

cis3.2 — electronic commerce — 9 sep 2005 — lecture # 4

today

topics:

- the internet
- internet addressess
- domain names
- clients and servers
- ports and sockets

reading:

- today: Ince chapter 2 (sections 3.3 through 3.7; note that we are skipping section 4)
- for next week: Ince chapter 3

the internet

- history of the internet
 - ARPAnet (circa 1971): used “NCP”
 - TCP (1974): hardware independent, open
 - internet was standardized in September 1981
- structure

– internet layers:	telnet FTP user applications	SNMP TFTP user applications	<i>OSI model</i> <i>upper</i> <i>layers</i>
	TCP	UDP	<i>lower</i>
	IP	ICMP	<i>layers</i>

- telnet: lets users log on remotely
- FTP: file transfer protocol
- SNMP: simple network management protocol (monitors network for problems)
- TFTP: trivial file transfer protocol (fast file xfer, lacks security)
- other example (user) applications:
 - * SMTP: simple mail transfer protocol (transfers mail msgs from one computer to another)
 - * kerberos: security protocol (allows transfer of highly confidential data)
 - * DNS: domain name system (enables symbolic instead of numeric host naming)
 - * NFS: network file system (allows sharing of files between computers)
- TCP: can re-transmit if errors
- UDP: no error checking, fast messaging
- IP: i.e., moving data via TCP or UDP
- ICMP = internet control message protocol (checks status of computers with other network devices)

internet addresses

- *IP address* = Internet Protocol address
- every computer on the internet has a unique address
- *dotted quad notation* = four numbers separated by dots (.); e.g., 146.245.250.131 (which is the address of the CIS dept web server...)
- address can be stored in 32 bits; there are four formats, depending on the size of the network (i.e., the size of each of the numbers in the dotted quad notation is defined by the format...)
- “subnetting” is a standard (defined in 1985) to divide a large network into a number of smaller networks (this is what a *router* does)

- example:
IP address 130.5.5.25 $\rightarrow$

network prefix	subnet number	host number
130.5.	.5	.25

domain names

- provides a more convenient way to address a computer on the internet than the numeric IP address
- structured hierarchically (see tree structure figure 2.7)
- example: `www.sci.brooklyn.cuny.edu`
- common *domain names*: `com`, `edu`, `gov`, `uk` and other country-based domains
- *name server*: maintains correspondance between numeric IP address and domain names;
- DNS = internet domain name system = group of domain name servers

clients and servers

- *server*: computer on a network which carries out some service for another computer
- *server*: the other computer for whom the server is carrying out the service...
- types of servers: domain name server, web server, email server, game server, etc.

ports and sockets

- *port*
 - network conduit on a computer through which a connection to/from other computers is made
 - certain numbers are commonly associated with certain services (see table 2.2); e.g., port 80 $\rightarrow$ http
 - allows two-way communication
 - NOT a hardware concept (NOT like “USB port” or “printer port”)
 - users can define their own network ports and use them for user-specific applications
- *socket*:
 - a network connection implemented in software
 - i.e., a program has to open a “socket” on a computer (using an IP address and a port number) to reach another program on another computer