

# **Tverrfaglig oppgave vinteren 2021/2022**

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# Planlegging

## Tjenester

- Apache
- PHP
- UFW

## Navnstandard

Server – srv + OS + ID

Desktop – DESK + ID

Laptop – LAP + ID

Ubuntu - ubnt

## Utstyr

1 Router

2 Klienter

1 Server

1 Switch

5 Nettverkskabler

1 Minnepinne med Ubuntu

## Bruker

Tre første bokstavene i fornavnet og etternavnet + ID

Fornavn Etternavn nr. 1 = forett01

## Passord

- 8 tegn
- Minst 1 stor og en liten bokstav
- Minst 1 tall

## IP plan

ETH0

Gruppe	Subnet mask	Gateway	DHCP-scope/Statisk	DNS
--------	-------------	---------	--------------------	-----

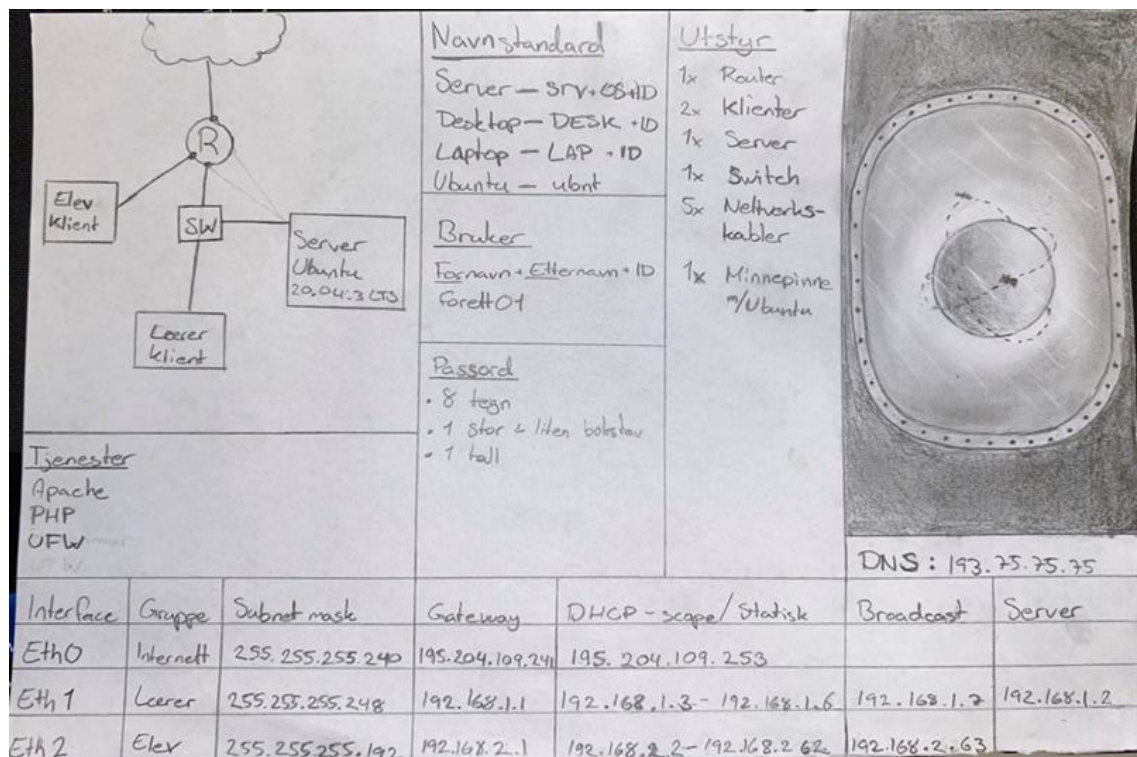
Internett	255.255.255.240	195.204.109.241	195.204.109.253	193.75.75.75

## ETH1

Gruppe	Subnet mask	Gateway	DHCP-scope/Statisk	Broadcast	Server
Lærer	255.255.255.248	192.168.1.1	192.168.1.3 - 192.168.1.6	192.168.1.7	192.168.1.2

## ETH2

Gruppe	Subnet mask	Gateway	DHCP-scope/Statisk	Broadcast
Elev	255.255.255.192	192.168.2.1	192.168.2.2 - 192.168.2.62	192.168.2.63



## Driftstøtte

## Nettverk

## Konfigurasjon

Eth0 har fått IP-adresse 195.204.109.253

Eth1 har fått IP-adresse 192.168.1.1 og er for lærere, og server har fått statisk IP her

Eth2 har fått IP-adresse 192.168.2.1 og er for elever

Wizards > Basic Setup

Her setter vi opp internettilkobling.

