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
* What is your private IP address right now (do this both at home and in school), and who/what gave you that address?
  + 10.50.138.170 - The Router
* 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
  + They are reserved for private networking - not routed through the internet
* What’s special about this ip-address: 127.0.0.1?
  + It’s the local ip
* 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
* 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?
  + By asking a 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,?
  + On my computer locally but not in Linux sooooo idk
* What is (conceptually) the DNS system and the purpose with a DNS Server?
  + The DNS is a link from easy to read domain names to ip addresses
* What is your current Gateway, and how did you find it?
  + 10.50.128.1 - netstat -rn
* What is the address of your current DHCP-Server, and how did you find it?
  + 10.255.1.10 - sudo grep -R "DHCPOFFER" /var/log/\*
* Explain (conceptually) about the TCP/IP-protocol stack
  + TCP provides reliable, ordered, and error-checked delivery of a stream of bytes between applications running on servers communicating via an IP network.
* Explain about the HTTP Protocol (the following exercises will go much deeper into this protocol)
  + HTTP functions as a request-response protocol, a browser can send a HTTP request to a server and the server will send a HTTP response back to the client with a header and a body. The header includes where to send the information to and the body contains the information like HTML.
* Explain (conceptually) how HTTP and TCP/IP are connected (what can HTTP do, and where does it fit into TCP/IP)
  + An HTTP client initiates a request by establishing a TCP connection to a particularport on a server. The port by default for a website is 80.