APRIL

22 Tuesday

112-253 · WK17

8.8.2020

CSE 431 DISTRIBUTED SYSTEMS

TAUGHT BY

- prof. Kishore Kothapalli

COURSE TOPICS

1. foundations
   - characterizations of distributed systems
   - system models
   - networking & inter-networking
   - inter-process communication
2. logical time
   - a framework for a system of logical clocks.
   - scalar time
   - vector time
   - efficient implementation of vector clocks
   - synchronization of physical clocks. NTP.

2014

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Wednesday 23

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3. global state & snapshot recording algorithms
   - system model & definition
   - snapshot algorithms for FIFO channels
   - middleware
   - distributed objects and RMI

4. termination detection
   - termination detection using distributed snapshots.
   - a spanning-tree based termination detection algorithm.

5. distributed mutual exclusion algorithms:
   - lamport's algorithm
   - ricart-agarwala's algorithm.
   - sughal's dynamic information
   - Structure algorithm
   - quorum-based mutual exclusion algorithm.

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24 Thursday

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- maekawa's algorithm

6. deadlock detection in distributed systems

- mitchell and merrit's algorithm for single resource model

7. consensus & agreement algorithm

- problem definition
- agreement in a failure-free system (synchronous or asynchronous)
- agreement in (message passing) synchronous system with failures.
- agreement in asynchronous message passing systems with failures.

+ RPC, google protobufs
+ logical clocks, vector clocks, generalized clocks
+ totally ordered multicase
+ mutual exclusion, leader election algorithms

2014

COOLER EC CONTROL?

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Friday 25

WK 17 • 115-250

MAY 2014

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+ deadlock detection / prevention algorithms

+ consensus algorithm, paxos (possibly raft)

+ consistency, eventual consistency, monotonic reads, read your writes, etc.

+ failure modes, types of failures

+ distributed transactions, 2 phase commit, 3 phase commit

+ CAP theorem

+ apache HDFS, MapReduce

+ google BigTable

+ amazon dynamo DB

+ kafka

TEXTBOOKS

1. distributed computing principles, algorithms, and systems. (2008)

2. distributed systems - an algorithmic approach. (2007)

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26 Saturday
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MARCH 2014

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3. distributed computing principles and applications. (2004)

4. distributed systems - concepts and design. (2011)

5. advanced concepts in operating systems. (1994)

27 Sunday

2014