Basic Internet programming – Formalities

'Hands-on' tools for internet programming

DD1335 (gruint10)

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- Providing tools for hands-on internet programming

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- There are only 9 lectures – do show up, please!

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- Other Issues
  - XML, Web Services, Semantic Web
  - PHP and other scripting languages

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References:

- Harold: Java Network Programming
- Hall: Core Web Programming
- Deitel, et al: Internet and the World Wide Web How to Program
- Ince: Developing Distributed and E-Commerce Applications

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- There is support in the networks, where we will look closer on the internet.

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- Kinds of application programs
  - E-mail
  - News
  - Web based databases
  - Client-server, per-to-peer
  - Telephone
  - Video
  - ...

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- *protocol*, rules, specifying how to perform communication

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- 1986 there were 5000 computers
- 1987 – 28000,
- 1989 – 100000,
- 1990 – 300000,
- 2009 – 1.67 billion (a rough estimate on June 30)

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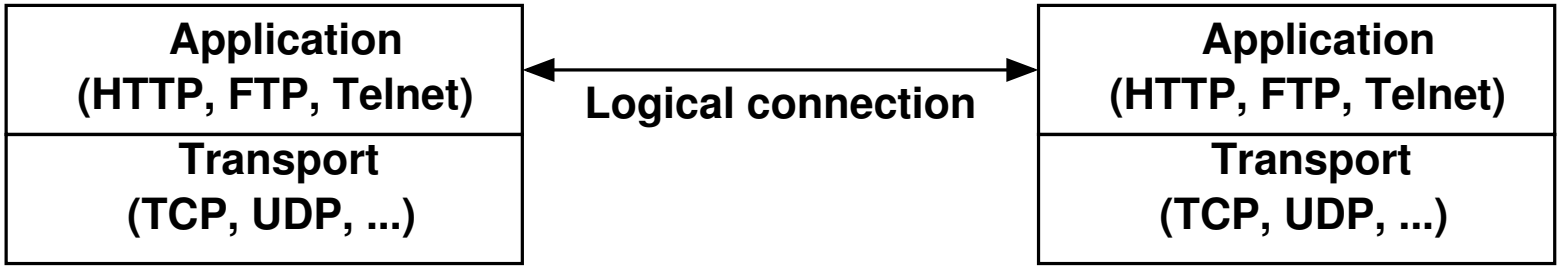

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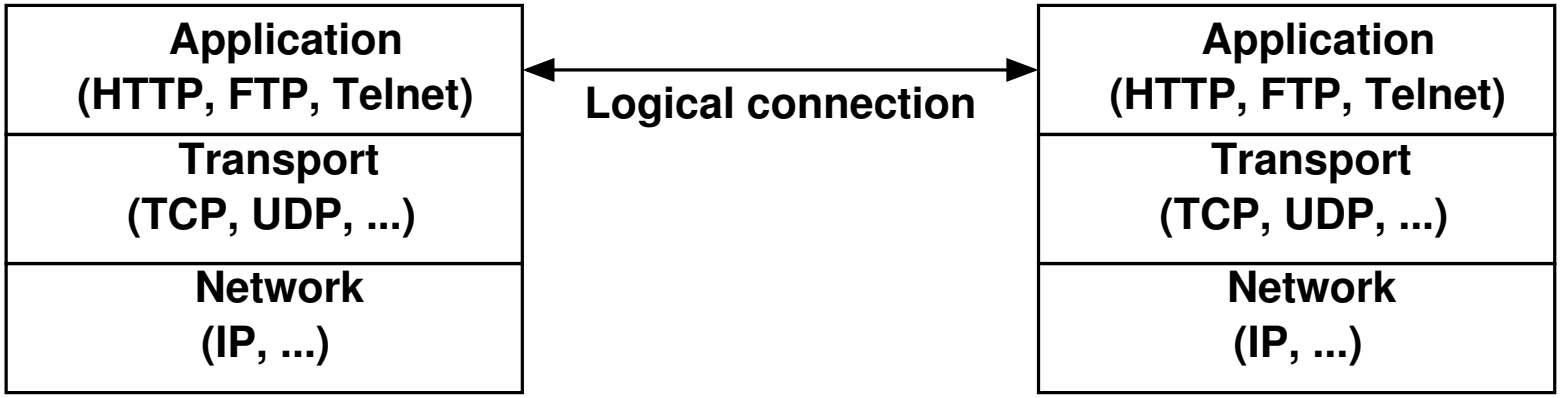

