CS551
On Naming (RFC 1498)
[Saltzer82a]

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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)
Key Ideas

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

- **Uniqueness:** globally unique, unique in some context (locally unique), probabilistically unique, not unique

- **Length**

- **User friendliness - human readable**
  - alphabetic 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**
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