...Sc. Engg. CSE 8th Semester (43)

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

...ID SEMESTER EXAMINATION — 15 July 2014 (Morning)

...URATION: 1 Hour 30 Minutes — SUMMER SEMESTER, 2013-2014

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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a) Define Distributed, Parallel and Concurrent computing. Briefly explain the goals of distributed systems. 3+7

b) Scalability can be achieved by applying different techniques. State the concept of these techniques. 6

c) Consider a chain of processes P_1, P_2,...., P_n implementing a multitiered client-server architecture. Process P_i is client of process P_{i+1} and P_i will return a reply to process P_{i-1} only after receiving a reply from P_{i+1}. What are the main problems with this organization when taking a look at the request-reply performance at process P_1? 5

d) What is the role of middleware in distributed system? 4

a) What do you mean by transparency? Explain different types of transparency in distributed system. 2+5

b) Explain the meaning of virtual organization. How can such an organization be implemented? 2+5

c) Define Grid Computing. Figure 1 depicts a layered architecture for grid computing systems. Explain how this architecture works. 2+5

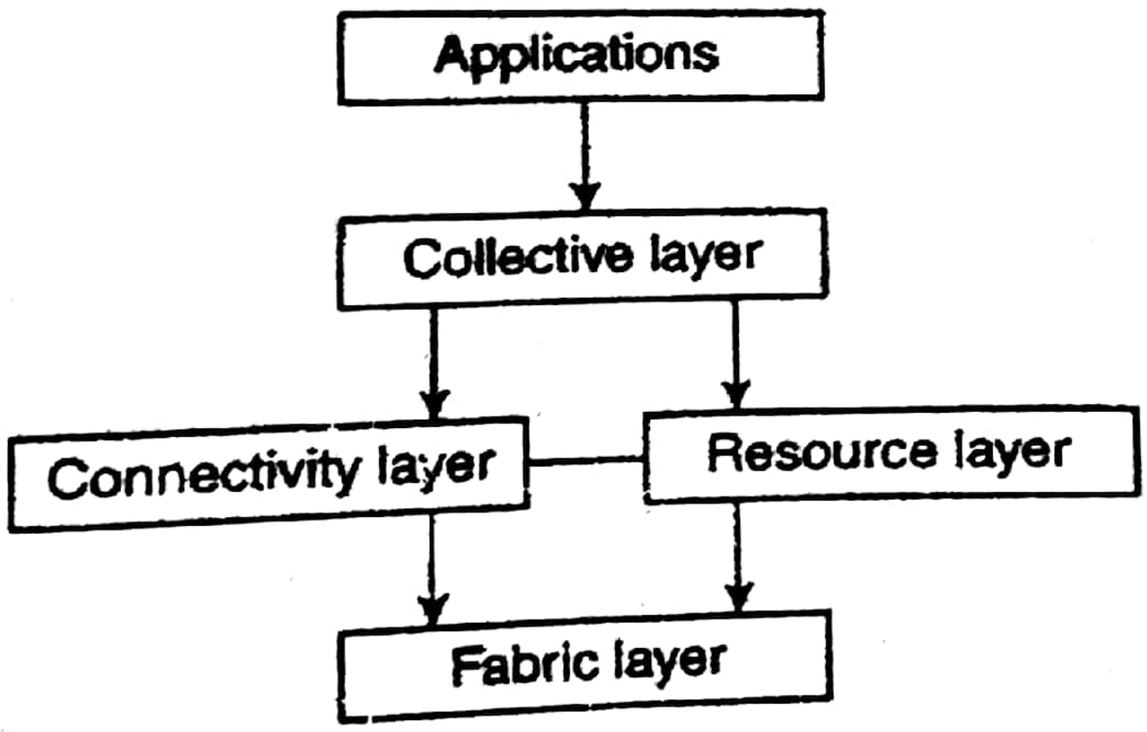

Figure 1: Grid computing system for question 2.(c)

d) Define distributed information systems. Briefly explain the ACID properties of a typical transaction processing system. 1+3

a) What is virtualization? Explain the role of virtualization in distributed system. 2+5

b) Consider a hypothetical car hire company and sketch out a three-tier solution to the provision of their underlying distributed car hire service. Use this to illustrate the benefits and drawbacks of a three-tier solution considering issues such as performance, scalability, dealing with failure and also maintaining the software over time. 5

c) Figure 2 demonstrates the alternative client-server organization of multi-tiered architecture for distributed systems. Explain its different types with appropriate examples. 8

