

## Unit 4 - Week 02: Logarithmic Partitioning of Node ID Space and Index Entry Authenticity, Implementation of Voice Over Internet Telephony in P2P Way, Leaf node, Core node and Type of Messages in DHT Networks, Static and Dynamic Partitioning of Node ID Space: Fixed and floating partitioning

### Course outline

How does an NPTEL online course work?

### Week 0

Week 01: P2P Networks – Motivation, Basics – Cryptographic Hash, Public Key Cryptography Principles, Security Certificates, Structured and Unstructured P2P Networks, Inconsistent Hashing, Consistent Hashing, Rendezvous Hashing, Locality Preserving Hashing, Distributed Hash Tables

Week 02: Logarithmic Partitioning of Node ID Space and Index Entry Authenticity, Implementation of Voice Over Internet Telephony in P2P Way, Leaf node, Core node and Type of Messages in DHT Networks, Static and Dynamic Partitioning of Node ID Space: Fixed and floating partitioning

● Lecture 04: Logarithmic Partitioning of Node ID Space and Index Entry Authenticity

● Lecture 05: Implementation of Voice over Internet Telephony in P2P Way

○ Lecture 06: Leaf Nodes, Core Nodes and Type of Messages in DHT Networks

● Lecture 07: Static and Dynamic Partitioning of Node ID Space: Fixed and Floating Partitioning

○ Quiz : Assignment\_2

○ Feedback For Week 2

○ Solution: Assignment-02

Week 03: DHT Routing Protocol : Pastry and Kademlia

Week 04: Tapestry Routing Protocol, Multi-dimensional Distributed Hash Table, and Multi-Layer DHT

Week 05: Keeping <Key, Value> Pairs at Correct Root Nodes, Abrupt and Graceful Exit of Root Node, Resilience of <Key, Value> Pairs, Distributed File System, Storage Space Problem and Incentives to Share Storage

Week 06: P2P Nodes Communications Challenges in Heterogeneous Network Environments, P2P Overlaid Multicast, and A Design of P2P Email System

Week 07: P2P Mailing List Services, P2P Web, P2P Search Engine, On Being Anonymous and P2P in Blockchain

Week 08: P2P Anonymous Communication, The Anonymous Communication on the Internet through TOR Network, An Introduction to TOR Browser, Hidden Services on TOR Network, and Summary of the Course

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## Assignment\_2

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2020-09-30, 23:59 IST.**

1) Which of the following statement/s is/are TRUE for peer to peer network? 1 point

- It uses Domain Name Servers for its authentication.
- It uses logarithmic partition for finding the root node of a newly joined node.
- It uses rendezvous hashing for DHT routing protocols.
- Discussion forums are one of the most commonly used Peer-to-Peer networks.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*It uses logarithmic partition for finding the root node of a newly joined node.  
Discussion forums are one of the most commonly used Peer-to-Peer networks.*

2) Consider the following statements. 1 point

- i. Multi-dimensional indexing falls into two basic categories; first is reducing the dimensionality, the second is partitioning the multi-dimensional space.
- ii. Space partitioning is recursively subdividing space to yield regions that contain a relatively small number of keys.
- iii. Indexing structures are known as space partitioning indexes, and they function by iteratively subdividing space to smaller spaces.
- iv. A malicious node in an indexing structure cannot misdirect queries but can manipulate them, give false answers.

Which of the following statement/s is/are **NOT** correct? Select the correct code.

- i, iii
- ii, iv
- iv
- None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*iv*

3) Which of the following statement/s is/are TRUE for VoIP? 1 point

- A node wants to connect another node using the publish message.
- A node can join the DHT network using its node ID.
- The callee node can be searched using finding nodeID of callee from the root of hash(phone number or emailID).
- VoIP and SIP use the similar type of indexing.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*A node can join the DHT network using its node ID.  
The callee node can be searched using finding nodeID of callee from the root of hash(phone number or emailID).*

4) Which of the following statement/s is/are TRUE to avoid denial of service attacks in the DHT network? 1 point

- The public, private keys generated together and public key with signed hash is used as nodeID.
- Node IDs generation is a random process and it's create non-uniformity in the DHT network.
- Digital signatures can be used for authentication of a node.
- Multiple root nodes can be allocated for a node.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*The public, private keys generated together and public key with signed hash is used as nodeID.  
Digital signatures can be used for authentication of a node.*

5) Which of the following statement/s is/are TRUE for the implementation of B4 system? 1 point

- The email address of a node can be used as a node ID.
- Node ID is the private key of that node.
- The probability of getting the node ID that is already in the network for a newly joined node is low.
- The same messages type as used in VoIP, are used in B4.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*The probability of getting the node ID that is already in the network for a newly joined node is low.  
The same messages type as used in VoIP, are used in B4.*

6) For the large group conference call setup, which of the function will be preferably needed for good voice quality? 1 point

- The user clients can use squelch to reduce unnecessary sound.
- A mixer can be used to avoid noise.
- Set a threshold on the number of participants.
- All of the above.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*The user clients can use squelch to reduce unnecessary sound.*

7) Which of the following nodes maintain routing entries in the DHT? 1 point

- Leaf node
- Core node
- Both Leaf node and Core node
- None of the above nodes

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Both Leaf node and Core node*

8) What is/are the role/s of the core nodes? 1 point

- Periodically merge the received routing tables and their source nodes into the existing routing tables.
- Participate in the DHT network for routing.
- Periodically sends updates to the nodes listed in routing tables and nodes from whom routing tables or heartbeat packets are received.
- All of the above.

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*All of the above.*

9) What type of message/s can be used for sandboxed virtual machine based on destination identification? 1 point

- Root(Source Node ID)
- Root(Destination Node ID)
- Root(hash(Source Node ID))
- Root(hash(Destination Node ID))
- Root(hash(key))

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*Root(hash(Source Node ID))*

10) Consider the following statement/s about DHT networks. 1 point

- i. Nodes and objects are assigned IDs from common space via a distributed hashing.
- ii. The DHT network assigns keys to data items and organizes its peers into a graph that maps each data key to a peer. This structured graph enables the efficient discovery of data items using the given keys.
- iii. There is a trade-off between the maximum number of hops and the size of the routing tables. In general, the larger the routing table, the fewer the number of hops, and vice versa.
- iv. A DHT is said to construct an overlay network because its nodes are connected over an existing network, such as the Internet, which the overlay uses to provide its own routing functionality. The existing network is then referred to as the underlay network.

Which of the following statement/s is/are **NOT** correct? Select the correct code.

- i
- ii
- iii, iv
- None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:

*None of the above*