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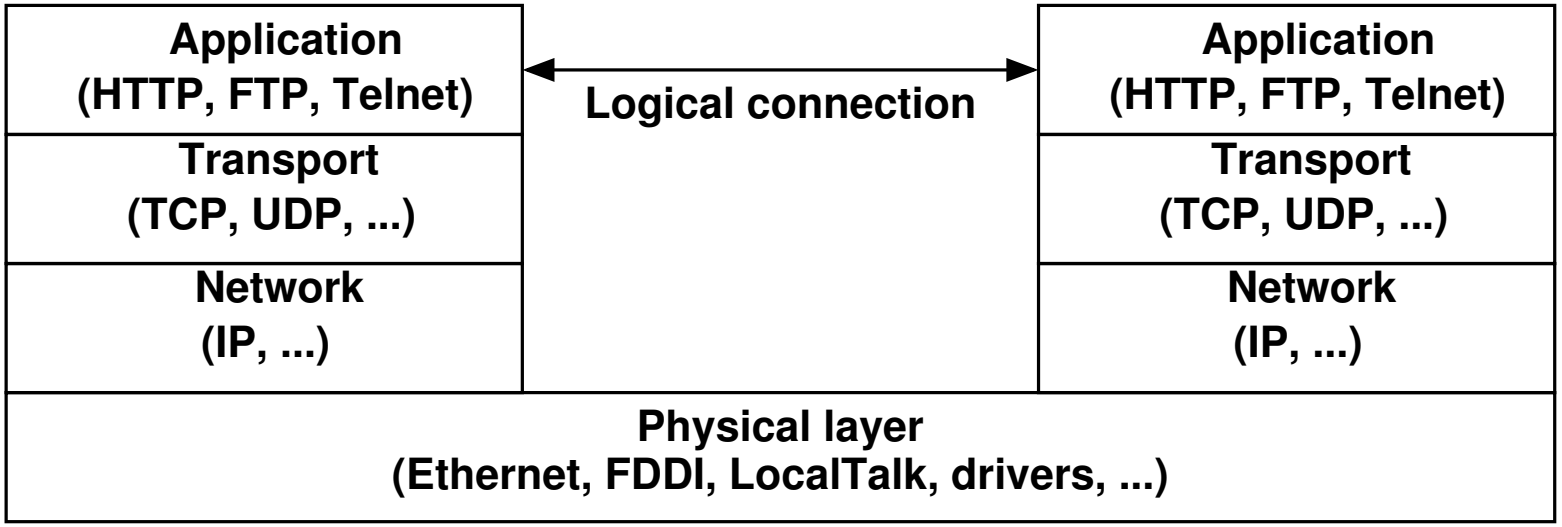

