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?

My public IP is: 5.179.80.205

Jeg kan for eksempel gå ind på Ip4.me og se hvad min public IP er.

Min public IP bliver givet af en af de fem RIRS regioner, som udstedt af IANA.

* What is your private IP address right now (do this both at home and in school), and who/what gave you that address?

My private IP is 10.50.128.1

Din private ip adresse er kun for dig, dit netværk og din router. Din private IP bliver givet af routeren.

* 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

Dette er reserverede private ipv4 adresse intervaller som er reserveret til privat ip brug. Dette bliver brugt af bl.a. af routere og industrielle maskiner.

* What’s special about this ip-address: 127.0.0.1?

Dette er Localhost IP-adresse.

* 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

(For mac)

Network utility 🡪 traceroute 🡪 studypoints.info.

(Alternativly)

A screenshot of a cell phone

Description automatically generated

* 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?

Når jeg taster en URL-adresse så checker browseren den lokale DNS cache om vi har den adresse. Har vi den ikke lokalt så rækker den ud efter den nærmeste DNS server, og requester adressen, har den DNS server det ikke, rækker denne DNS server ud efter sin nærmeste og checker, har den DNS server adressen så senden den den tilbage hele vejen igennem de andre DNS server til din computer, og cacher den på de andre DNS Servere.

* Explain shortly the purpose of an ip-address and a port-number and why we need both

En IP-adresse er ligesom vores fysiske adresse i en lejlighed, den fortæller hvor den information skal hen, som vi har anmodet om. Hvor porten fortæller om hvor i lejligheden informationen skal hen, hvilken etage/værelse.

* What is your (nearest) DNS server?

Det er den lokale cache man har.

* What is (conceptually) the DNS system and the purpose with a DNS Server?

DNS-systemet cacher URLer og deres respektive IP adresser. Denne cache bliver slettet løbende og derfor skal man have flere DNS servere som kan kontakte hinanden og deres cache.

* What is your current Gateway, and how did you find it?

10.50.128.1

(Mac)

System Preferencer 🡪 Netværk 🡪 advanceret 🡪 TCP/IP 🡪 router : 10.50.128.1

Terminal

A screenshot of a cell phone

Description automatically generated

* What is the address of your current DHCP-Server, and how did you find it?

(mac)

ipconfig getpacket en1

10.255.1.9

* Explain (conceptually) about the TCP/IP-protocol stack

TCP/IP-protokollen er den mest brugte protokol. Denne protokol lader computere kommunikere på trods for mange diverse forskellige hardware og software, som også er på forskellige netværk.

* Explain about the HTTP Protocol (the following exercises will go much deeper into this protocol)

HTTP protokollen er den måde en browser kommunikere med en server. Her bliver der sendt et HTTP request til serveren, og serveren sender så et HTTP response tilbage som browseren pakker ud.

* Explain (conceptually) how HTTP and TCP/IP are connected (what can HTTP do, and where does it fit into TCP/IP)

HTTP protokollen beder en server på TCP-port 80 (med mindre der er blevet angivet andet), om specifikke resourcer. Serveren sender så et http response tilbage.