Discrete Event Simulation

Discrete event simulation is the simulating based on distinct events. Those events and only those events are what affect the state of the simulation. Other properties such as time and stacks only exist as a byproduct of the events occurring.

Description of Phase 1

In Phase 1, we simulated a single server as it receives and distributes response packets. Packets are received and handled in a negative exponentially distributed time (a decent approximation of real networks). Our simulated server therefore had to deal with any number of incoming packets and occasionally had to drop the packets due to insufficient incoming buffer size.

Logic of Phase 1

Our phase 1 simulation ran until an arbitrary time was passed. Each cycle handled 1 event advancing time to the time of the next events occurrence. The next event would always be either an incoming event or a departure event (if the buffer was not empty). On incoming event we would check if we had room in our buffer and if so add a departure event to our buffer. Then decide when the next incoming event would occur. If a departure was the next event we would pop an event off the departure queue and decide when the next departure event is to occur. We would repeat this process with different lambda and buffer sizes for all conditions in the simulation.