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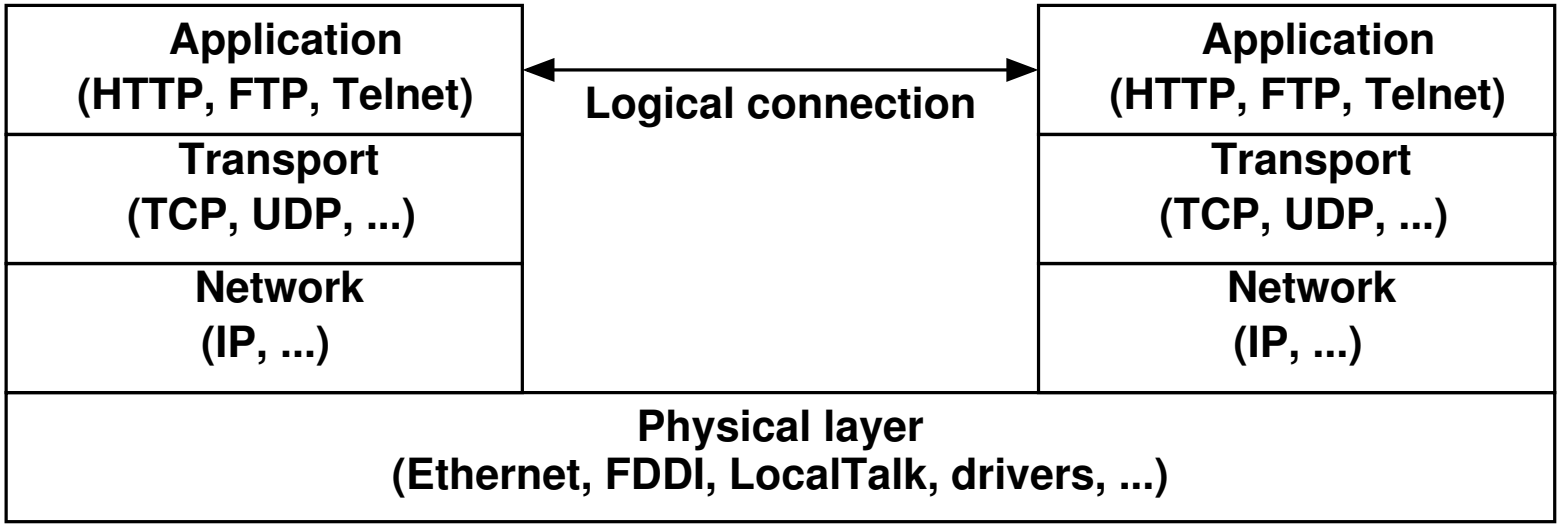

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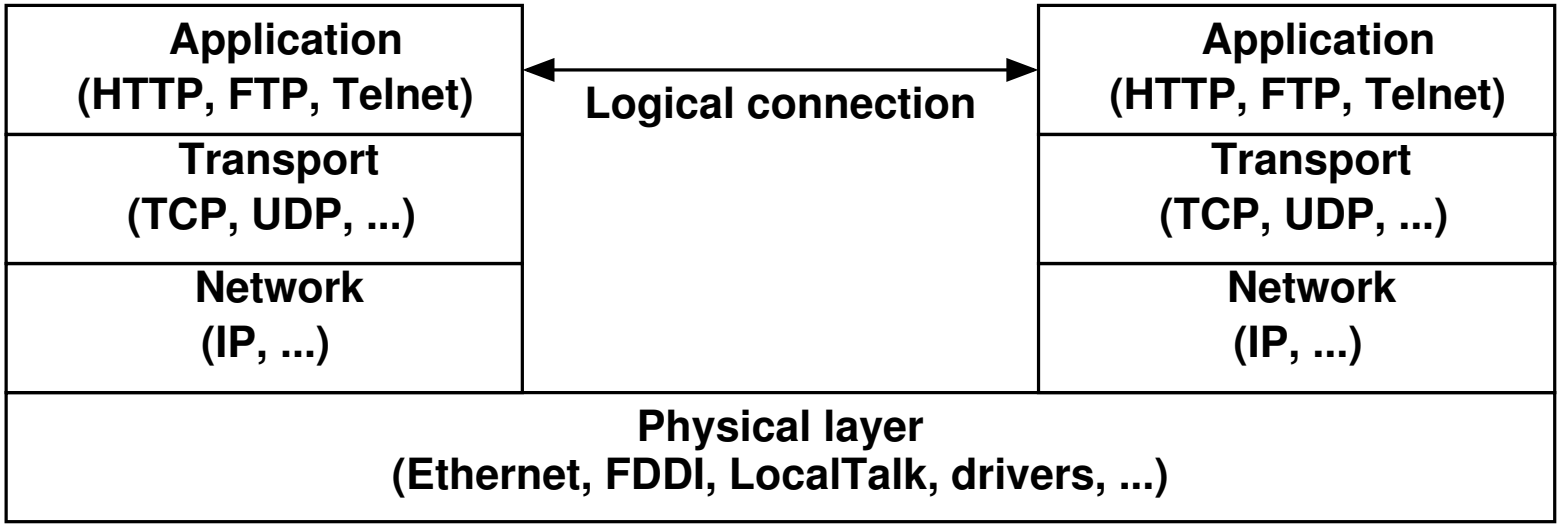

