CLOUD COMPUTING CONCEPTS

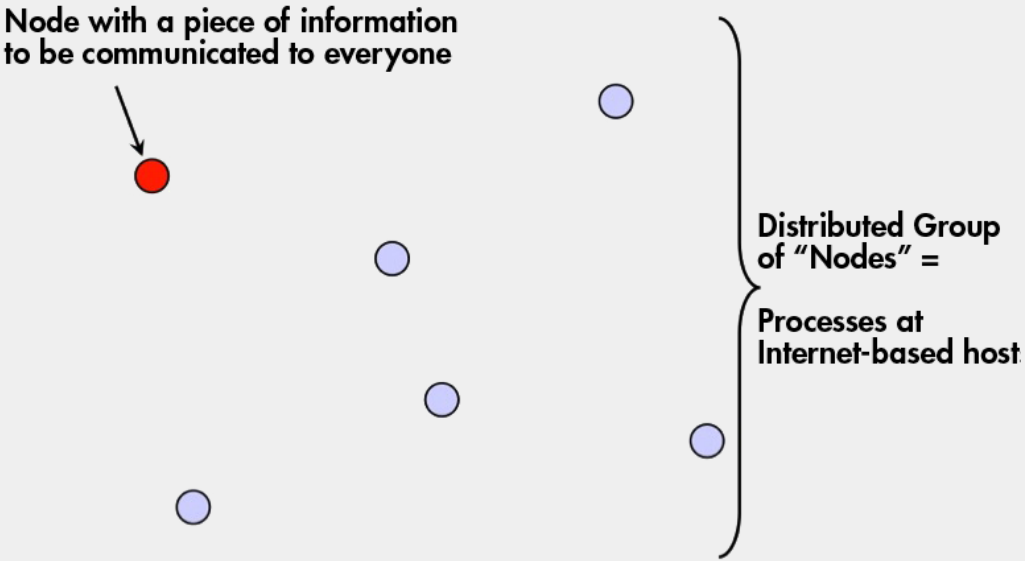
with Indranil Gupta (Indy)

