Skype Cloud Technology Test Task

Objective: Develop a simulator for simplified presence updates

The task consists of two parts:
- An implementation of a node that communicates its presence to its buddies (representing the Skype client in the real world)
- A simulator/driver for the nodes (representing the users using Skype and the network environment in the real world)

Presence in the context of this task is the state of the node and can be either ONLINE or OFFLINE. The simulator will change each node's presence using the following algorithm:
1. The initial state of a node is chosen randomly
2. The node sleeps (i.e. doesn't change state) for a random number (between 0 and 4000) of seconds
3. The node's state is changed
4. Continue with step 2

Each node has a number of buddies and has to maintain the presence state of these buddies. The simulator sets up a configurable number of nodes (e.g. 1000) and a configurable number of buddies for each node. Buddies are chosen randomly. The nodes can exchange information about their state by sending messages to each other through the simulator. The simulator simulates packet loss by not forwarding a percentage (e.g. 5%) of messages. A node cannot send more than 5 messages per minute.

The transition from ONLINE to OFFLINE is to be considered as a network failure, i.e. the node cannot communicate with other nodes until it is ONLINE again.

The simulator and the nodes have to work in simulated time, i.e. they have to constantly use 100% CPU resources. The simulator works for a configurable number of seconds of simulated time and outputs the following:
- average time elapsed between the change of node's presence and when it's buddies get to know about the change
- number of messages sent per minute

The simulator can be implemented in any language. The nodes and the simulator should all run together in a single OS process.