Introduction

CIS-3152: Network Programming
Vermont Technical College
Peter C. Chapin

What's This Course About?

- Builds on CIS-2151
  - 75% (or so) on upper layers of OSI model
    - Client/Server programming
    - Application level protocols
    - Data exchange issues
      - Character sets
      - XML
    - Distributed programming
      - RPC and friends
  - 25% (or so) on lower layers of OSI model
    - TCP/UDP details (sockets)
    - IPv6

Programming

- ***Learn networking via network programming***.
  - Assignments involve programming.
    - Network interactions (of course)
    - Also error handling
    - Additional supporting topics as needed
  - C and Java required
    - Basic network APIs are C.
    - Java for easier development and distributed objects.
  - Use of C++ or Scala supported, *not required*.

Topics

- Topics from Network/Transport Layer & Up
  - TCP/UDP, IPv6
    - Understanding what the protocols are good for.
    - Understanding how the protocols work.
    - Using the network analyzer tool.
  - Application Protocols
    - SMTP, RFC-2822, MIME, etc
  - Data Exchange
    - Unicode
    - Introduction to XML, XML Schema, XSLT
  - Reading RFCs, W3C Recommendations, etc

Resources

- Class web site
  - http://web.vtc.edu/users/pcc09070/cis-3152
    - Slides
    - Homework assignments
    - Sample programs
    - Links to other resources
      - Documentation
      - Software
    - **One stop shopping for all course related information!**
- *Review course syllabus!*

First Assignments

- Homework #1 posted
  - You should have everything you need to do the assignment by the end of this week.
- Expect one assignment per week
  - … on the average
- Labs?
  - In the past this was a lab course. *It is no longer*.
  - BUT… we will look at some old labs as samples
    - Some assignments may be related

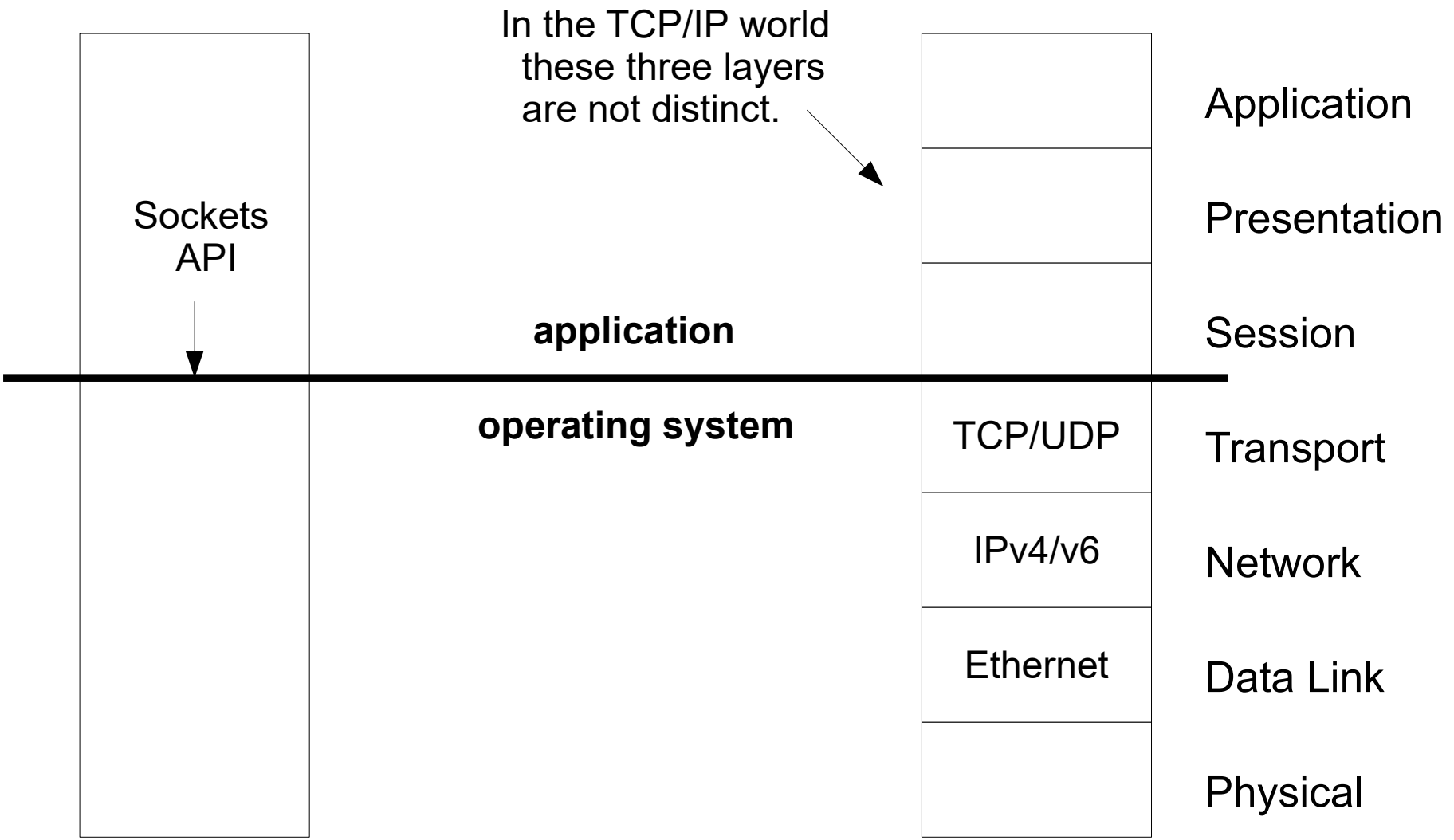
Contact Information

- Peter C. Chapin <pchapin@vtc.edu>
  - Email is the best way to contact me.
    - I will reply to student messages in one business day.
  - I will send information to a class distribution list.
    - List currently uses your official VTC address
      - Let me know if you want another address instead (or in addition)
    - Check your mail regularly.
  - Email questions encouraged
    - May send answers to class via email unless you explicitly ask otherwise.
- Skype for Business; IRC: pcc on FreeNode

First Topic

- Sockets API
  - The interface into the OS for network functionality
    - Standardized by POSIX in the Unix world.
    - Provided as a “compatibility layer” on Windows.
- WinSock?
  - Our programming will be in a Unix environment.

OSI Model


In the TCP/IP world these three layers are not distinct.
Sockets API
application
operating system
TCP/UDP
IPv4/v6
Ethernet
Application
Presentation
Session
Transport
Network
Data Link
Physical

Why Sockets?

- Low level entry into the OS
  - If it can be done at all, it can be done with the sockets API
  - … thus sockets are fundamental
- Other network features ultimately call sockets
  - ... regardless of programming language
  - ... regardless of library
- Straight C
  - For this part of the course we will be using plain C
    - No Java.

Good Luck

Have fun and enjoy CIS-3152!