Chord and CAN: Distributed Hash Tables

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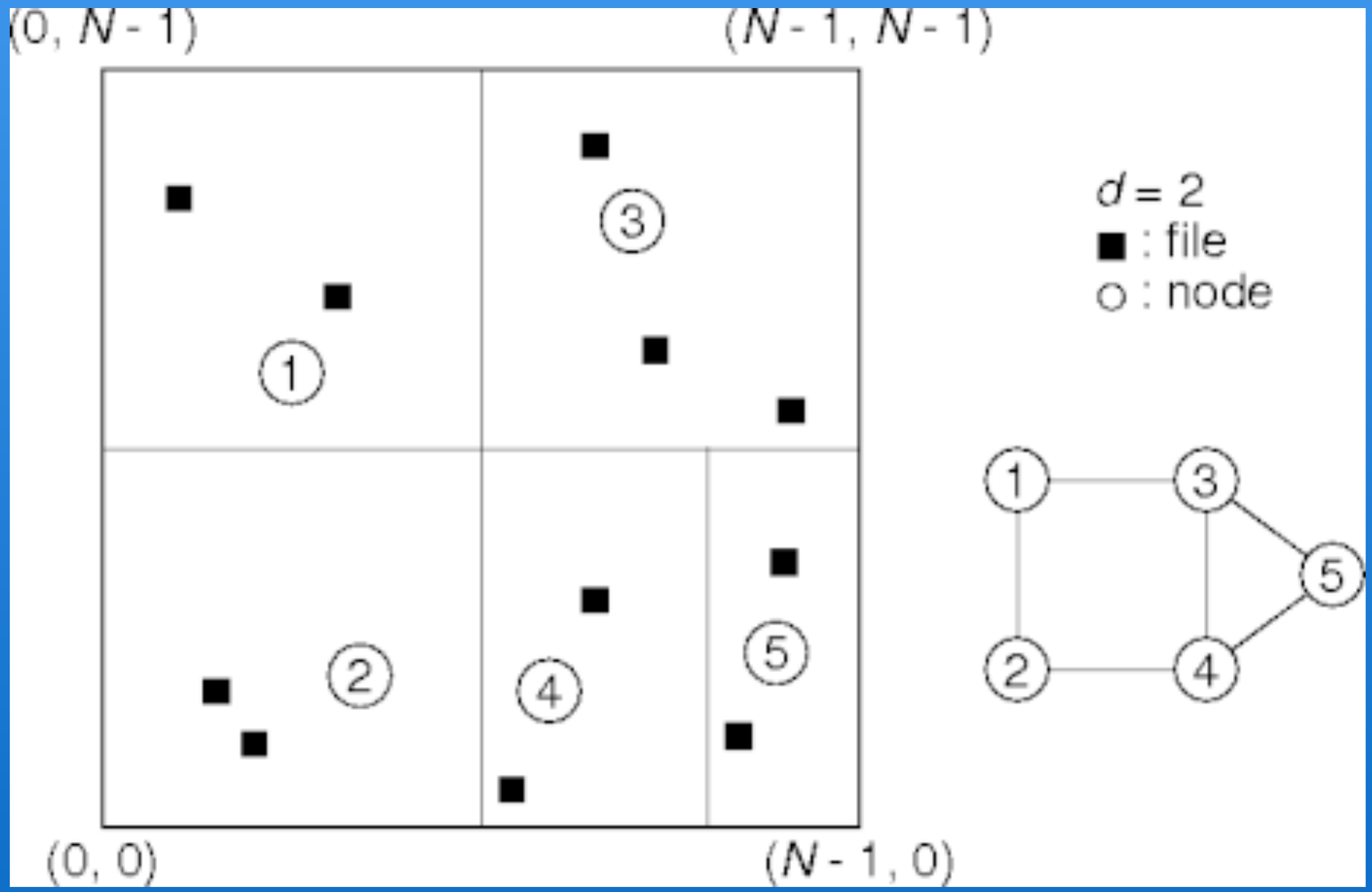
Distributed Hash Tables: What are They?

