CS 499 – Distributed Systems  
Wednesday, October 28, 2009

TODO:

Class Notes:

Lecture Notes:

* Mutual Exclusion is a big thing.
* From OS, what made this difficult
  + How do you synchronize operations?
    - not having a Machine Instruction for locking and setting
* Elections
  + To designate a process for a task
  + // When a process fails
    - the others has an agreement about how to deal with it
  + Choose Process with highest ID
    - // Assume we want to use Algorithms to find the greatest Identifier
      * so we can simplify the action of choosing
    - E1 (safety):
      * A participating process has “elected” set to undetermined or a process P, where P is the non-crashed process with biggest ID
      * // finding a valid process
      * // safety is the most important thing
    - E1 (liveness):
      * All processes participate and set elected to valid ID or crash
      * // make sure all processes participate
* Algorithms:
  + No Central Server algorithm
    - // (?) we assume this is the default
  + Ring-Based Algorithm
    - * system can be asynchronous
      * Processes don’t crash
    - Participants/non-participants
    - Distinguish between: Election/Elected messages
    - If an a process wants to \_\_\_\_\_\_\_\_\_\_\_ it sends a election message to its successor with ID value.
      * What happens when a process gets an election message
      * Flow Chart:

ID greater than my own

Forward

Am I Participating?

Put own ID in

Do nothing

Set status to participant

Send out elected message

* + Bully Algorithm
    - //make Assumptions
    - A-priori knowledge of all the process IDs
      * // (A-priori is the best assumption)
      * The system is synchronous
        + this is a requirement
    - Properties (?)
      * Election message, Answer Message, Coordinator Messages
      * Processes can crash
    - Algorithm:
      * Process with highest ID can send out coordinator message.
        + // Highest ID becomes the Coordinator
      * Process can send out election message
        + // any process
        + but can only send to higher ID processes
        + Waits for Answer Message

If none ( in T ) 🡪 send coordinator message

If there is answer 🡪 waits for coordinator

if you don’t get coordinator message, start new election

* + - * + If you get an election message 🡪 start an election