CS551
On Naming (RFC 1498) [Saltzer82a]

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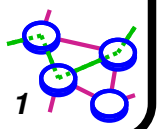
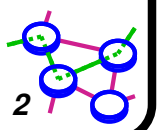
http://merlot.usc.edu/cs551-f12



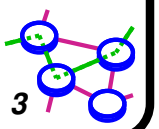
Context

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



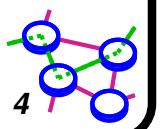
Key Ideas

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



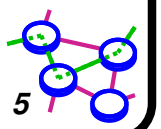
Terminology

- ***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**



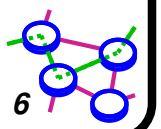
Naming and Change

- 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

- 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
  - alphabetics 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