Lecture: 4

CSE 303

Protocols

- In computer networks, communication occurs between entities in different systems. An entity is anything capable of sending or receiving information.
- Two entities cannot simply send bit streams to each other and expect to be understood. For communication to occur, the entities must agree on a protocol.
- A protocol is a set of rules that govern data communications.

- A protocol defines what is communicated, how it is communicated, and when it is communicated.

Syntax

- The term *syntax refers to the structure or format of the data, meaning the* order in which they are presented.
- For example, a simple protocol might expect the first 8 bits of data to be the address of the sender, the second 8 bits to be the address of the receiver, and the rest of the stream to be the message itself.

Semantics

- The word *semantics refers to the meaning of each section of bits.*
- How is a particular pattern to be interpreted, and what action is to be taken based on that interpretation? For example, does an address identify the route to be taken or the final destination of the message?

Timing

- The term *timing refers to two characteristics:*
- *when data should be sent*
- how fast they can be sent
- For example, if a sender produces data at 100 Mbps but the receiver can process data at only 1 Mbps, the transmission will overload the receiver and some data will be lost.

Standards

- Standards are essential in creating and maintaining an open and competitive market for equipment manufacturers and in guaranteeing national and international interoperability of data and telecommunications technology and processes.

- Data communication standards fall into two categories: *de facto (meaning* "by fact" or "by convention") and *de jure (meaning "by law" or "by regulation").*

De facto

- Standards that have not been approved by an organized body but have been adopted as standards through widespread use are de facto standards. De facto standards are often established originally by manufacturers who seek to define the functionality of a new product or technology.

De jure

- Those standards that have been legislated by an officially recognized body are de jure standards.

- The driver's seat side in a given country starts as a user/industry preference, turning to a local tradition, then a traffic code local norm.

- The QWERTY system was one of several options for the layout of letters on typewriter (and later keyboard) keys. It was developed to prevent adjacent keys from jamming on early and later mechanical typewriters, often attributed to the typist's speed. It became a *de facto* standard because it was used on the most commercially successful early typewriters.

- HTML (computer file format) started as "*de facto*" (1993-1995) and became the "*de jure*" standard (1995–present day).

- The ASCII text character set, standardized in 1963 is still in use. Document files containing ASCII have the TXT extension.

- The MP3 audio format started as an alternative to CD WAV for Internet music distribution, then replaced it — it is now supported by the vast majority of music players, audio transport, audio storage and non-commercial media. WAV and MP3 are also "*de jure* ISO formats".

- HTML (computer file format) started as "*de facto*" (1993-1995) and became the "*de jure*" standard (1995–present day).

The personal computer began to be manufactured in the early 1980s.

Various companies started to produce and sell their own version of the PC. However, they were developed with only their own equipment in mind. No thought was given for other companies to be able to add their own hardware.

This meant that only their own printers, monitors, hard drives etc could be used with their particular system. They also had their own operating systems such as CP/M.

There were no standards!

IBM had a different mind set. They developed a personal computer that was designed specifically to encourage other vendors to make additional hardware such as expansion cards for the IBM PC.

IBM then told other manufacturers how to make their equipment compatible with the IBM PC.

IBM effectively created the **'de-facto' standard** for the personal computer industry.

A 'de-facto' standard is one created almost by default because of one dominant player in that industry. There is no formal outside organisation that approved or signed off the standard.

Assignment 1

- Each group should Make a report on one particular De facto standards and submit the hard copy by 1st of June 2014.

Lecture 6

- Next class: OSI model…