Project for Parallel Simulation, CS 766

The project concerns a parallel simulation of a mobile communications network. Known as a PCS (personal communications system), it provides communications for mobile users. The service area is divided into cells, each of which has a transmitter with a fixed number of channels. A regular hexagon is used to represent a cell. When a user makes a call, a channel is assigned to the user. If all channels are allocated, the call is blocked. If a user moves from one cell to another during a call, a new channel is allocated to provide for a continuation of the call.

In the simulation, LPs correspond to cells, and each cell has 500 channels. Calls can be static or mobile. The velocity of a mobile call is assumed to be constant, and its direction can be chosen from one of six directions-north, east, south, west, southwest, northwest, northeast. The velocity and direction of a call are chosen from a uniform distribution and the call completion time is determined by an exponential distribution with a mean of 300. The cell diameter is fixed at 1 km.

You should use a hexagonal mesh topology, as suggested by Lin and Mak (Eliminating the Boundary Effect of a Large-Scale Personal Communication Service Network Simulation, ACM Transactions on Modelling and Computer Simulation, 4(2):165-190, 1994.

Finally, you should use null messages to synchronize the simulation.

The project is due on the last day of class. It is expected to be an individual project.