Net-Computing
academic year 2008-09

Rules

- This is a closed books exam.
- The operation of any electronic device is prohibited (e.g, no calculator, phone or PDA).
- Answer the questions being *precise, complete,* and *formal.*
- Write as *clearly* as possible, both in terms of handwriting and wording.
- If possible, please write in English, otherwise Dutch.

Questions

1. Explain how a sliding window protocol is used to increase effective throughput.

2. Explain the differences between congestion-control and flow-control.

3. A Java client application wants to establish a socket connection with a Java server application located on machine 101.1.1.2 on port 80. Via this connection the server will indicate another port (e.g., port 8888) where the client can invoke another application to download a file called "secret.txt". Complete and modify the following java code to achieve this (you can ignore the code to actually download the file).

```
/* CLIENT */
    try{
        Socket s = new Socket(     );// first connection with server
        DataOutputStream os = new DataOutputStream(s.getOutputStream());
        DataInputStream in = new DataInputStream(s.getInputStream());
        BufferedReader is = new BufferedReader(new InputStreamReader(in));

        Socket s = new Socket(     );// connection with file server

    }

/* SERVER */
    try{
        ServerSocket ss = new ServerSocket(     );
        ss.setSoTimeout(100000);
        Socket s = ss.accept();
        DataOutputStream os = new DataOutputStream(s.getOutputStream());
        DataInputStream in = new DataInputStream(s.getInputStream());
        BufferedReader is = new BufferedReader(new InputStreamReader(in));

        os.writeBytes("8888\n");
    }
```

4. Suppose you own a parking garage in Groningen and you want to offer a service via the Web to allow people to know the situation of parking at a given moment in the garage and also the possibility to book a place for a given future time. What kind of Web programming model would you use? Illustrate one simple interaction of a user with the system.

5. In a car the following devices are equipped with a Java Virtual Machine, Jini and have wireless communication capabilities: the climate temperature controller, the stereo and the internal ambient lights controller. Suppose that one enters the car with a Jini equipped mobile phone whose goal is that of using the speakers of the stereo to output a telephone conversation, while turning on the internal lights if the inside temperature is below 10 degree Celsius.

   Describe the interactions of the mobile phone with the existing infrastructure in terms of Jini operations. Make the necessary assumptions on the lookup service and on the exposed interfaces by the various devices.