1.

Napster servers, as discussed in lecture, *do not* store which of the following? (1 point)

○

File pointers, i.e., (filename, peer address) pairs

○

Addresses of other Napster servers

○

Addresses of some of the peers (clients)

◉

Files

2.

Which of the following Gnutella messages are flooded out and TTL restricted? (1 point)

◉

QueryHit

○

Take

○

Query

○

Pull

3.

In BitTorrent, a newly joined leecher X is trying to download a file with 6 blocks B1–B6. X has 3 neighbors: A, B, and C. These neighbors are storing the following blocks of the file: A: {B1, B2, B4, B5}; B:{B2, B3, B4, B5, B6}; C:{B1, B2, B6}. Then X will prefer downloading which block first? (1 point)

○

B6

○

B3

○

B4

◉

B2

4.

A Pastry DHT has a peer P with the following neighbors. P currently has to route a query to key 101011001111. Which of the following neighbors is the best next-hop for this query? (1 point)

○

101001011010

◉

101011001110

○

101001011111

○

101001011000

5.

In a Pastry DHT that is locality-aware, the path of a query is very likely to: (1 point)

○

Take equal-sized network jumps in its early hops and in its later hops

○

Take short network jumps in its early hops and long network jumps in later hops.
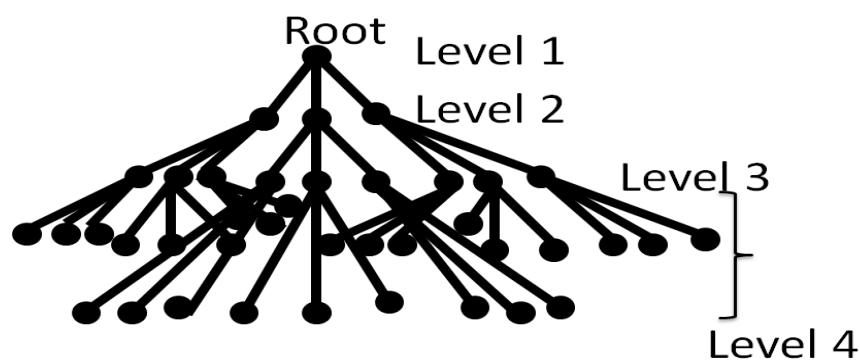
◉

None of the above.

○

Take random-sized network jumps throughout its path

6.

A Gnutella topology looks like a balanced ternary tree with 4 levels of nodes, i.e., peers, as shown in the picture below. Thus, there is 1 root at Level 1, which has 3 children at Level 2, which each have 3 children at Level 3, which in turn each have 3 children at Level 4 – thus, there are a total of 40 nodes.

If the root node (Level 1) sends a Query message with TTL=2, then what are the number of nodes receiving the Query message, not including the originating node? Enter your answer as a numeric value in the text box below. (1 point)

24

7.

A Gnutella topology looks like a balanced ternary tree with 5 levels of nodes, i.e., peers. Thus, there is 1 root at Level 1, which has 3 children at Level 2, which each have 3 children at Level 3, which in turn each have 3 children at Level 4, which in turn each have 3 children at Level 5 – thus, there are a total of 121 nodes.

If a leaf (Level 5) node sends a Query message with TTL=2, then what are the number of nodes receiving this message, not including the originating node? Enter your answer as a numeric value in the text box below. (1 point)

18

8.

A Gnutella topology looks like a balanced ternary tree with 4 levels of nodes, i.e., peers, as shown in the picture below. Thus, there is 1 root at Level 1, which has 3 children at Level 2, which each have 3 children at Level 3, which in turn each have 3 children at Level 4 – thus, there are a total of 40 nodes.

If a child of the root (i.e., a Level 2 node in the tree) sends a Query message with TTL=3, then what are the number of nodes receiving the Query message, not including the originating node? Enter your answer as a numeric value in the text box below. (1 point)


