Analysis/Discussion

- Well-known result: a gossip takes $O(\log(N))$ time to propagate.
- So: Given sufficient bandwidth, a single heartbeat takes $O(\log(N))$ time to propagate.
- So: N heartbeats take:
  - $O(\log(N))$ time to propagate, if bandwidth allowed per node is allowed to be $O(N)$
  - $O(N.\log(N))$ time to propagate, if bandwidth allowed per node is only $O(1)$
  - What about $O(k)$ bandwidth?
- What happens if gossip period T_{gossip} is decreased?
- What happens to $P_{mistake}$ (false positive rate) as T_{fail}, $T_{cleanup}$ is increased?
- Tradeoff: False positive rate vs. detection time vs. bandwidth