isolate code bugs from infrastructure bugs

Q&A

Code examples:
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http://www.abis.be

Thank you