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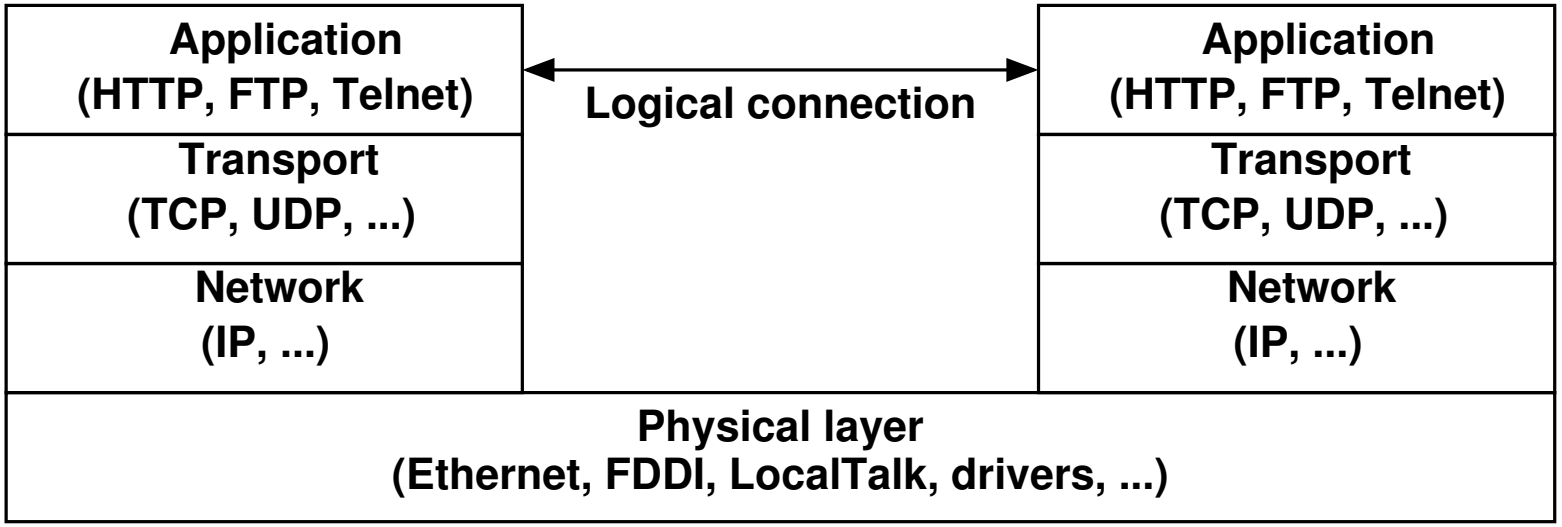

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- Other layers are normally of no concern