The screenshot shows the 'Basic Setup' wizard in a network configuration interface. The left sidebar lists 'Setup Wizards' with 'Basic Setup' selected, and 'Feature Wizards' with options like 'DNS host names', 'TCP MSS clamping', 'JPNP', and 'IPN status'. The main panel is titled 'Use this wizard to set up basic Internet connectivity and to customize local network settings'. It features a section for 'Internet port (eth0 or eth3/SFP)' with instructions to connect to an Internet connection. The 'Port' is set to 'eth0'. Under 'Internet connection type', 'Static IP' is selected. A section titled 'Static network settings provided by the Internet Service Provider' contains three input fields: 'Address' (195.204.109.254 / 255.255.255.240), 'Gateway' (195.204.109.241), and 'DNS server' (193.75.75.75). Below this, 'PPPoE' is an unselected option. Further down, there are checkboxes for 'VLAN' (Internet connection is on VLAN), 'IPv4 Firewall' (Enable the default firewall), 'IPv6 Firewall' (Enable the default IPv6 firewall), and 'DHCPv6 PD' (Enable DHCPv6 Prefix Delegation). A 'DNS forwarding' section at the bottom prompts the user to select how DNS requests will be resolved.

Setup Wizards

Basic Setup

Load Balancing

Load Balancing2

NAN+2LAN

NAN+2LAN2

Feature Wizards +

DNS host names

TCP MSS clamping

JPNP

IPN status

Use this wizard to set up basic Internet connectivity and to customize local network settings

▼ Internet port (eth0 or eth3/SFP)

Connect eth0 or eth3/SFP to your Internet connection, for example, the cable modem or DSL modem, and select the connection type.

Port

Internet connection type

☐ DHCP

☒ Static IP

Static network settings provided by the Internet Service Provider

Address  /

Gateway

DNS server

☐ PPPoE

VLAN ☐ Internet connection is on VLAN

IPv4 Firewall ☐ Enable the default firewall

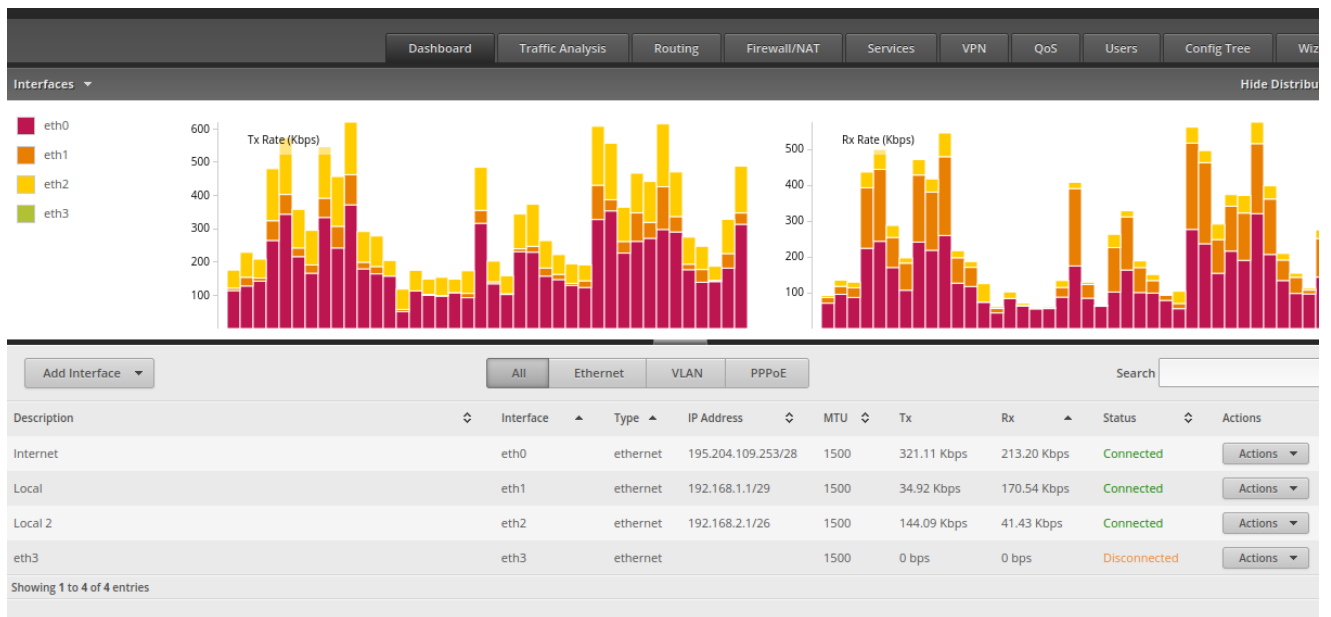
IPv6 Firewall ☐ Enable the default IPv6 firewall