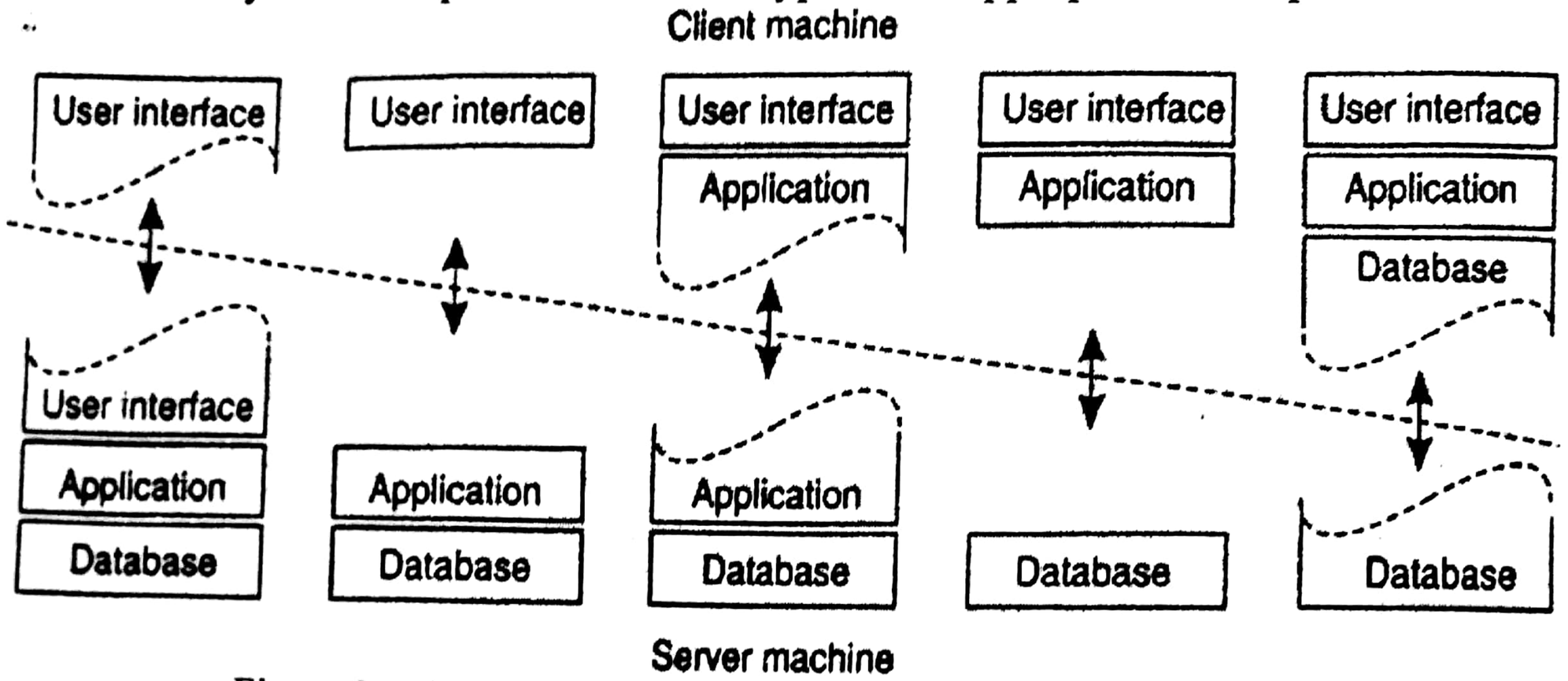

Figure 2: Alternative client-server organization for question 3.(b).

d) Compare and contrast different types of architectural styles in a distributed system. 5

4 a) What do you understand by host based and network based mobility in a distributed system? Explain the operation of Proxy Mobile IPv6. 2+5

b) Consider a BitTorrent system in which each node has an outgoing link with bandwidth capacity B_{out} and an incoming link with bandwidth capacity B_{in}. Some of these nodes (called seeds) voluntarily offer files to be downloaded by others. What is maximum download capacity of a BitTorrent client if we assume that it can contact at most one seed at a time? 5

c) Explain the operation of current Internet architecture. Why do researchers look for ID/locator separation architecture? Discuss with necessary figures. 5+5

d) What do you mean by Superpeers? Explain the concepts of topology management of overlay networks. 1+2