Content Addressable Networks

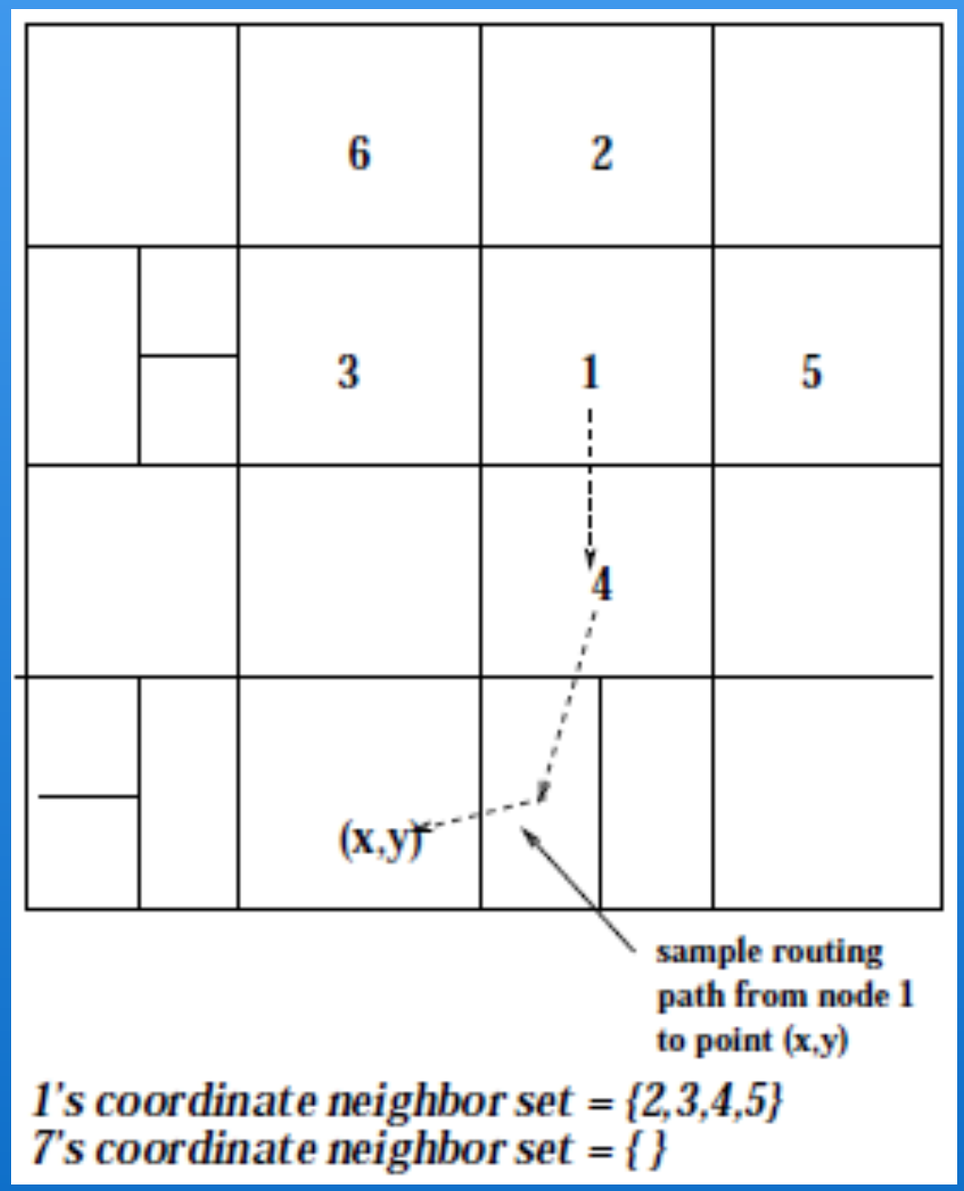
- Central Concept: Hyperspace
- Nodes -> pockets of space
- keys -> points in space

