SPRING END SEMESTER EXAMINATION-2019

6th Semester B.Tech

DISTRIBUTED OPERATING SYSTEMS

CS-3024

(For 2017(L.E) & 2016 Admitted Batches)

Time: 3 Hours Full Marks: 60

Answer any SIX questions.

Question paper consists of four sections-A, B, C, D.

Section A is compulsory.

Attempt minimum one question each from Sections B, C, D.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

SECTION-A

1. [2× 10]

(a) Consider a distributed environment with four systems, A,B,C and D. Name the type of transparencies required in each of the following situations:

i. Data available at all four systems and user want to modify the data at D.

ii. Printer connected to A is disconnected and connected to B. User wants to access that printer.

iii. Breakdown of system, D.

iv. User want to access the software X without knowing its whereabouts.

(b) Contrast between Network OS and Distributed OS.

(c) Explain causally related events.

(d) Analyze implementation rules of Lamport's logical clock and vector clock.

(e) Why global clock is important in a distributed system? Why this is an issue?

(f) Distinguish between failure and fault.

(g) If communication channel is NON - FIFO, does

i. Lamport's DME algorithm ensures mutual exclusion condition?

ii. Ricart - Agrawala's permission based DME algorithm ensures mutual exclusion condition?

(h) What do you mean by false deadlocks in distributed environment? How this can be detected?

(i) What are different resource request models?

(j) Discuss different features of RPC model.

SECTION-B

2. (a) What are design issues one must focus while designing a good distributed system. Explain those with examples. [4]

(b) What are different transparencies which can be observed in distributed system? List basic transparencies need to be supported by the distributed system. [4]

3. (a) Give the consistent global state requirements in DCS. When the global state is said to be strongly consistent? [4]

(b) What are the various models used for building the distributed systems. Explain those with neat figures. [4]

SECTION-C

4. (a) Why is the Ricart-Agarwal Algorithm used.Explain the algorithm steps considering an example. [4]

   (b) Compare the performance measures between following algorithm: [4]

   i. Lamport's DME algorithm

   ii. Ricart Agrawala's permission and token based DME algorithm

   iii. Meakawa's DME algorithm

   iv. Raymond's tree based DME algorithm

5. (a) Analyse different distributed approaches of deadlock detection in DCS. Justify which one is suitable for distributed system. [4]

   (b) What is Stub? How are they generated? State their functionality and purpose? [4]

6. (a) What is the need of coordinator selection algorithm? Explain election based coordinator selection algorithm for distributed system. [4]

   (b) Explain how the commit protocol and voting protocol can be used to design fault tolerant system. [4]

SECTION-D

7. (a) Discuss all mechanism for building distributed file system. [4]

   (b) Explain two-phase commit protocol associated with distributed system. [4]

8. Write Short notes

(a) Path-Pushing Algorithm [4]

(b) Meakawa's DME algorithm [4]

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