CPSC4780

Assignment 3

Due: March 23 (Wednesday)

The total is 25 marks.

Written questions (Due at the beginning of the class)

(1) (3 marks) You keep adding new hosts in a domain. (Assume that the domain is large enough and of course, you should stop doing this at some point.) However, doing so will not affect much the performance of the other parts of the distributed system. Explain why. (This question is related to the scalability issue of distributed systems)

(2) (4 marks) DNS is an example of name service while portmapper is another example. Consider portmapper itself as a server. List and discuss two advantages and two disadvantages of it in RPC.

(3) (3 marks) Explain the issues and concerns that we need to deal with when the server crashes in the client/server paradigm and explain why a crash at the client's site is not as severe as a crash at the server's site.

Programming question (Due at 11:59pm on March 23)

(4) (15 marks) You are required to create a RMI application. The task is described as follows.

Java provides a built-in class called *BigInteger.*
(http://java.sun.com/j2se/1.4.2/docs/api/java/math/BigInteger.html).

In this question, you are about to design and implement a BigIntCalculator server, which will perform big integer operations. Assume that the server only needs to perform Add (+), Subtraction (-), Multiplication (*), and division (/) between two big integers.

A client provides necessary arguments and calls the one of above four remote methods. After obtaining the result, the client displays it.

Some template .java files are provided on the course website. Please use them as a start.

It is required that the client stub be on the server side. Please read the tutorial on the course web page on how to set up a mini *HTTP* server.

Input and output format:

There are three parts of an operation: The first operand, the operator (+, -, *, /), and the second operand. The three parts *are separated* by spaces. The output from the client should use the format as follows:

```
Please input your operation: 123 * -100
    123
* -100
----------
-12300

Please input your operation: 123 - 100

  123
- 100
-------
    23

Please input your operation: 100-12

There should be three parts for an operation!
Please input your operation:
```

Submission:

E-mail all the related .java source code and policy files as attachments and in the *Subject* field, specify "Assignment 3, your last name". In the body of the e-mail, describe how to set up and run your RMI.