

C12-R3: DISTRIBUTED SYSTEMS

NOTE:

1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.
 - a) Compare and contrast different service classes for the ATM Adaption layer.
 - b) What are the essential differences between remote objects and local objects in Java?
 - c) For supporting heterogeneous computers and networks offering a single system view, how are distributed system organized? How can you consider a network of workstation in a university system as an example of distributed system?
 - d) What are the design and implementation issues of Distributed Shared Memory?
 - e) High-level name servers in DNS, that is, name servers implementing nodes in the DNS name space that are close to the root, generally do not support recursive name resolution. Can we expect much performance improvement if they did?
 - f) In order to specify the resource requirements software components that process multimedia data, we need estimates of their processing loads. How can this information be obtained without undue effort?
 - g) Which properties of Hash functions make them suitable for cryptographic systems? Also differentiate between weak collision resistance and strong collision resistance properties.
(7x4)

2.
 - a) What are the different aspects of transparency supported by the distributed system? Name and explain each in brief.
 - b) What do you mean by Scalability of a distributed system? Write down the guiding principles for designing scalable distributed systems.
(9+9)

3.
 - a) What are the problems encountered in connecting distributed systems using wireless LAN?
 - b) Mention three different methods that may be used in ATM Networks to allocate bandwidth to applications to make best use of the available bandwidth while satisfying the requests of the application. Also give the relative advantages and limitations of the above mentioned methods.
(8+10)

4.
 - a) Explain how the two-phase commit protocol for nested transactions ensures that if the top-level transaction commits, all the right descendants are committed or aborted.
 - b) Give an example of interleavings of two transactions that is serially equivalent at each server but is not serially equivalent globally.
(10+8)

5.
 - a) Is it conceivably useful for a port to have several receivers?
 - b) A server creates a port which it uses to receive requests from clients. Discuss the design issues concerning the relationship between the name of this port and the names used by clients.
 - c) Why is there no explicit data typing in CORBA CDR?
(8+6+4)

6.

- a) Write down some of the common goals of computer security. Differentiate between passive attacks the active attack.
- b) Compare between symmetric and asymmetric cryptosystems. Why asymmetric cryptosystem is also referred to as public key system.
- c) How can you handle deadlocks in distributed systems? Give the working principle of distributed deadlock detection algorithm proposed by Chandy-Mishra-Hass algorithm.

(6+6+6)

7.

- a) What do you mean by process migration? Write down the steps of process migration.
- b) What are the desirable features of a good process migration mechanism?
- c) What is a thread?
"It is better to use multithreaded process instead of multiple single threaded processes for performing some computation activities." Explain

(6+4+8)