CSCI 251: Concepts of Parallel and Distributed Systems

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Coordination and Agreement

Topics:

- Mutual Exclusion
- Election
- Multicast

Mutual Exclusion

Requirements:

- Safety: at any time, only one process has access to a critical section
- Livencess: a process making a request for access to a critical section, will eventually get access
- HB order (happened before order): entry to a critical section is in "happened before" order. A process P_i that makes a request before process P_j should get access before process P_j

Performance:

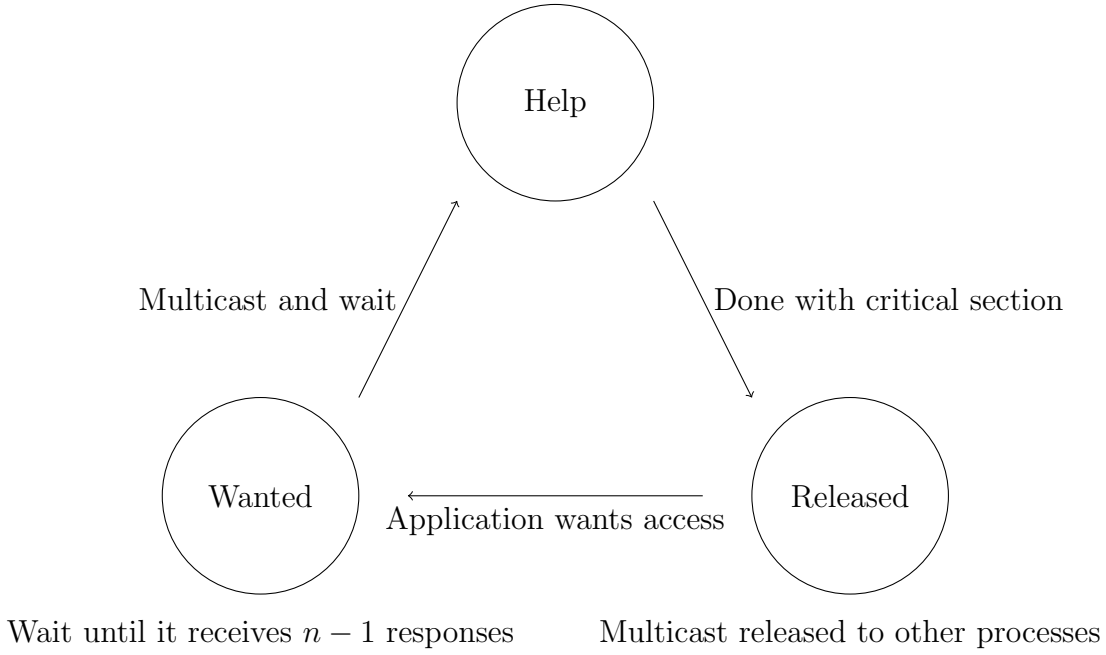
- Bandwidth Consumption: number of messages sent on communication channels
- Client Delay: Amount of time a process waits after making a request
- Throughput: Number of requests granted per unit time

Client Server Mechanisms

A server that receives requests from processes grants access to them one at a time. The server maintains a queue to give access (first in first out).

Multicast

A process can be in one of three states:



Election Algorithm

In distributed systems, it is necessary to select a leader among a set of processes to assign tasks to processes, to make decisions, and decide on variables. Any process in the system can decide whether a leader needs to be elected. This can happen by agreement when process p_i initiates the election process designating p_j as the leader and sends a multicast to all other processes. Other processes can agree or disagree, in which case the processes suggests another leader process and multicasts.

Reminders

Check MyCourses for details on Project 2.
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You can find all my notes at `http://omgimanerd.tech/notes`. If you have any questions, comments, or concerns, please contact me at alvin@omgimanerd.tech