DHCPv6 PD ☐ Enable DHCPv6 Prefix Delegation

▼ DNS forwarding

Select how DNS requests from devices on the local network will be resolved.

Oversikt



## Service > DHCP Server

Her kan man se de konfigurasjonene vi har laget til elev og lærer nettet:

Welcome ubnt ▾ to EdgeRouter-4 Dashboard Traffic Analysis Routing Firewall/NAT Services VPN QoS Users Config Tree WIZ

DHCP Server DNS PPPoE

+ Add DHCP Server Search

Name	Subnet	Pool size	Leased	Available	Static	Actions
Elev	192.168.2.0/26	61	1	60	0	Actions ▾
Lærer	192.168.1.0/29	4	2	2	1	Actions ▾

### DHCP Server - Elev

Leases Static MAC/IP Mapping Details

Pool Size: 61 Leased: 1 Available: 60 Static: 0

Subnet: 192.168.2.0/26  
Range Start: 192.168.2.2  
Range End: 192.168.2.62  
Unifi Controller:

Router: 192.168.2.1  
DNS 1: 192.168.2.1  
DNS 2: 1.1.1.1  
Status: Enabled

DHCP Name: Elev  
Subnet: 192.168.2.0/26  
Range Start: 192.168.2.2  
Range Stop: 192.168.2.62  
Router: 192.168.2.1  
Unifi Controller:

DNS 1: 192.168.2.1  
DNS 2: 1.1.1.1  
Domain:  
Lease Time: 86400 seconds  
Enable: ☒

### DHCP Server - Lærer

Leases Static MAC/IP Mapping Details

Pool Size: 4 Leased: 2 Available: 2 Static: 1

Subnet: 192.168.1.0/29  
Range Start: 192.168.1.2  
Range End: 192.168.1.6  
Unifi Controller:

Router: 192.168.1.1  
DNS 1: 192.168.1.1  
DNS 2: 1.1.1.1  
Status: Enabled

DHCP Name: Lærer  
Subnet: 192.168.1.0/29  
Range Start: 192.168.1.2  
Range Stop: 192.168.1.6  
Router: 192.168.1.1  
Unifi Controller:

DNS 1: 192.168.1.1  
DNS 2: 1.1.1.1  
Domain:  
Lease Time: 86400 seconds  
Enable: ☒

På lærernettet har serveren fått statisk IP-adresse:

DHCP Server - Lærer

Leases   Static MAC/IP Mapping   Details

Pool Size:	Leased:	Available:	Static:
4	2	2	1

Subnet: **192.168.1.0/29**  
Range Start: **192.168.1.2**  
Range End: **192.168.1.6**  
Unifi Controller:

Router: **192.168.1.1**  
DNS 1: **192.168.1.1**  
DNS 2: **1.1.1.1**  
Status: **Enabled**

Create New Mapping

Search

Name ^	MAC Address ^	IP Address ^	Actions
srvubnt01	f0:de:f1:6a:d6:3a	192.168.1.2	

