

Need to deal with dynamic changes

- ✓ Peers fail
 - New peers join
 - Peers leave
 - P2P systems have a high rate of *churn* (node join, leave and failure)
 - 25% per hour in Overnet (eDonkey)
 - 100% per hour in Gnutella
 - Lower in managed clusters
 - Common feature in all distributed systems, including wide-area (e.g., PlanetLab), clusters (e.g., Emulab), clouds (e.g., AWS), etc.

So, all the time, need to:

→ Need to update *successors* and *fingers*, and copy keys