Fundamental Network Topics

*You can do most of the exercises in this document by yourself, but they are meant as exercises with a supplementary discussion in the class, so you will gain a lot more from participating in the class.*

### Understanding Basic Network Terms like IP, TCP/IP, DNS, DHCP and more.

Most of these exercises are meant to be answered with text, so write down your reply so you will remember.

* What is your public IP address right now, and how did you find it?
  + 5.179.80.204 (<http://myip.dk>)
* What is your private IP address right now (do this both at home and in school), and who/what gave you that address?
  + 10.50.138.166 (School)
  + 192.168.0.188 (Home)
* What’s special about these address ranges?
* 10.0.0.0 – 10.255.255.255
* 172.16.0.0 – 172.31.255.255
* 192.168.0.0 – 192.168.255.255
  + Reserved for privat networking not routed through the internet
* What’s special about this ip-address: 127.0.0.1?
  + Localhost
* What kind of service would you expect to find on a server using these ports: 22, 23, 25, 53, 80, 443?
  + 22 – SSH remote login protocol
  + 23 - Telnet
  + 25 – Simple Mail Transfer Protocol (SMTP)
  + 53 – Domain Name System (DNS)
  + 80 - HTTP
  + 443 - HTTPS
* What is the IP address of studypoints.dk and how did you find it?
  + 157.230.21.145 (nslookup studypoints.info)
* If you write https://studypoints.dk in your browser, how did “it” figure out that it should go to the IP address you discovered above?
  + It asks the DNS server
* Explain shortly the purpose of an ip-address and a port-number and why we need both
  + The ip-address directs to the server and the port directs to a specific application on the server
* What is your (nearest) DNS server,?
  + Local on my desktop
* What is (conceptually) the DNS system and the purpose with a DNS Server?
  + The DNS link an easy to read domain name to an ip-address
* What is your current Gateway, and how did you find it?
  + 10.50.128.1 (netstart -nr | grep default)
* What is the address of your current DHCP-Server, and how did you find it?
  + 10.255.1.10 (ifconfig -a) (ipconfig getpacket en0) hvor en0 kan variere
* Explain (conceptually) about the TCP/IP-protocol stack
  + The transport layer uses TCP to devide data to segments and sends the segments to internet layer. Internet layer uses IP and devides the segments from transport layer to data packages and sends them to Datalink layer
* Explain about the HTTP Protocol (the following exercises will go much deeper into this protocol)
  + HTTP is an application protocol for distributed, collaborative, hypermedia information systems. HTTP functions as a request-response protocol in the client-server computing model. A web browser for example, may be the client and the application running on a computer hosting a website may be the server. The client submits an HTTP request message to the server. The server, which provides resources such as HTML files and other content, or performs other functions on behalf of the client, returns a response message to the client. The response contains completion status information about the request and may also contain requested content in its message body.
* Explain (conceptually) how HTTP and TCP/IP are connected (what can HTTP do, and where does it fit into TCP/IP)
  + Data coded according to application layer protocols are encapsulated into transport layer protocol units such as TCP, which in turn use lower layer protocols to effect actual data transfer.