

# 1DT057 (Homework 2)

Deadline: 13 Dec 2010 (Monday) 5pm

The following *eight* questions are extracted from the textbook [Coulouris et al.].

## Chapter 1

### 1.6

Give an example of an HTTP URL.

List the main components of an HTTP URL, stating how their boundaries are denoted and illustrating each one from your example.

To what extent is an HTTP URL location transparent?

### 1.11

List the three main software components that may fail when a client process invokes a method in a server object, giving an example of a failure in each case. Suggest how the components can be made to tolerate one another's failures.

## Chapter 2

### 2.10

Give some examples of faults in hardware and software that can/cannot be tolerated by the use of redundancy in a distributed system. To what extent does the use of redundancy in the appropriate cases make a system fault-tolerant?

### 2.11

Consider a simple server that carries our client request without accessing other servers. Explain why it is generally not possible to set a limit on the time taken by such a server to respond to a client request. What would need to be done to make the server able to execute requests within a bounded time? Is this a practical option?

## Chapter 5

### 5.1

The *Election* interface provides two remote methods:

*vote*: with two parameters through which the client supplies the name of a candidate (a string) and the 'voter's number' (an integer used to ensure each user votes only once). The voter's numbers are allocated sparsely from the range of integers to make them hard to guess.

*result*: with two parameters through which the server supplies the client with the name of a candidate and the number of votes for that candidate.

Which of the parameters two procedures are *input* and which are *output* parameters?

## **5.2**

Discuss the invocation semantics that can be achieved when the request-reply protocol is implemented over a TCP/IP connection, which guarantees that data is delivered in the order sent, without loss or duplication. Take into account all of the conditions causing a connection to be broken.

## **Chapter 6.**

### **6.22**

Explain what is security policy and what are the corresponding mechanisms in the case of a multi-user operating system such as UNIX.

## **Chapter 8.**

### **8.6**

To what extent does Sun NFS deviate from one-copy file update semantics? Construct a scenario in which two user-level processes sharing a file would operate correctly in a single UNIX host but would observe inconsistencies when running in different hosts.