Naming - Disposition

Lukas Peter Jørgensen, 201206057, DA4

27. marts 2014

1 Terminology

Entity	A machine, a process, a file etc.
Access point	An entity at which other entities can be located. E.g. a process can be located at a given machine.
Name	A string of bits or characters that is used to refer to an entity
Address	A name that refers to an access point of an entity
Identifiers	A name which uniquely identifies an entity
Human-friendly names	A character string name that is understandable by a human.
Flat naming	Name gives no hints on location (E.g. a random string like 00:11:22:33)
Structured naming	Name describes how to locate object (E.g. a URL)
Attribute-based naming	E.g. /C=DK/O=AU/OU=Comp.Sc.

2 Flat names

2.1 Address Resolution Protocol (ARP)

Name: IP Address, the "logical name"at this level.
Address: MAC Addres, the accesss point on the ethernet network
Method:

- Machines know their name and address.
- To locate the address with name N, broadcast a packet P with N.
- Receivers check whether they have name N and if so, report back with their address.

2.2 Mobility

- Name constant.
- Access point changes.

Solutions

Using an ARP-like protocol, the entity could multicast new location to group when it has moved, or the node can broadcast for new location of entity when needed.

Forwarding pointers, leave a breadcrumb everytime the entity moves from A to B, so clients can find the entity at B by following the breadcrumb at A that point to B.
Pros: Simplicity
Cons: If the entity is highly mobile, the trail can become very long, the trail has to be maintained at every crumb. It's very vulnerable as well, if one crumb is missing, the whole chain is broken.

Home-based approach, have a static home agent, that redirects all to an ip-address that the mobile-host can update when it receives a new ip address.
Cons: If the mobile-host is permanently moved far away from the home-host, then requests will take a longer time than if the home-host had moved with it.

3 Distributed Hash Table

$succ(key)$ = smallest identifier larger than key.
E.g. if identifiers = $\{1, 4, 7, 12, 15\}$ then $succ(9) = 12$ and $succ(12) = 12$

Lookup: Given key, find $succ(key)$ and the address of the peer with identifier $succ(key)$. Naïve solution takes time $O(N)$

Finger tables

Notation	Definition
$finger[k]$	first node on circle that succeeds $(n+2^{k-1})$ mod 2^m, $1 \leq k \leq m$
successor	the next node on the identifier circle; $finger[1].node$
predecessor	the previous node on the identifier circle