GOSSIP

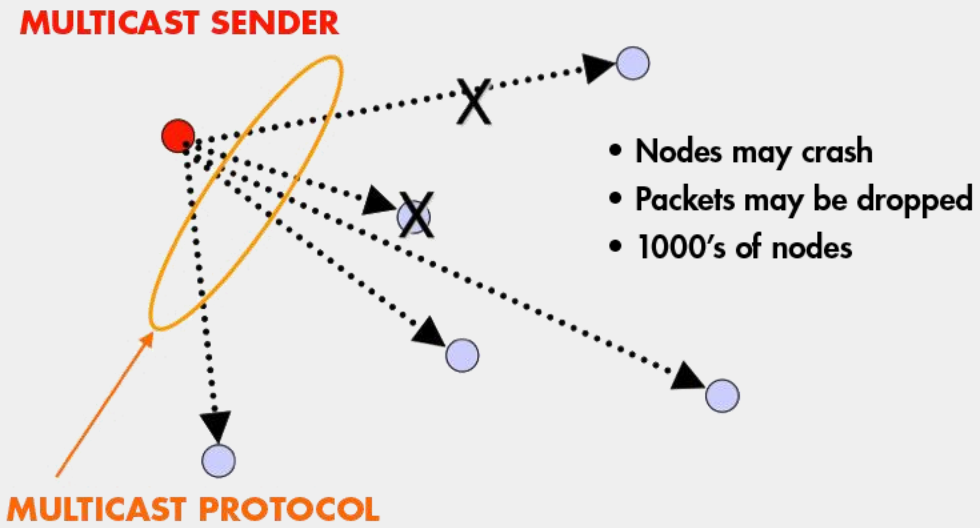
Lecture A

MULTICAST PROBLEM

Multicast

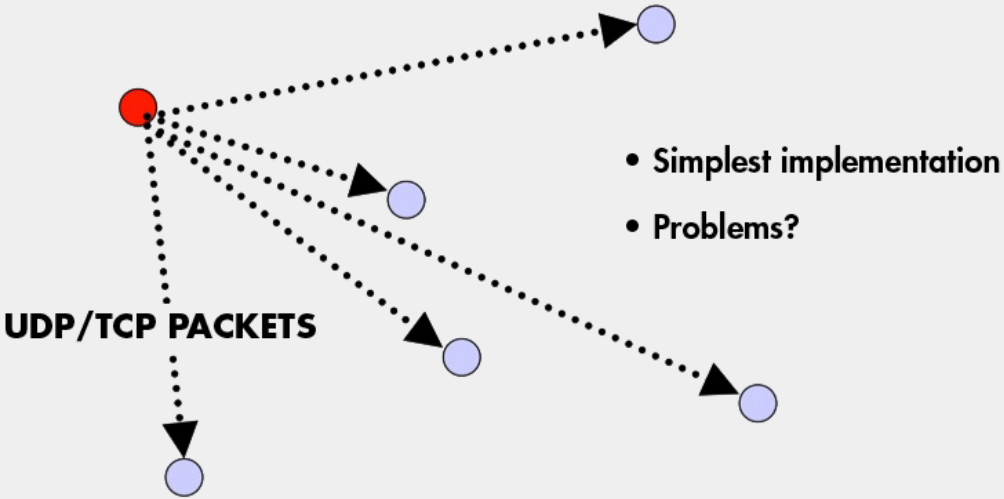

Node with a piece of information
to be communicated to everyone
Distributed Group
of "Nodes" =
Processes at
Internet-based host

Fault-tolerance and Scalability



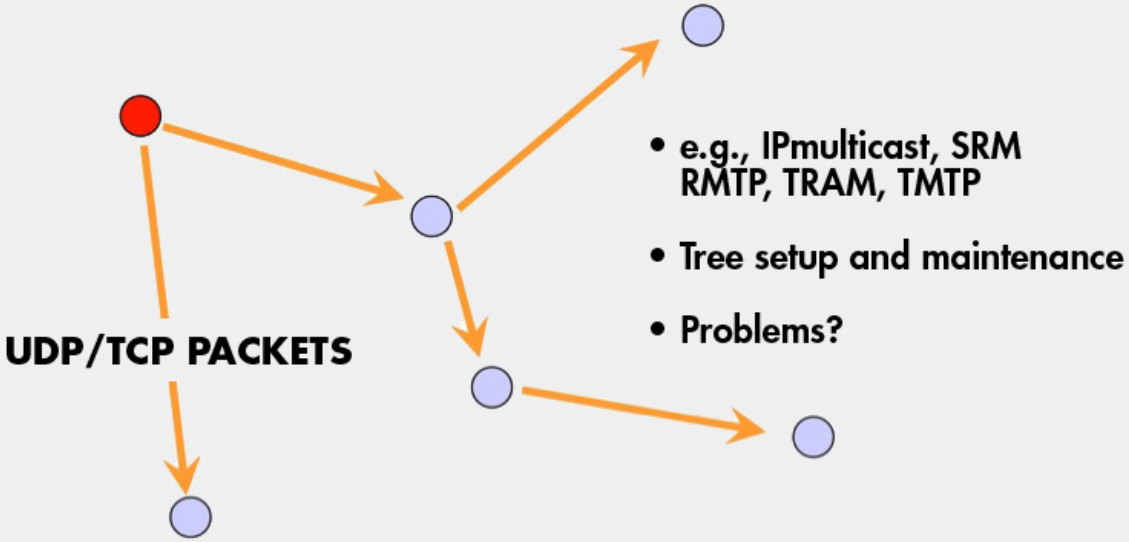
- Nodes may crash
- Packets may be dropped
- 1000's of nodes

Centralized



- Simplest implementation
- Problems?

Tree-Based



- e.g., IPmulticast, SRM RMTP, TRAM, TMTP
- Tree setup and maintenance
- Problems?

Tree-based Multicast Protocols

- Build a spanning tree among the processes of the multicast group
- Use spanning tree to disseminate multicasts
- Use either acknowledgments (ACKs) or negative acknowledgements (NAKs) to repair multicasts not received
- SRM (Scalable Reliable Multicast)
  - Uses NAKs
  - But adds random delays, and uses exponential backoff to avoid NAK storms
- RMTP (Reliable Multicast Transport Protocol)
  - Uses ACKs
  - But ACKs only sent to designated receivers, which then re-transmit missing multicasts
- These protocols still cause an O(N) ACK/NAK overhead