Showing 1 to 1 of 1 entries

Delete

```

After this operation, 860 kB of additional disk space will be used.
Get:1 http://no.archive.ubuntu.com/ubuntu impish/main amd64 net-tools amd64 1.60+git20181103.0eebece-1ubuntu2 [193 kB]
Fetched 193 kB in 0s (2 072 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 161294 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20181103.0eebece-1ubuntu2_amd64.deb ...
Unpacking net-tools (1.60+git20181103.0eebece-1ubuntu2) ...
Setting up net-tools (1.60+git20181103.0eebece-1ubuntu2) ...
Processing triggers for man-db (2.9.4-2) ...
srvubnt01@srvubnt01:~$ ifconfig
enp0s25: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.2 netmask 255.255.255.248 broadcast 192.168.1.7
    inet6 fe80::f154:5841:21ec:3b01 prefixlen 64 scopeid 0x20<link>
    ether f0:de:f1:6a:d6:3a txqueuelen 1000 (Ethernet)
    RX packets 272370 bytes 411952064 (411.9 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 102835 bytes 8068024 (8.0 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
    device interrupt 20 memory 0xf1600000-f1620000

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 15082 bytes 1107929 (1.1 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 15082 bytes 1107929 (1.1 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp3s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 00:24:d7:ba:ab:fc txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
  
```

Lærer klient:

```
C:\Windows\system32\cmd.exe

Wireless LAN adapter Lokal tilkobling* 1:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet:

Connection-specific DNS Suffix  . :
Link-local IPv6 Address . . . . . : fe80::bdee:3007:f769:edd6%4
IPv4 Address. . . . . : 192.168.1.3
Subnet Mask . . . . . : 255.255.255.248
Default Gateway . . . . . : 192.168.1.1

Wireless LAN adapter Wi-Fi:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . : home.net

Ethernet adapter Bluetooth-nettverkstilkobling:

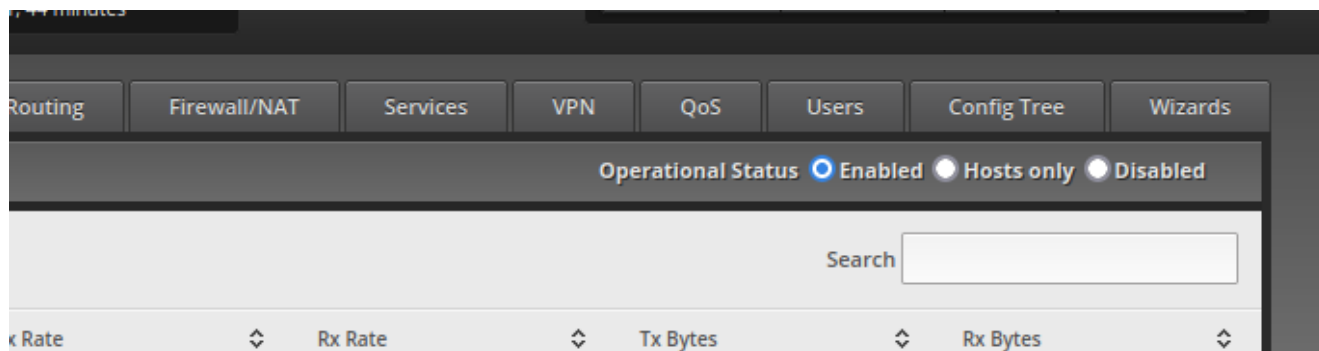
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :

Tunnel adapter Lokal tilkobling* 11:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix  . :

C:\Users\Skoie>
```

Ekstrabit: Blokkér Sosiale Medier og Spill på Elevnettet  
Traffic Analysis > Operational Status > Enabled



Firewall/NAT > Firewall Policies

Blokker sosiale medier og noen spill.



