IF 3230 Sistem Paralel dan Terdistribusi

Review

Topik

- konsep dasar
- model dan abstraksi
- arsitektur sistem
- komunikasi
- Naming
- Distributed File Systems
- Clock dan Sinkronisasi
- Konsensus – Raft & Paxos
- Distributed Mutex

Konsep

- Konsep sistem terdistribusi:
  - koordinasi antar proses/node yang tidak memiliki shared memory dan clock bersama
  - goal: meningkatkan skalabilitas, kinerja, ketersediaan/availability (fault tolerance)
  - problem: kegagalan parsial/sebagian

Model dan Abstraksi

- Model node dan link komunikasi
  - model kegagalan: crash, byzantine, crash recover, omission, out of order
  - model persistensi: volatile dan persisten
- model timing: sinkron vs asinkron
- teorema CAP

Arsitektur

- Layer
- object based
- publish/subscribe
- shared data space
- client-server
- n-tier
- peer to peer

Komunikasi

- message oriented
- RPC
- stream

Naming

- Naming service
- Naming/penemuan resource pada large node
  - Centralized
  - DHT
    - CAN, Chord

Distributed File Systems

- NFS
- AFS
- GFS

Clock Synchronization

- physical clock

- logical clock

- vector clock

Fault tolerant & Consensus

- konsep fault tolerance: fail, error, fault
- jenis fault
- failure detector
- failure masking => replication
- konsensus
  - paxos
  - raft

Distributed Mutual Exclusion & Leader Election

- Distributed Mutex
  - Centralized
  - Token/ring based
  - contention based
    - lamport, ricart & agrawala
- Leader Election
  - bully, ring, Chang & Robert ring