

HW #3. FIFO Broadcast

(Due: 5/20/2016)

In this homework, you need to implement the reliable broadcast protocol and then the FIFO broadcast protocol that we introduced in the class. Assume there will be network partition, we have:

■ **Reliable broadcast** guarantees the following properties:

- **Validity:** if a correct process broadcasts a message m , then all correct processes eventually deliver m (all messages broadcast by correct processes are delivered)
- **Agreement:** if a correct process delivers a message m , then all correct processes eventually deliver m (all correct processes agree on the set of messages they deliver),
- **Integrity:** for any message m , every correct process delivers m at most once and only if m was previously broadcast by a sender (no spurious messages are ever delivered)

■ **FIFO Broadcast**, which is a Reliable Broadcast that satisfies the FIFO order requirement on message delivery

- **FIFO order:** if a process broadcasts a message m before it broadcasts a message m' , then no correct process delivers m' , unless it has previously delivered m (messages send by the same sender are delivered in the order they were broadcast)

In addition to the source code of your implementation, you also need to write a report the following items

- A. Design an experiment to validate your implementation of reliable broadcast
- B. Design an experiment to validate your implementation of FIFO broadcast
- C. Design an experiment to compare the performance of the reliable broadcast implementation vs. the FIFO broadcast implementation
- D. Include the experiment results and your analysis of the results in the report