Question Paper

Exam Date & Time: 05-Jul-2023 (02:30 PM - 05:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.TECH MAKEUP EXAMINATIONS, JLUY 2023

DISTRIBUTED SYSTEMS [ICT 3254]

Α

Marks: 50

Duration: 180 mins.

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1)	۸)	The host computers used in peer-to-peer systems are often simply desktop computers in users' offices or homes. What are the implications of this for the availability and security of any shared data objects that they hold and to what extent can any weaknesses be overcome through the use of	(5)
	A)	replication?	
	B)	Suppose we want to access a web page; we initiate the process by requesting through browser. Illustrate the referring protocol aids in sending such HTTP requests.	(3)
	C)	Many networked systems are organized in terms of a back office and a front office. How does organizations match with the coherent view we demand for a distributed system?	(2)
2)		Remote Method Invocation (RMI) architecture involves implementation of application layer, proxy layer and remote reference layer. Discuss the implementation of all the layers in detail.	(5)
	A)		
	B)	Justify the statements.	(3)
		i. PUT and DELETE methods are defined to be idempotent.	
		ii. The operation to append data to a file is not idempotent	
	C)	Answer the following w.r.t flat file and directory service:	(2)
		(i) Why there is no open or close operation in the interface to the flat file service or the directory service?	
		(ii) Differentiate between directory service Lookup operation and the UNIX open?	
3)		With a suitable diagram, explain the execution of the bully algorithm that elects the coordinator for mutual exclusion. Compare this algorithm with other algorithms based on complexity and	(5)
	A)	disadvantages. What are the responsibilities of the elected coordinator in handling processes.	
	B)	Explain the need of mutual exclusion in distributed system. How modified Ricart-Agrawala algorithm is useful to handle mutual exclusion in any distributed system.	(3)
	C)	Discuss the importance of UFIDs in file systems? How is uniqueness for UFIDs ensured?	(2)
4)	۵)	How to ensure the serial equivalence of any two transactions using two-phase locking protocol. In which circumstances, strict two-phase locking protocol required. How this protocol supports to prevent lost update and inconsistent retrieval problems.	(5)
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Draw event diagram for each Lamport timestamp event using vector timestamps as shown in figure (3) Q4B. Use vector ordering and identify which event(s) is/are concurrent with event e.



Figure Q4B

- C) How might the clocks in two computers that are linked by a local network be synchronized without (2) reference to an external time source? What factors limit the accuracy of the procedure you have described? How could the clocks in a large number of computers connected to the Internet be synchronized? Discuss the accuracy of that procedure.
- 5)Give two examples of software and hardware faults which cannot be tolerated in real time(5)distributed systems. How these faults can be managed using commonly implemented techniques of
redundancy and process resilience? Explain these techniques using suitable diagrams.
 - B) What are the various semantics applicable in distributed nested transactions? How two-phase (3) commit protocol works in managing transactions which are executing on different servers.
 - C) How table abstraction can be achieved in google to manage the storage and retrieval? (2)

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