Computer Networks

Acknowledgements

- Slides contain material adapted from lecture notes developed by
  - Authors of "Computer Networks" book by Andrew Tanenbaum & David Wetherall

- Slides contain images from other online resources

What is a network?

"A group or system of *interconnected* people or things"

Example networks

- *Postal* network
    - Delivers letters/packages between sender & receiver
    - Sender & receiver identified by *postal address*

Example networks

- Plain old *telephone* network
  - Provides voice communication between users
  - User identified by *telephone number*

Computer Network

- Provides communication between *computers*
  - I.e., computers can *exchange* data

What can computer networking give us?

- *Communication* or information sharing
  - E.g., electronic mail, message broadcast, etc.

- *Resource sharing* (both hardware & software)
  - E.g., printers, disks, application software

- *Remote* computing (location *independence*)
  - Geography need not be a restriction!

- ...

Computer Network

- Provides communication between *computers*
  - I.e., computers can *exchange* data

- Need a way to *identify* computers
  - In the Internet, this is done via *IP addresses*

IP address

- IP address identifies any device connected to the Internet

- IPv4 *dotted decimal* notation
  - Four 8-bit numbers separated by dots
  - 10101100 00010000 00000000 01100100 → 172.16.0.100

- IPv6 notation
  - 8 groups of 4 hexadecimal digits each separated by colons
  - 2001:0DB8:0000:0000:0000:ff00:0042:8329