CS 250 Long Examination

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1. WANET or MANET election algorithms cannot be used in the selection of superpeers. Since participation is based on network connectivity and since message passing is not that reliable then the superpeer cannot fulfill its duties since its dependent regular peers may not maintain a sustainable connection with each other even locally what more if superpeers connect to other superpeers without a sustainable connection.
2. I would use the bully algorithm because it is simple in nature since being in the communications industry, I develop coordinators and processors that depend on these. I honestly only used Bully algorithms without even knowing it was called that. I think it is the easiest to understand if it is implied. In my experience, the highest memory shared would have higher priorities to be the electoral winner. However, we encountered a bug at some point when the fiber optic system elected on the lowest-capacity thread was elected as coordinator but it was 6 months after we deployed so counting that time, it was also highly maintainable.
3. A logical clock is used for distributed systems, and a physical clock is used for a component of a distributed system. However physical clocks may be close to the actual time and be used in a distributed system but it would cost a price to synchronize these clocks since it uses pricey materials. In a logical clock, global and local usage is key to synchronize the system. Several algorithms and counters further prove logical clocks efficiency and practicality.
4. Load sharing is when a more capable link shares the traffic from the slower link. Load balancing is when traffic is evenly spread across all open links regardless of capability. It is appropriate to use load balancing in the telecommunication industry because people paying for a higher price of bandwidth must enjoy faster internet ☺.
5. Process termination. This argument is the same as in why all-or-nothing is the standard for databases in the present. In a perfect world, for example the bridge-car deadlock example which is widely apparent in the Philippines, it would be better if everyone backed off and reassessed their positions and right of ways and solved it like honestly good countrymen. It is unfair if one of the cars would back off and it is the car that has the right of way. There are just too many questions to be answered if we use resource preemption, like how high is high priority or how much resource is enough.
6. Path-pushing and Edge-chasing algorithm do not differ when it comes to purpose. Basically, DFS and BFS. Edge-chasing however, I feel is better with the fact that it just travels around the network just like how a packet should.
7. Client-initiated asks for resources whenever it is heavily loaded. Receiver-initiated asks for resources at a scheduled time. Client-initiated distributed heuristic algorithm’s advantage is that it is a situational distribution. Receiver-initiated distributed heuristic algorithm’s advantage is that it puts lesser stress on the heavy client. The disadvantage of client-initiated is that even though it is under heavy load it will still probe for more work. The receiver-initiated disadvantage is that it does not know what processes are in heavy load.
8. If we treat the system like a restaurant with only one cashier and the cash register broke down in the middle of printing of a receipt, then we can achieve the four necessary conditions. By way of having a mutual exclusion when it comes to unshareable resource, partial allocation with the receipt, no preemption with the customer payment in the cash register, and circular wait to make things first come and first serve.
9. Clock drift is when a clock does not run at the exact same speed as another due to physical or logical timing. Clock skew is when the signal reaches different components on the same circuit at different times. Lamport algorithm still would work however, the clock that should implement this must be at the server so that it can still provide good schedule.
10. I would go for prevention since avoiding all possible deadlocks is harder than preventing them from ever happening. It’s like killing the disease when symptoms show instead of taking medicine beforehand without knowing if it’s going to happen or not. It’s a waste of resources.