

DE050 Computer Network and Security

H. Anthony Chan

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Part I: Introduction

Assignment: read chapter 1 in text

Our goal:

- ◆ get context, overview, "feel" of networking
- ◆ more depth, detail later in course
- ◆ approach:
 - descriptive
 - use Internet as example

Overview:

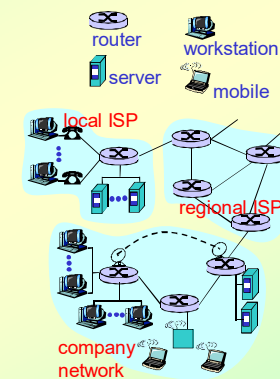
- ◆ What is the Internet?
- ◆ What's a protocol?
- ◆ Network structure, network edge
- ◆ Network core
- ◆ Access network
- ◆ LAN topology
- ◆ Physical media
- ◆ Internet structure and ISPs
- ◆ Performance: loss, delay
- ◆ Protocol layers, service models
- ◆ History

Communication Networks Overview

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What's the Internet: "nuts and bolts" view

- ◆ millions of connected computing devices:
 - hosts = end-systems**
 - pc's workstations, servers
 - PDA's phones, toasters
- running **network apps**
- ◆ **communication links**
 - fiber, copper, radio, satellite
 - transmission rate = **bandwidth**
- ◆ **routers**: forward packets (chunks of data) thru network



“Cool” internet appliances



IP picture frame
<http://www.ceiva.com/>



World's smallest web server
<http://www-ccs.cs.umass.edu/~shri/iPic.html>



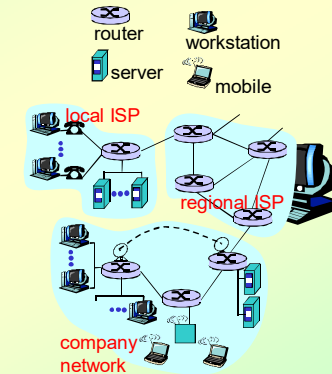
Web-enabled toaster+weather forecaster
<http://dancing-man.com/robin/toasty/>

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Modern Society will find no solution to the ecological problem unless it takes a serious look at its lifestyles. (Pope John Paul II)

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What's the Internet: “nuts and bolts” view

- ♦ **protocols**: control sending, receiving of msgs
 - e.g., TCP, IP, HTTP, FTP, SSH, PPP
- ♦ **Internet**: “network of networks”
 - loosely hierarchical
 - public Internet versus private intranet
- ♦ Internet standards
 - RFC: Request for comments
 - IETF: Internet Engineering Task Force

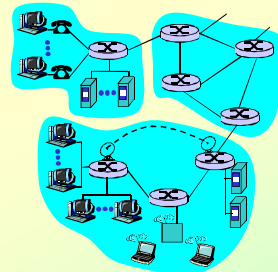


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What's the Internet: a service view

- ♦ **communication infrastructure** enables distributed applications:
 - WWW, email, games, e-commerce, file (MP3) sharing, database, voting.
- ♦ **communication services provided to applications**:
 - Connectionless: unreliable
 - connection-oriented: reliable



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What's a protocol?

human protocols:

- ♦ "what's the time?"
- ♦ "I have a question"
- ♦ introductions

... specific msgs sent

... specific actions taken when msgs received, or other events

network protocols:

- ♦ machines rather than humans
- ♦ all communication activity in Internet governed by protocols

protocols define format, order of msgs sent and received among network entities, and actions taken on msg transmission, receipt

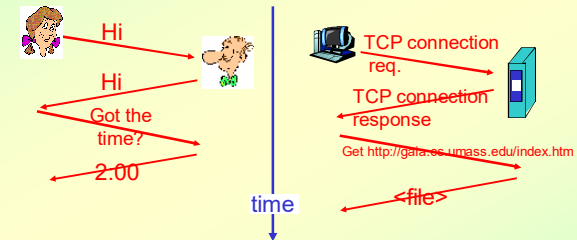
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What's a protocol?

a human protocol and a computer network protocol:



Q: Other human protocol?

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