15 - Naming

Prof version

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Question 1

Describe the Home-Based Approach. What is its main drawback?

Solution 1

An example where the home-based approach is followed is in Mobile IP. 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. In the case of IPy6, it is realized as a network-layer component. Whenever the mobile host moves to an- other 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.

A drawback of the home-based approach is the use of a fixed home location. For one thing, it must be ensured that the home location always exists. Otherwise, contacting the entity will become impossible. Problems are aggravated when a long-lived entity decides to move permanently to a completely different part of the network than where its home is located. In that case, it would have been better if the home could have moved along with the host.

Question 2

Consider the DNS query shown in Figure 1 . State what kind of resolution it uses, (recursive or iterative), and explain why? Consider each step from 1-8 and explain the steps taken to resolve www.google.com to its IP address.

Solution 2

Since the main burden is not on the contacted name server and a name server queries "iteratively" which means that it queries several name servers in turn until it finds an answer it is an iterative query.

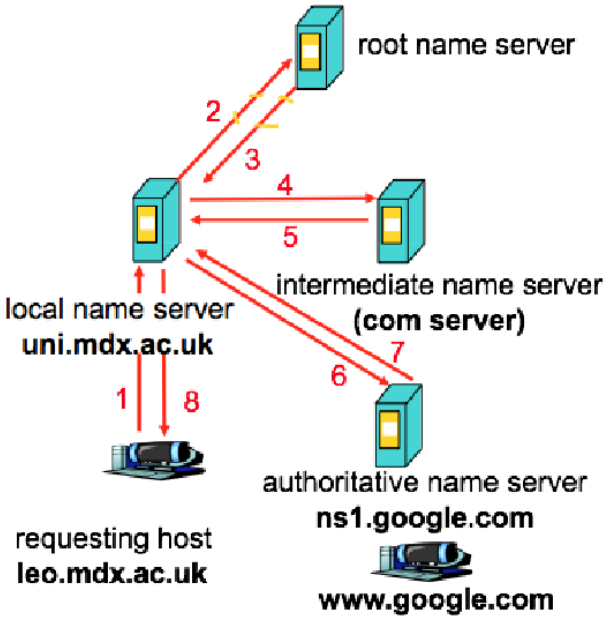

Figure 1: DNS query

- The local client asks the local name server for the IP address of www.google.com.
- The local name server does not know the IP address of www.google.com therefore it asks to the root server.
- The root name server does not know the IP address of www.google.com, but it does know the IP address of the name server for TLD so it tells this to the local name server.
- The local name server asks TLD name server for the IP address of www.google.com.
- TLD name server does not know the IP address of www.google.com, but it does know the IP address of ns1.google.com (who may know the mapping) so it tells this to the local name server.
- The local name server asks ns1.google.com for the IP address of www.google.com.
- ns1.google.com name server is authoritative for its zone so it can supply the IP address of www.google.com
- The local name server passes the IP address of www.google.com to the local client

Question 3

Consider the DNS query shown in Figure 2 . State what kind of resolution it uses, (recursive or iterative), and explain why? Consider each step from 1-8 and explain the steps taken to resolve www.google.com to its IP address.

Solution 3

Since the main burden is on the contacted name server which in turns will contact a different server this is a recursive name resolution. The chain of calls will stop when the answer is found.

- The local client asks the local name server for the IP address of www.google.com.
- The local name server does not know the IP address of www.google.com therefore it asks to the root server.

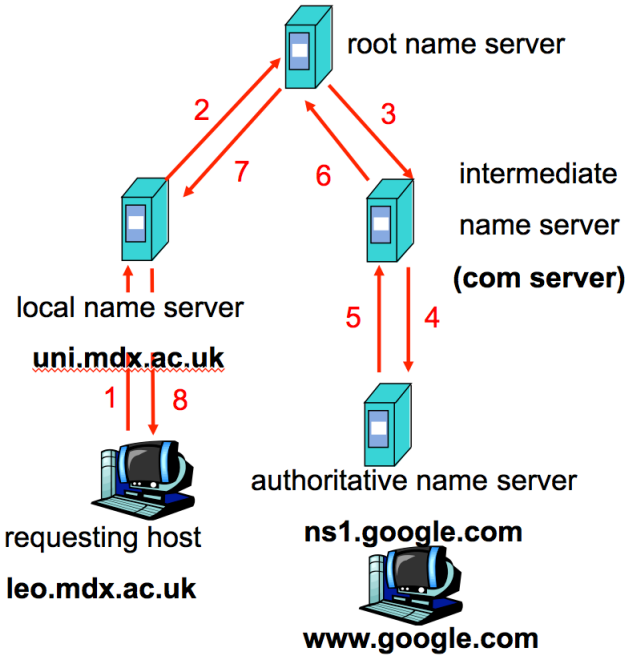

Figure 2: DNS query

- The root name server does not know the IP address of www.google.com but it does know the IP address of the name server for TLD so it asks to the TLD.
- TLD name server does not know the IP address of www.google.com, but it does know the IP address of ns1.google.com (who may know the mapping) so it asks him.
- The ns1.google.com server replies back to the TLD server.
- The TLD replies back to the root server.
- The root replies back to the local name server which in turn replies back to the requesting host.