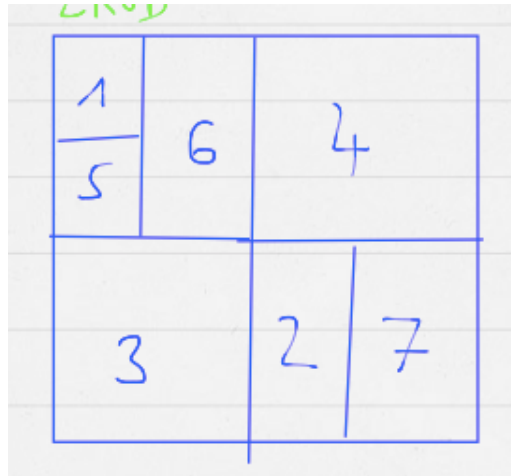
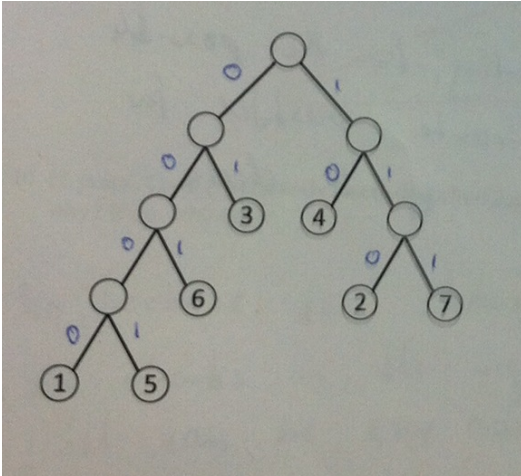


Advanced Internet Technology 2. Zulassungsklausur
WS 2012/ 2013 Prof. Wehrle
60 Minuten, 50 Punkte

1. Unstructured P2P: Advantages and Disadvantages of central component in a P2P + explain
++ easy bootstrapping, fast look up of content, authentication
-- bottleneck, single point of failure, easy attackable
2. Unstructured P2P: Explain Gnutella 0.4 and 0.6 and explain the improvement (4)
Gnutella 0.4: unstructured, decentralised - pure P2P, flooded Request Model, --high traffic
Gnutella 0.6: unstructured, hybrid P2P, superpeers (improvement), --high traffic in superpeers
3. Unstructured P2P: You have two pure P2P networks with similar Node, node degree, query TTL. How can you distinguish this.
4. How does the clustering coefficient influence the success Rate?
clustering coefficient high - more connections between nodes - higher density in network
5. pure P2P not necessarily returns hits even all nodes are reachable - why (2)
Flooding: time to live - false negatives (exists but not reachable)
6. Write the formal and logic formula of the power Law network (2)
(Rich get richer) The degree distribution was **power-law distributed**, i.e., the probability that a node in the network is connected to k other nodes is $P(k) \sim k^{-\gamma}$
7. Are Power Law networks robust against attacks?
no, because rich get richer nodes with high degree (hubs) are easy targets
8. DHT: two limitations (2)
i.) do not allow fuzzy query ii.) not robust against attacks
9. DHT: Correlation between the underlay and overlay (2)
real and logical topology most uncorellated
10. DHT: maximum number of nodes (1)
in generally it depends on implementation - Pastry: 2^{128} , Chord: 2^{160}
11. Chord: table with finger and id, which id's are possible (5) (siehe ZK 1)
12. Chord: Does the use of multi Hash to store content achieve Load Balance in Chords?
No?
13. CAN: Name advantages and disadvantages of very high-dimensional CAN DHT compared having only few dimensions (2)
++ more neighbours and shorter path
-- higher node states (more information needs to be saved in the nodes)

14. CAN: Below you find a partition tree representation of a CAN network after seven nodes have been inserted. Draw one valid CAN hypercube with $D = 2$. (4)



15. CAN: Consider the two routes given in the table below. What is the smallest number of hops for each routes in the hypercube form 14). (2)

15.1.1. From 6 to 7: 6 - 4 - 7 or 6 - 3 - 7

15.1.2. From 2 to 1: 2 - 4 - 1 or 2 - 3 - 1

16. Pastry: Geometrical structure of Pastry network? (1)
hybrid tree and ring

17. Pastry: The base of the identifier space is a configurable parameter in Pastry. It allows to trade-off between two key property of the system. Name these two properties and briefly explain in which way they change choosing a larger base over a smaller one. (3)
node state (higher - shorter routing time) -> routing performance get smaller
vice versa

18. Briefly explain the tree different steps for the routing procedure used by a Pastry node to route a query to a destination node (3)

1. check leaf set
2. longest prefix
3. determine entry
4. merge neighbourhood set, leaf set, routing table and route

19. BitTorrent: How are already running and new downloads in a BitTorrent network affected by a tracker failures? (2)

No effect on running downloads (if seeder present)
new downloads - tracker no organisation of swarm

20. Does BitTorrent's rarest-first chunk selection scheme work well for streaming media? Why? (1)

No, because you need the right order of media content.

21. i3: Explain using brief examples the three communications/ addressing forms that are enable by i3. (3)

single communication:

anycast communication: trigger with common prefix + postfix

multicast communication: each receiver sets a trigger