Port Forwarding

Firewall Policies

NAT

Firewall/NAT Groups

+ Add Ruleset

Name	Interfaces
BLOCK_SOSIAL	eth2/in
BLOCK_TO_ROUTER	eth0/in

Showing 1 to 2 of 2 entries

Interfaces	Number of Rules	Default Action
eth2/in	2	accept
eth0/in	1	accept

Ruleset Configuration for BLOCK\_SOSIAL

Rules

Configuration

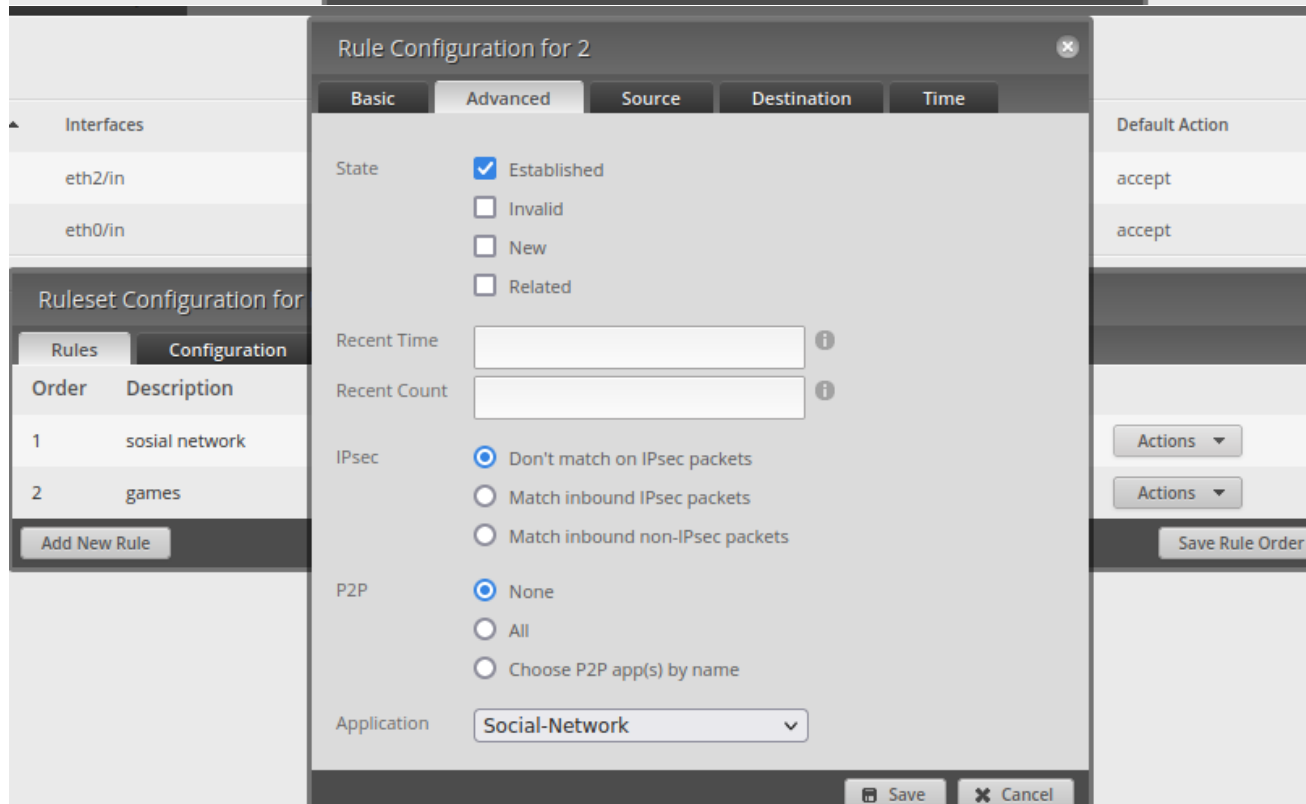
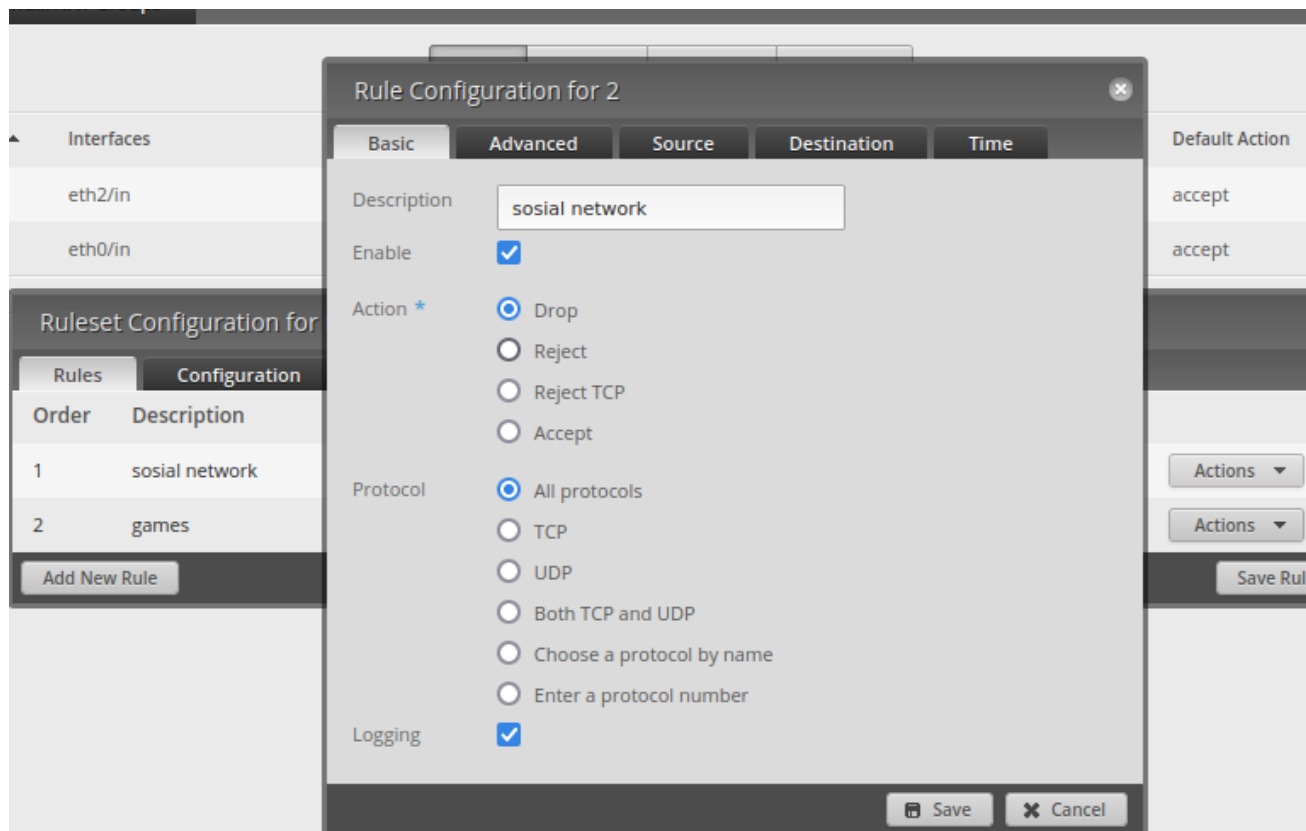
Interfaces

