RAMAIAH
Institute of Technology

M.S. Ramaiah Institute of Technology
(Autonomous Institute, Affiliated to VTU)
Department of Computer Science and Engineering

Course Name: Distributed Systems
Course Code: CSE20/CSE751
Credits: 3:0:0

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Faculty:
Sini Anna Alex

DHT=Distributed Hash Table

- A hash table allows you to insert, lookup and delete objects with keys
- A *distributed* hash table allows you to do the same in a distributed setting (objects=files)
- Performance Concerns:
  - Load balancing
  - Fault-tolerance
  - Efficiency of lookups and inserts
  - Locality
- Napster, Gnutella, FastTrack are all DHTs (sort of)
- So is Chord, a structured peer to peer system that we study next

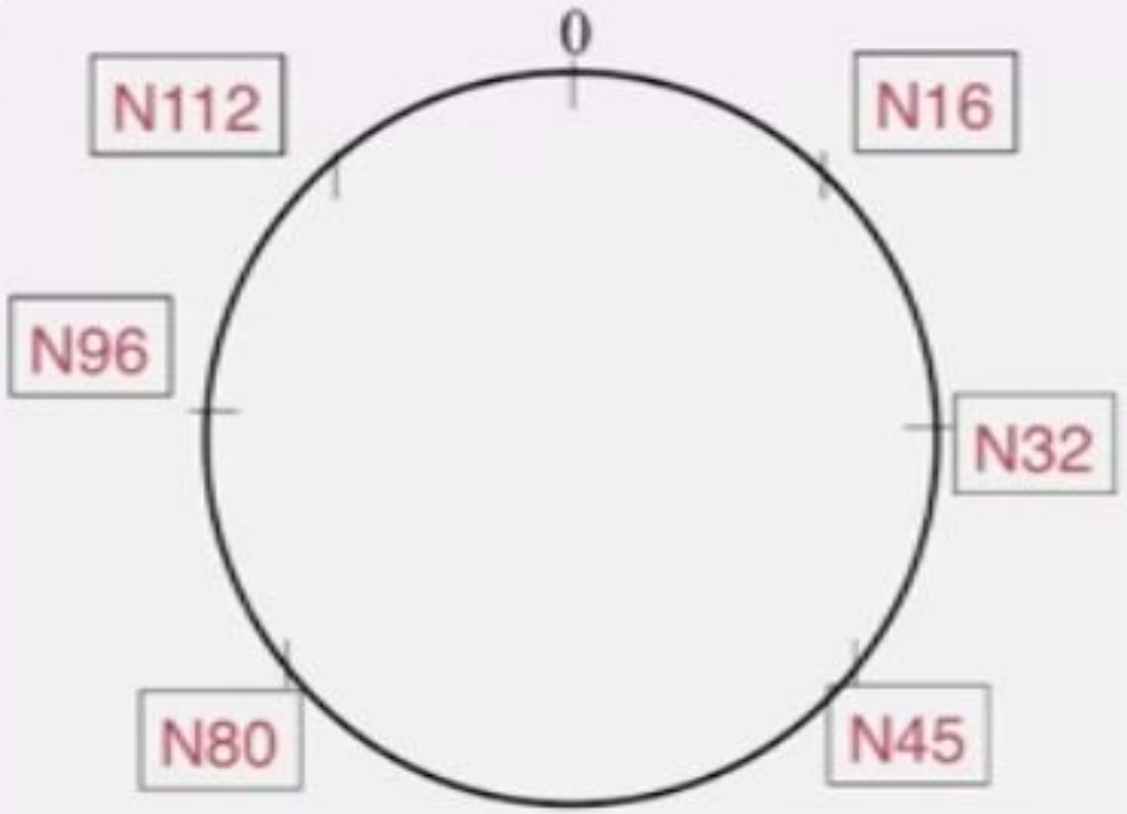
CHORD

- Developers: I. Stoica, D. Karger, F. Kaashoek, H. Balakrishnan, R. Morris, Berkeley and MIT
- Intelligent choice of neighbors to reduce latency and message cost of routing (lookups/inserts)
- Uses *Consistent Hashing* on node's (peer's) address
  - SHA-1(ip_address,port) → 160 bit string
  - Truncated to *m* bits
  - Called peer *id* (number between 0 and $2^m - 1$)
  - Not unique but id conflicts very unlikely
  - Can then map peers to one of 2^m logical points on a circle