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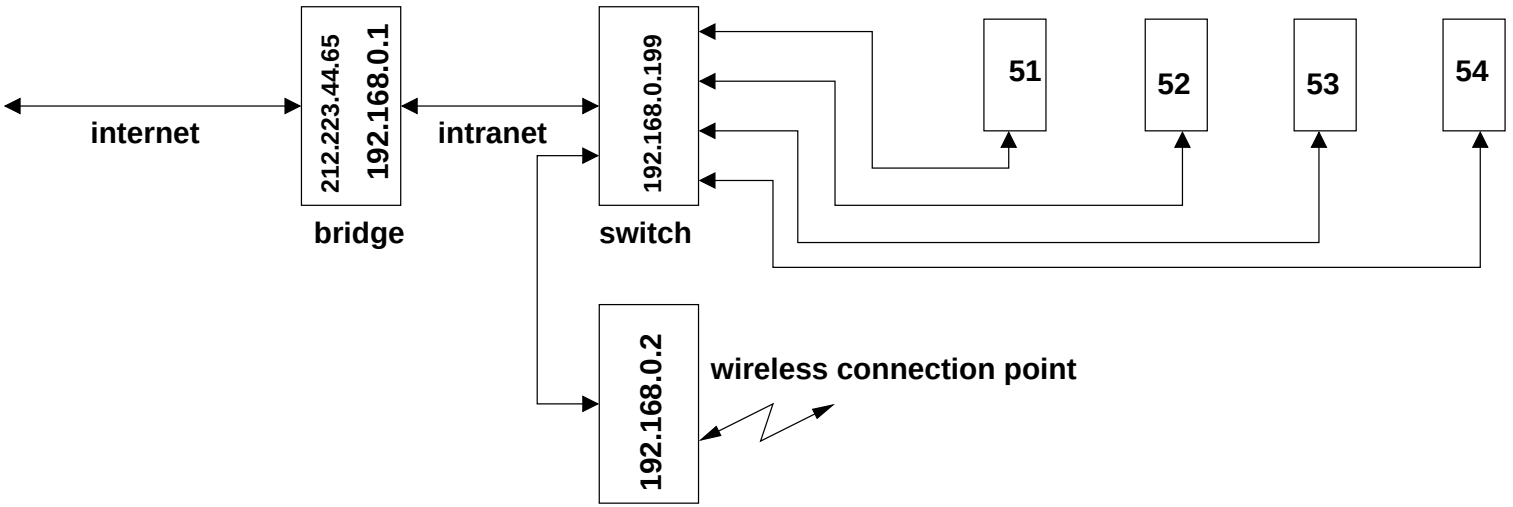
- *DNS*, Domain Name Server
  - IP-addresses are hard to remember and thus DNS was created to allow symbolic (textuel) names that are looked up and translated to IP-addresses
  - Eg.: `www.nada.kth.se` is translated to `130.237.225.40`

Ports

- Every computer with an IP-address has 65536 logical ports for communication over the internet.
- Some are reserved
  - ports number 0-1023 are reserved (for what and by whome may be seen in the file `/etc/services` (on UNIX/Linux)
  - eg. the following:
    - port 7 for echo
    - port 20-21 for ftp
    - port 23 for telnet
    - port 25 for smtp (send e-mail)
    - port 80 for http (web server)
    - port 110 for POP3 (read e-mail)

Intranet

There are other networks with the same structure. Local networks are usually called *intranet*. They may link to the internet with special ”bridges”. Sometimes the bridge uses filtering devices to restrict the data traffic between the networks.



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  - a client asks a server for a service (as eg. information about the time)
  - a server accomplishes the corresponding task and delivers the service (like sending time info, sending a file from its local file system, eg. a web page)
  - both following a protocol that enables asking for and providing services over the network

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  Eg:
  - a shared editor
  - a game (runescape, world of warcraft, . . .)
  - a telephone connection

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  - Informative, that may have been constructed outside the RFC but still are useful without delivering an established protocol

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  - an open standard that determines how multimedia objects are to be transmitted by e-mail

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  - looks like: `protocol://host[:port]/path/file[#section]`
  - eg:

    `http://www.csc.kth.se:8080/dd1335/gruint09/labs/#lab2`
- URN, Universal Resource Name

URL, URI, URN

- URI, Uniform Resource Identifier
  - define how to uniquely identify a resource on the internet
  - is divided into the subgroups URL and URN
- URL, Uniform Resource Locator
  - a reference for an address on the internet
  - looks like: `protocol://host[:port]/path/file[#section]`
  - eg:

    `http://www.csc.kth.se:8080/dd1335/gruint09/labs/#lab2`
- URN, Universal Resource Name
  - a ”pointer” to a resource without specifying its exact position, eg. the search for a certain kind of documents may deliver the set of URLs (the positions of all the documents)

SGML & HTML

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- HTML, HyperText Markup Language
  - Was created from SGML early in the 1990s
  - Describes how to present a text rather than its semantics
  - Is ”lingua franca” for presentation of hypertext on the web

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  - the web server responds by sending the file `index.html` to the client

MIME

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  - an open standard for how to send multimedia objects by e-mail
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  - an open standard for how to send multimedia objects by e-mail
  - denotes the type of data that is transmitted, eg.
    - text/plain, text/html
    - news
    - application/postscript, application/pdf
    - zip
    - image/gif, image/jpeg, image/tiff, image/x-bitmap
    - audio/basic, audio/mpeg
    - video/mpeg, video/quicktime, video/x-msvideo