

Computer Communications - CSC1 551

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Context

- 1982: fairly early on in the net
- Ethernet only a few years old
- basic networking terminology still evolving
- background for routing (next class)

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Terminology

- Name:** what you want
- Address:** where it is
- Route/path:** how to get there
- Binding:** process of mapping a name to an address
- e.g., DNS maps host name to IP address, DHCP maps MAC address to IP address, C library call maps service to port, maps MAC address to interface
- [Context]:** the state needed to do binding

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Characteristics of Names

- Ex: difference between IP addresses, hostnames, MAC addresses, etc.
- Uniqueness:** globally unique, unique in some context (locally unique), probabilistically unique, not unique
- Length
- User friendliness - human readable
- alphabets vs. binary
- moderate length vs. long
- memorable vs. not memorable
- easily transcribable vs. more difficult
- Hierarchical vs. Flat
- Assigned from a central authority vs. distributed

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CS551

On Naming (RFC 1498)

[Saltzer82a]

Bill Cheng

<http://merlot.usc.edu/cs551-f12>

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Key Ideas

- Defining the terms (objects) for naming
- Binding:** mapping names to addresses
- Give characteristics of names

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Naming and Change

- Naming only matters because things change
- if no change, things can be hard-coded
- Ex: users/services/machines move, processes start and stop, etc.
- mobile hosts, web services, both for content and virtual hosts (multiple websites on single computer), load balance

Nodes vs. Interfaces

What does an IP address identify?

= *interface* (network attachment point), not a node

Why?

= to control where the packets go

= so firewall rules can tell "outside"

from "inside"

Problems?

= sometimes you want to get to

the node and an interface is

too specific (e.g., if it's down)

More on naming in CSCI555