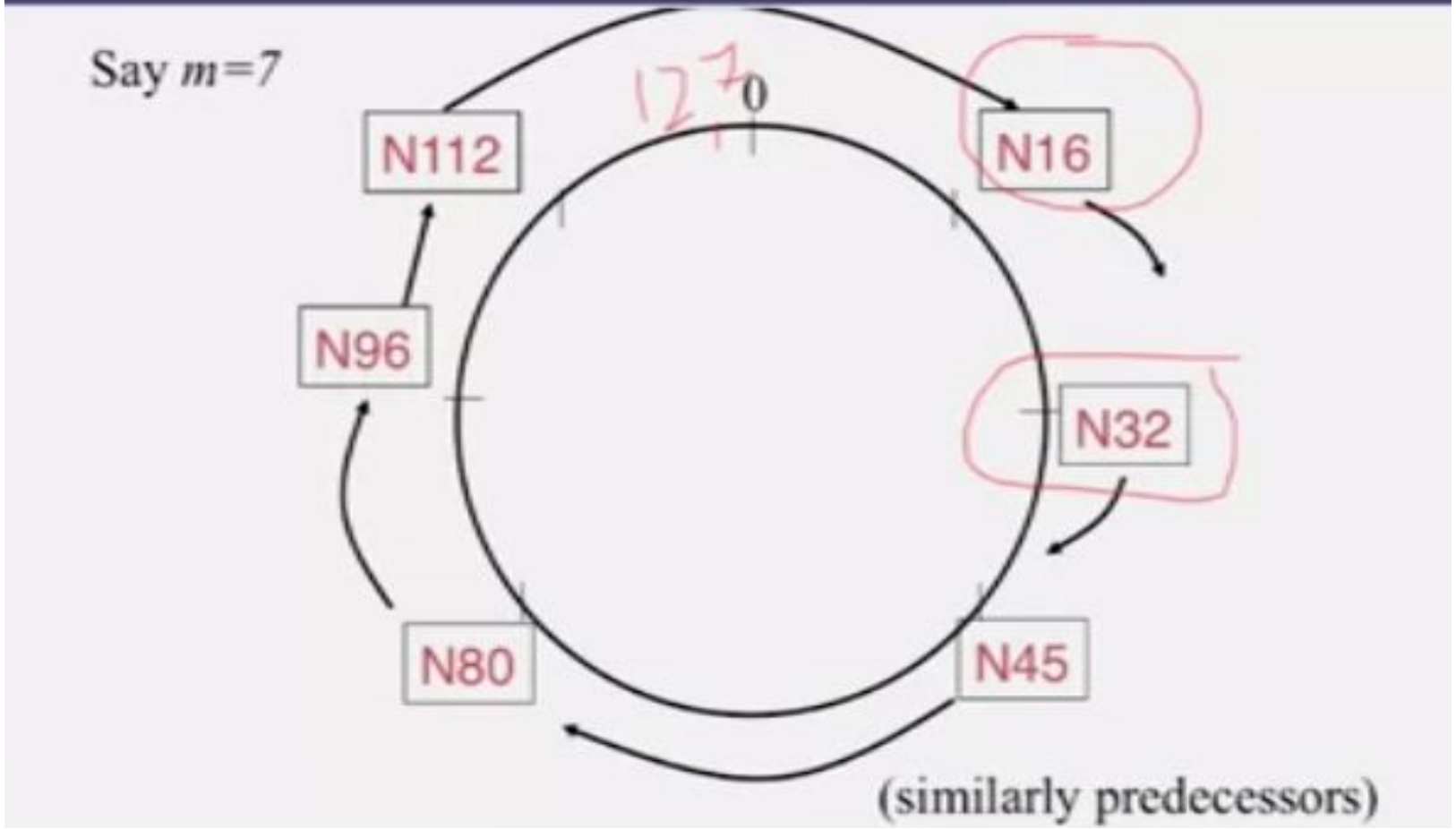
RING OF PEERS

Say $m=7$

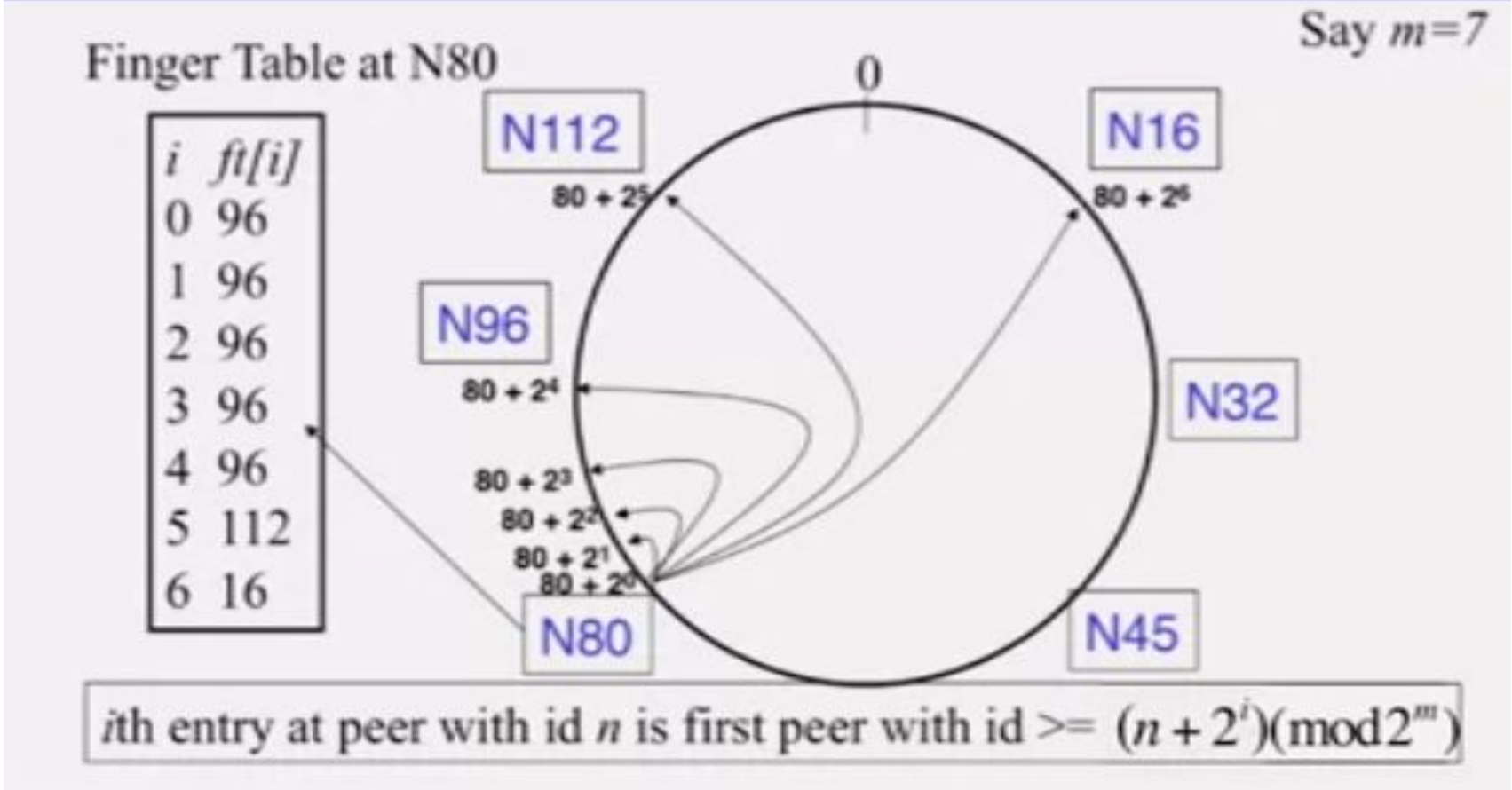
6 nodes



PEER POINTERS (1): SUCCESSORS



PEER POINTERS (2): FINGER TABLES



$80+2^6=144 \bmod 128$

Notes

https://wiki.zhen-zhang.com/tech/notes/books/Distributed/Distributed%20-%20Intro/

Thank you