LTAT.06.007 Distributed Systems
Seminar 9 - Naming

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Tartu, Estonia April 15, 2020
Quiz 9

Questions are based on the Naming lecture

Short answers

Link to quiz – https://tinyurl.com/vceh6pl

Quiz will be available until April-13-2020:23.59
1. **What are the specific properties of an Identifier?**

A true identifier is a name that has the following properties:

1. An identifier refers to at most one entity.
2. Each entity is referred to by at most one identifier.
3. An identifier always refers to the same entity (i.e., it is never reused).
2. Name two methods that can be used to resolve names and locate entities in a flat naming scheme.

Broadcasting and forwarding pointers.
3. What is the purpose of the Address Resolution Protocol (ARP) in Local Area Networks (LAN) s?

To find the data-link address of a machine when given only an IP address.
4. What are the main challenges of using forwarding pointers when locating mobile entities?

- Long expensive chains
- Burden on intermediate locations
- Vulnerability to broken links
5. Briefly explain the principle of mobile IP concerning the home-based approach.

Each mobile host uses a fixed IP address. All communication to that IP address is initially directed to the mobile host’s home agent. This home agent is located on the local-area network corresponding to the network address contained in the mobile host’s IP address.

Whenever the mobile host moves to another network, it requests a temporary address that it can use for communication. This care-of address is registered at the home agent. When the home agent receives a packet for the mobile host, it looks up the host’s current location. If the host is on the current local network, the packet is simply forwarded. Otherwise, it is tunneled to the host’s current location, that is, wrapped as data in an IP packet and sent to the care-of address. At the same time, the sender of the packet is informed of the host’s current location.
Name spaces for structured names can be represented as a labeled, directed graph with two types of nodes. Briefly explain them.

A **leaf node** represents a named entity and has the property that it has no outgoing edges. A leaf node generally stores information on the entity it is representing—for example, its address—so that a client can access it.

A **directory node** has a number of outgoing edges. Stores a table in which an outgoing edge is represented as a pair (node identifier, edge label). Such a table is called a directory table.
This figure shows a general naming graph with a single root node. Name A, B, and C accordingly.
8. What is the purpose of the closure mechanism in name resolution?
9. In this figure, the node n5 can be referred to by two different path names. Please name them. What is the Unix terminology for such path names?

Hard links
10. What do you mean by mounting in name resolution?

Merge different name spaces in a transparent way
11. What are the logical layers of a hierarchically organized large-scale worldwide-distributed name space? Explain them briefly.

Global level: Consists of the high-level directory nodes. Main aspect is that these directory nodes have to be jointly managed by different administrations.

Administrational level: Contains mid-level directory nodes that can be grouped in such a way that each group can be assigned to a separate administration.

Managerial level: Consists of low-level directory nodes within a single administration. Main issue is effectively mapping directory nodes to local name servers.
12. What are the two types of name resolution implementations methods in large-scale name services?

Iterative name resolution

Recursive name resolution
13. In the previous question, which approach is efficient than the other? Why?

Recursive name resolution

- Recursive name resolution allows each name server to gradually learn the address of each name server responsible for implementing lower-level nodes. As a result, caching can be effectively used to enhance performance.
- Communication costs may be reduced.
14. What do you mean by a “domain name” in the DNS name space?

A path name to a domain’s (a node’s) root node is called a domain name.
15. What is the purpose of the resource record MX in the DNS name space?

The MX (mail exchange) record is like a symbolic link to a node representing a mail server. For example, in this figure, the node representing the domain hydra.helsinki.fi has an MX record containing the name mail.cs.helsinki.fi, which refers to a mail server. That server will handle all incoming mail addressed to users in the hydra.helsinki.fi domain.
16. What are the first five attributes of the lightweight directory access protocol (LDAP)

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Thank You !!