Content Addressable Networks



http://bluehawk.monmouth.edu/rclayton/web-pages/s10-305-503/hashaf6.png

Content Addressable Networks

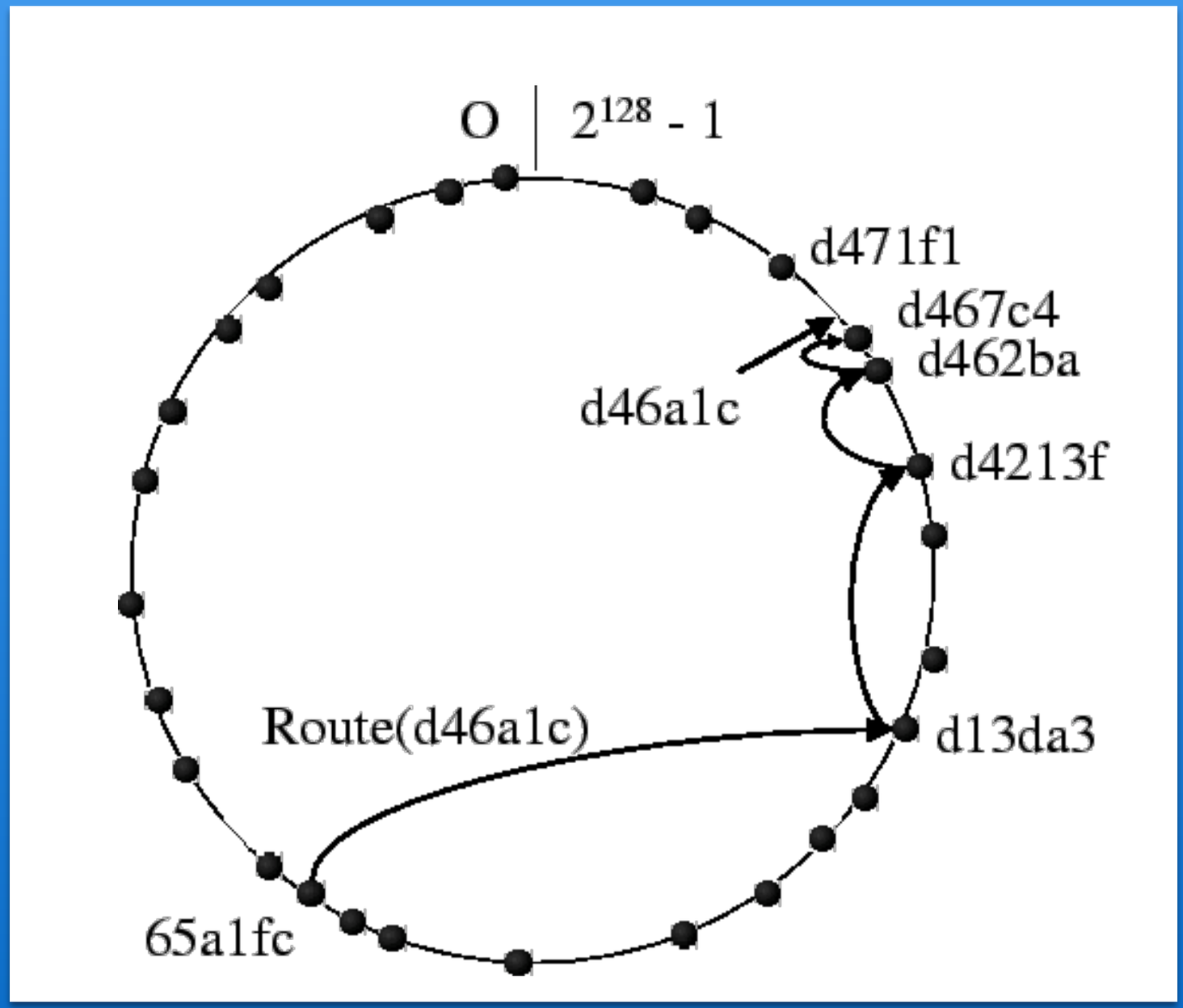


https://www.cs.rit.edu/~ark/spring2013/730/module05/fig02.png

Chord

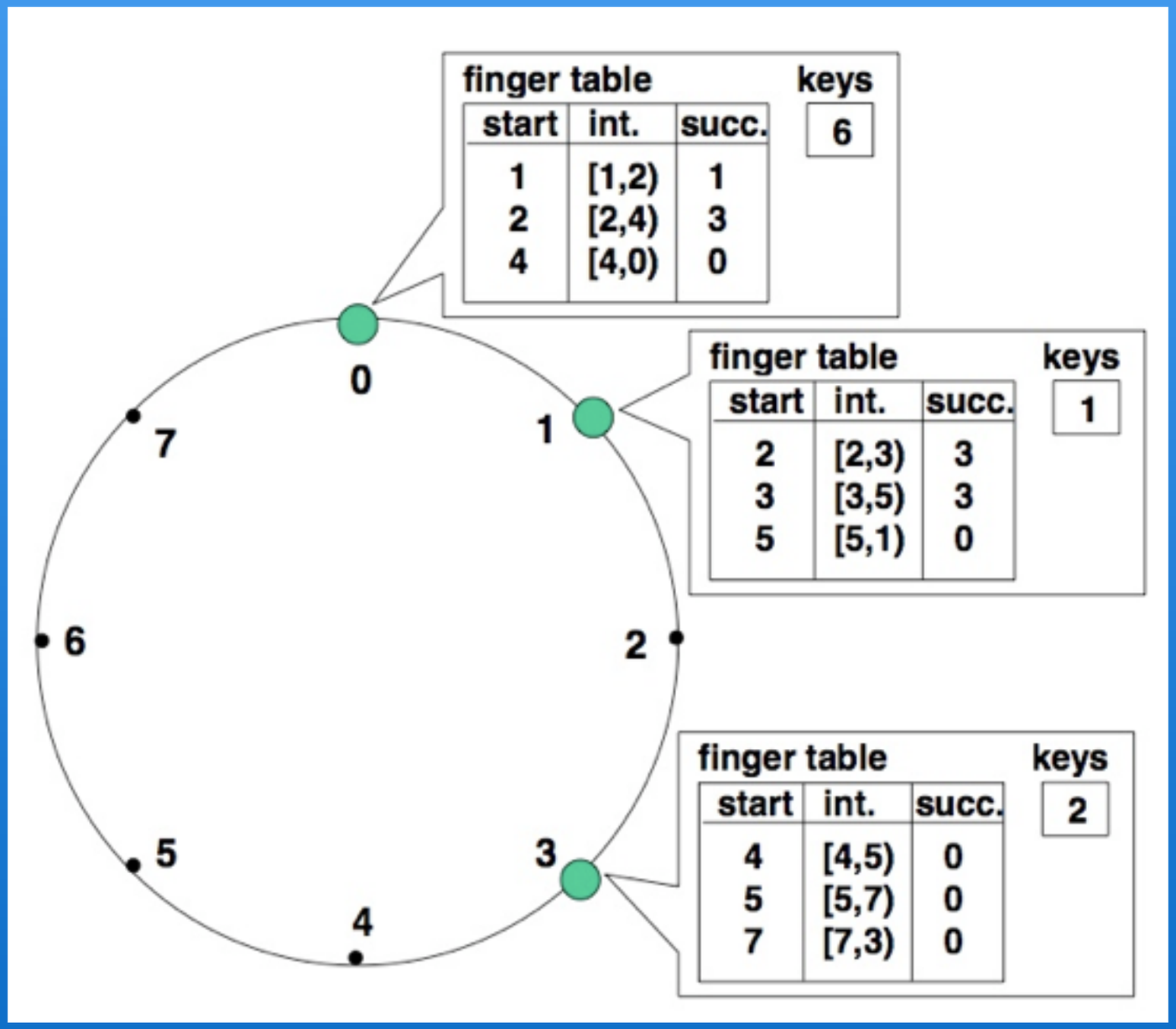
- Central Concept: Ring
- Nodes -> portion of ring
- keys -> points on the ring

Chord



https://www.usenix.org/legacy/publications/library/proceedings/osdi02/tech/full_papers/castro/castro_html/img15.png

Chord



http://www.dennislambing.com/wordpress/wp-content/gallery/chord-p2p/chordp2p3.jpg

Differences?

	Chord	**CAN**	**Tapestry**
Type of network	Ring	N-dimensional	Prefix routing
Routing	$O(\log n)$	$O(d \cdot n^{1/d})$	$O(\log_b N)$
State	$O(\log n)$	$O(d)$	$O(b \cdot \log_b N)$
Caching efficient	+	++	++
Robustness	-/+	+++	++
IP Topology-Aware	N	N/Y	Y
Used for other projects	+++	--	++

https://www.p2p.tu-darmstadt.de/fileadmin/user_upload/Group_P2P/share/p2p-ws10/Lecture_3-2.pdf

Final Thoughts

- CAN + Chord — just 2 types of DHTs
- Both came out in 2001—almost 15 years of time to further develop DHTs!

References

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