# ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
## ORGANISATION OF ISLAMIC COOPERATION (OIC)
## Department of Computer Science and Engineering (CSE)

**MID SEMESTER EXAMINATION** **SUMMER SEMESTER, 2017-2018**

**DURATION: 1 Hour 30 Minutes** **FULL MARKS:75**

## CSE 4803: Parallel and Distributed Processing

**Programmable calculators are not allowed. Do not write anything on the question paper.**

There are **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

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1. a) What is meant by transparency? Differentiate between migration and relocation transparency with example. 5

   b) Why it is not always a good idea to aim at implementing the highest degree of transparency possible? 5

   c) You are asked to explain the following architecture in which a service using several application/compute servers serves client requests. How can this architecture help to improve the performance of the service? 7

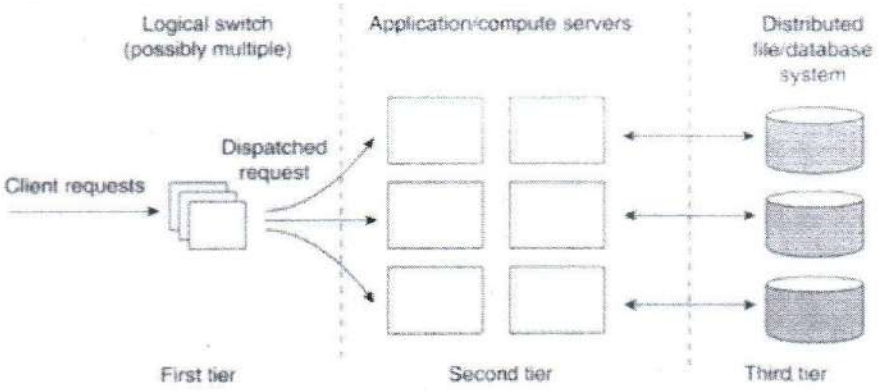


Figure 1: Distributed System Architecture

   d) What do you mean by thin client and fat client? Explain Alternative client-server organization with example. 8

2. a) Suppose you are tasked to create a distributed system for a fast food chain restaurant which provides tasty foods all over the world from various outlets. To order food from these outlets, consumers have to insert the first name and email along with the security PIN into a client's machine at every outlet. They will also have to insert the foods they want to order. Unlike most restaurants, here the users refill their accounts with monetary transactions, similar to a prepaid system and then they can order food using credits stored in their accounts. Design the system in such a way that the Authentication server and Menu Information server are different. How can you put a middleware so that each transaction is processed by single request/reply message from/to the clients' end? 7

   b) Describe the Publish/Subscribe paradigm. Use a diagram and include a description of the API used in a Publish/Subscribe system 6

   c) What is super-peer? Give an example how a super-peer can be selected and under which circumstances that would be necessary. 6

   d) Suppose you are tasked to design a Smart Home System where each electric appliance's data are monitored by a Distributed Network. Data from each appliances are stored in a centralized database for the occupants to monitor. The doctors can search by appliance's ID to find out the current status and regulate voltage. Design the system in a three level architecture and find out the benefits of such architecture in terms of performance, scalibility and maintanance. 6

3. a) Suppose you are asked to develop a distributed application using DCE/RPC. Explain how your code will be compiled and how the server stub and client stub will be linked? Use flowchart for explanation. 10

   b) What are Client and Server Stubs and how are they used in remote procedure calls? 7

   c) With an example explain the process of parameter marshaling in a remote communication through RPC. 8

4. a) Suppose in a structured peer-to-peer communication there can be at most 30 machines. If they implement Chord System to track all the machines as well as the resources, let's assume that the 10 machines online have the following IDs: 1, 4, 7, 9, 11, 14, 18, 20, 21, 28. Also assume that the length of finger table is 5. Develop finger tables for each node and describe the process for locating a resource with key 26. 8

   b) Describe the relative advantages and disadvantages of iterative and recursive name resolution in a distributed naming service. 7

   c) What is symbolic link and hard link? Explain with proper figure. 5

   d) Suppose an entity is registered in Dhaka. Suddenly it has moved to Chittagong. The network of Dhaka and Chittagong is different. How to locate this entity? Explain with figure. 5