64
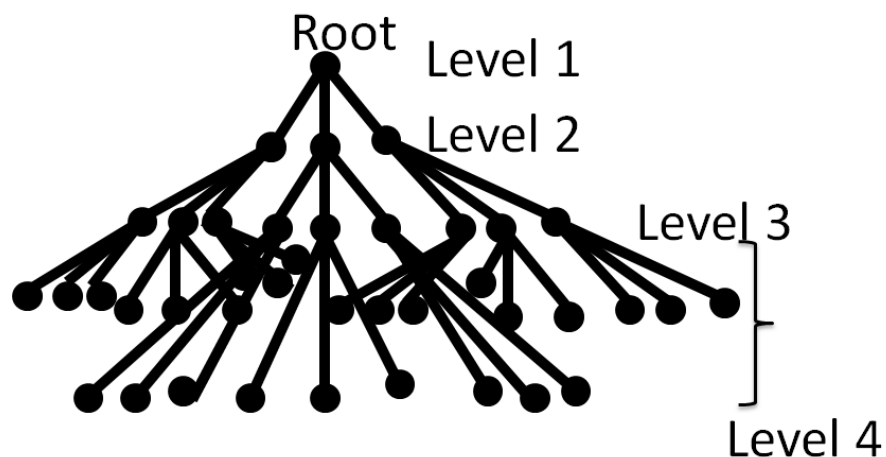
9.

A Gnutella topology looks like a balanced ternary tree with 4 levels of nodes, i.e., peers, as shown in the picture below. Thus, there is one root at Level 1, which has 3 children at Level 2, which each have 3 children at Level 3, which in turn each have 3 children at Level 4 – thus, there are a total of 40 nodes.

If the originating node of the Query is a leaf (Level 4 node), what is the minimum TTL to ensure all nodes in the system receive the Query? Enter your answer as a numeric value in the text box below. (1 point)

56
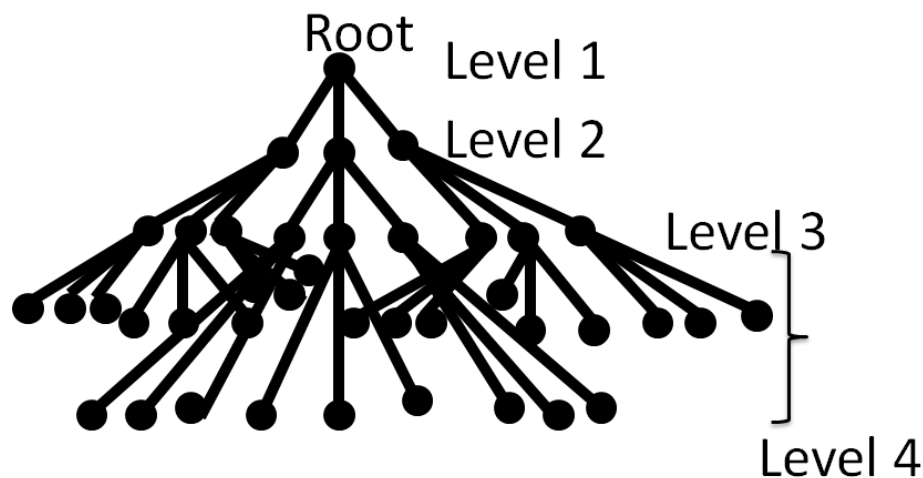
1
point

10.

In a Chord ring using m = 8, nodes with the following peer ids (or node ids) join the system: 45, 32, 132, 234, 99, 199. What node id is the file with id 120 stored at (assuming only one replica)? Enter your answer as a numeric value in the text box below. (1 point)

32

1
point

11.

In a Chord ring using m = 9, nodes with the following peer ids (or node ids) join   the system: 1, 12, 123, 234, 345, 456, 501. Which of the following nodes is **not present** as a finger table entry or successor of 234? (1 point)

○

345

◉

456

○

501

○

1

1
point

12.

In a Chord ring using m = 9, nodes with the following peer ids (or node ids) join the system: 1, 12, 123, 234, 345, 456, 501.

Node 234 initiates a search (query) for key 10. What is the comma-separated list of all nodes traversed by this query, including the final destination (including both originating node and final node)?

Use the text box below to **enter your answer as a sequence of numeric values with each numeric value separated by a comma. Please ensure you enter the node ids in the order traversed, and include both starting and ending nodes in the sequence.** (1 point)

| |
12, 12, 446, 123, 501, 345, 231

1
point

13.

In a Chord ring using m = 9, nodes with the following peer ids (or node ids) join   the system: 1, 12, 123, 234, 345, 456, 501. If node 234 fails, which of the following nodes will not update any of their finger table entries or successors? (1 point)

○

456

○

501

○

1

⦿

12

14.

In a Chord ring using m = 8, nodes with the following peer ids (or node ids) join the system: 45, 32, 132, 234, 99, 199. If node 45 fails, then what is the comma-separated list of all the nodes whose finger tables need to be updated?

Use the text box below to **enter your answer as a sequence of numeric values with each numeric value separated by a comma. Please ensure you list nodes in increasing order of id.** (1 point)

14. 234, 132, 45, 32, 199, 99