Slide 1

Administrivia

- Homework 3 on Web; due Friday. Homework 4 coming soon.
- Information about projects coming soon.

Slide 2

Some Basics of TCP

- TCP (Transmission Control Protocol) defined in terms of multiple layers, from application layer to physical layer. (See Exhibit A, p. 266.)
- As a message moves "down" this stack, each layer adds its own header info; moving up the stack reverses the process.
- "TCP/IP" encompasses several protocols, including TCP and UDP.

Slide 3

Network Addresses

- MAC (media access control) addresses — hardware level.
- IP (Internet protocol) addresses — globally unique (with some caveats), mapped to MAC addresses by lowest level of TCP/IP.
- Hostnames — mapped to IP addresses in several ways, including `/etc/hosts` file and DNS.

Slide 4

IP Addresses

- IP address is 4 bytes, typically written byte-by-byte, e.g., 127.0.0.1. (We'll ignore IPv6.)
- IP address consists of network part and host part. Originally, partitioning of 4 bytes into these two parts done on the basis of "class"; now typically defined by netmask.
- NAT (Network Address Translation) allows a local network to communicate via internal addresses, with a router translating them for communication with the outside world. A.k.a. "IP masquerading". This is what we're doing with our little network of machines for this class.

Slide 5

DHCP and PPP

- DHCP (Dynamic Host Configuration Protocol) — common way of assigning IP addresses dynamically. Obvious advantages, though some disadvantages.
- PPP (Point-to-Point Protocol) — protocol for communicating over dial-up lines.

Slide 6

Routing

- When you send something to a given IP address, how does it get to its destination?
- "Routing table" (in kernel) defines where messages are sent. Built from various sources. Examine with `netstat -r`.

  Examine/change interface configuration(s) with `ifconfig`.

Slide 7

Configuration Files

- All (most?) systems — `/etc/hosts` (hostname, IP address, static mappings) and `/etc/resolv.conf` (DNS server).
- Other files system-specific. For Linux, `/etc/sysconfig/network` and `/etc/sysconfig/networking-scripts/*`.

Slide 8

Minute Essay

- There are lots of network-related things we could talk about:
  - DNS (Domain Name System), including setting up a machine to act as a DNS server.
  - NFS (Network File System).
  - Mail.
  - Web service.
  - Interfacing with Windows networks.

  Which of these are of particular interest to you? any you don't care about? any you already know as much about as you want to? anything I've left out?