
Communication Networks 2

Exercise 7 - Distributed Programming



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Problem 1 Motivation

What is the motivation for building distributed systems? Name four desired properties.

Problem 2 Transparencies

Which eight transparencies influence the design of a distributed system?

Problem 3 Location Transparency

Please explain the location transparency and give an application example.

Problem 4 Remote Procedure Calls

Remote Procedure Call systems are used to invoke procedures on remote hosts. To do so, some steps are necessary. Name and describe these steps. Also describe on which node these steps happen?

Problem 5 Failure Semantics

RPC usually uses UDP as transport layer protocol. As UDP is not reliable, some RPC packets might get lost. This loss causes the RPC call to fail. But there are four strategies ("failure semantics") to handle those failures. Please name and explain these semantics.

Problem 6 RMI Middleware

Please name and describe the three main components of the RMI middleware. Please also draw an image that describes how these components communicate with each other.

Problem 7 Local/Distributed Objects

Please name and describe the differences between local and distributed objects. Hint: Which operations exist in the object live cycle of local and remote objects? How do those operations differ for local and remote objects?

Problem 8 Preparing a soap client

In the HTTP exercise you wrote a parser that parsed the mensa menu and published it on the web. For this task, we created a soap based webservice that gives you the mensa card for the

current day and that is able to let you communicate about the food with the rest of the course. The webservice publishes his functionality via WSDL¹. Open that WSDL and answer the following questions:

- a) What is the namespace of the webservice?
- b) What are the implemented procedures?
- c) Which parameter takes the procedure upvote?
- d) what does fid stand for?

Problem 9 Implementing a soap client

It's now time to implement a client for the webservice. Our client will be implemented using Spyne and Python. However, all other SOAP Libraries could be used, to solve this exercise. To get an idea how such a soap webservice works and how to build a small client in python, we recommend to take a look at the helloworld description². Now its up to you, your amount and time and your motivation to implement a nice working client. Choose a programming language of your choice (python is really easy but others are also very welcome) to create a web service client.

If you created a cool terminal-, smartphone-, web- or desktop application that you want to share with the others feel free to present it at the exercise discussion, we will let the service run at least to the end of the semester.

¹ <http://test09.kom.e-technik.tu-darmstadt.de:1140/?wsdl>

² http://spyne.io/docs/2.10/manual/02_helloworld.html