

Distributed Systems

Exercise Sheet 6, Tuesday, 16:00

Klingemann, SS 2023

Deadline: 27th June 2023

3rd Assessed Exercise

1. ActiveMQ

1. Download the file for a binary installation of ActiveMQ (classic) for your operating system. Extract the file.
2. Start ActiveMQ. To do so, you can start a command prompt and switch to the subdirectory `bin` of your installation of ActiveMQ. In this directory you can call `activemq start`.

2. CLASSPATH

The ActiveMQ-library `activemq-all-x.x.x.jar` (the `x` describe the version number) has to be contained in the environment variable `CLASSPATH`. If you compile and execute your programs from a command prompt, you can achieve this by executing `cpa.bat` (You have to adjust the path-information so that it fits to your computer.) or you can set this variable in the Windows control panel. If you are using an IDE like Eclipse you have to configure it appropriately.

3. Example programs

Understand the example code and test the programs.

4. Realize a remote method invocation by using JMS

In this task like in Exercise Sheet 4 we want to extend the client and server so that the client can invoke methods on the server and a corresponding return value is delivered to the client. However, in contrast to Exercise Sheet 4, this time the data has to be transported using JMS. Use Publish/Subscribe for this task.

You have to extend your system for the management of wardrobes and their content from Sheet 3. Use exactly two wardrobe-objects on the server. The methods offered by the server operate on these objects. Objects of the classes `wardrobe` and `piece of clothing` must only exist on the server and not on the client. The client should be able to invoke three different methods on the wardrobe-objects. The first method is the adding of a new piece of clothing-object. The client provides the server with the values of the three attributes and gets an acknowledgement as a reply. The second method is the query for the categories of all piece of clothing-objects of the wardrobe (an additional method of the class `wardrobe`). The third method is the search for a piece of clothing with a particular category and colour. The client provides the category and colour of the piece of clothing and gets the size of the piece of clothing as a reply. The client has to offer the possibility to choose the wardrobe and call one of the three methods. Solve this task by encoding all the different pieces of information that are necessary for the method invocation within a single string. Transport this string by means of a JMS-message. Similarly, you have to transport the return-value.

5. Non-blocking Receiver

Extend your server, so that it is able to receive messages without blocking. For this purpose you should use a `MessageListener`. The server should be able to receive messages until it gets some input from the keyboard.

Organizational issues

- You have to solve the exercise completely on your own! (No working in groups!)
- It is necessary but not sufficient to present a working program. Moreover, you have to be able to explain all parts of your program, be able to answer questions with respect to your program and make small extensions of you program.
- Your program has to be created completely within the exercise slot.
- If you violate one of the rules above, this implies that you definitely fail in this exercise.
- You can only present solutions that correspond to the exercise slot you are assigned to.
- It is in your responsibility to present your solution in time before the deadline. The assessment of your solution can only be guaranteed if you finish your program 60 minutes before the end of the exercises.
- To take part in the exam it is required to solve at least three of five assessed exercise sheets.