Stats

Order	Description	Source	Destination	Protocol	Action
1	social network			all	drop
2	games			all	drop

Add New Rule

Save Rule Order



eth2/in 2 accept

Ruleset Configuration for BLOCK\_SOSIAL

Rules Configuration Interfaces Stats

Name **BLOCK\_SOSIAL**  
Description   
Default Action \* ☐ Drop ☐ Reject ☒ Accept  
Default Log ☐

Save Ruleset

“DPI. Dyp pakkeinspeksjon er en type databehandling som i detalj inspiserer dataene som sendes over et datanettverk, og kan iverksette tiltak som å varsle, blokkere, omdirigere eller logge dem deretter.” - [Wikipedia](#)

eth0/in 1 accept

Ruleset Configuration for BLOCK\_SOSIAL

Rules Configuration Interfaces Stats

Interface \*  Direction \*

Save Ruleset

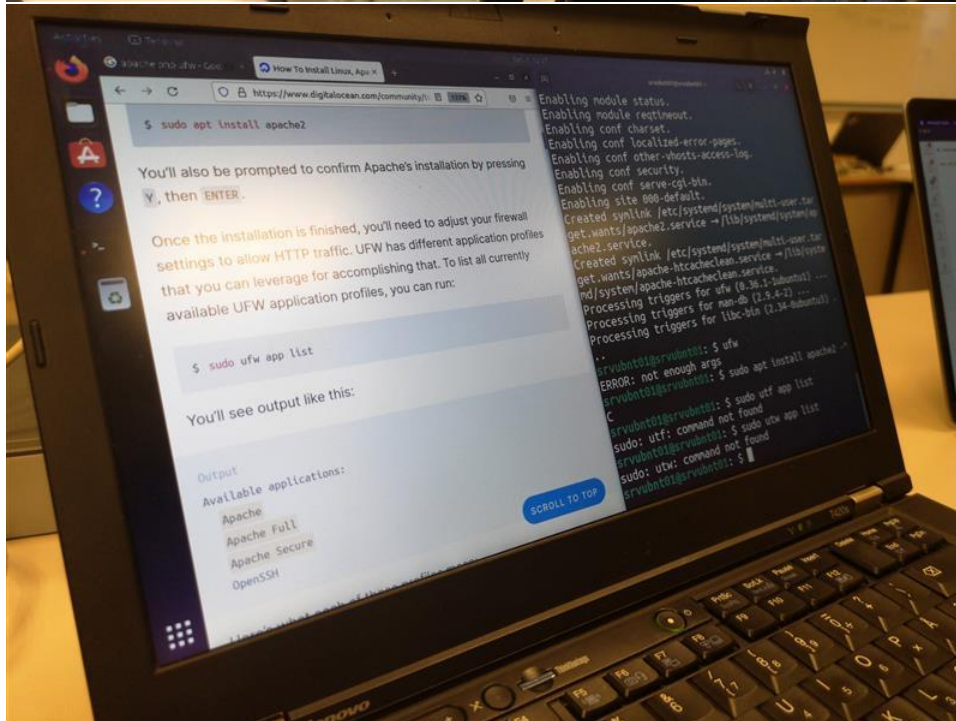
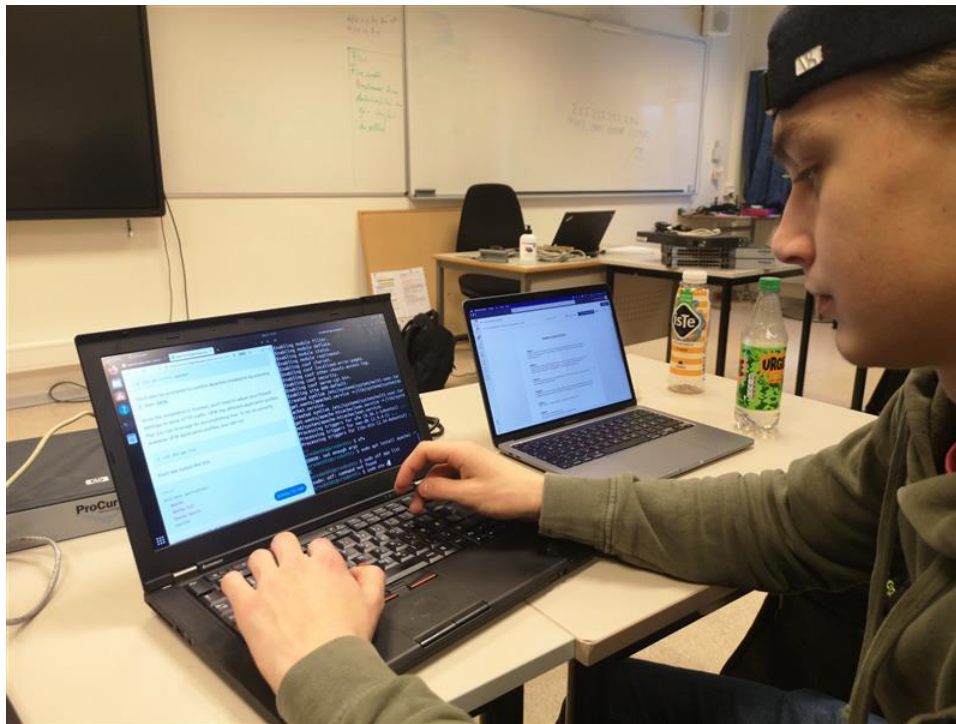
Ruleset Configuration for BLOCK\_SOSIAL

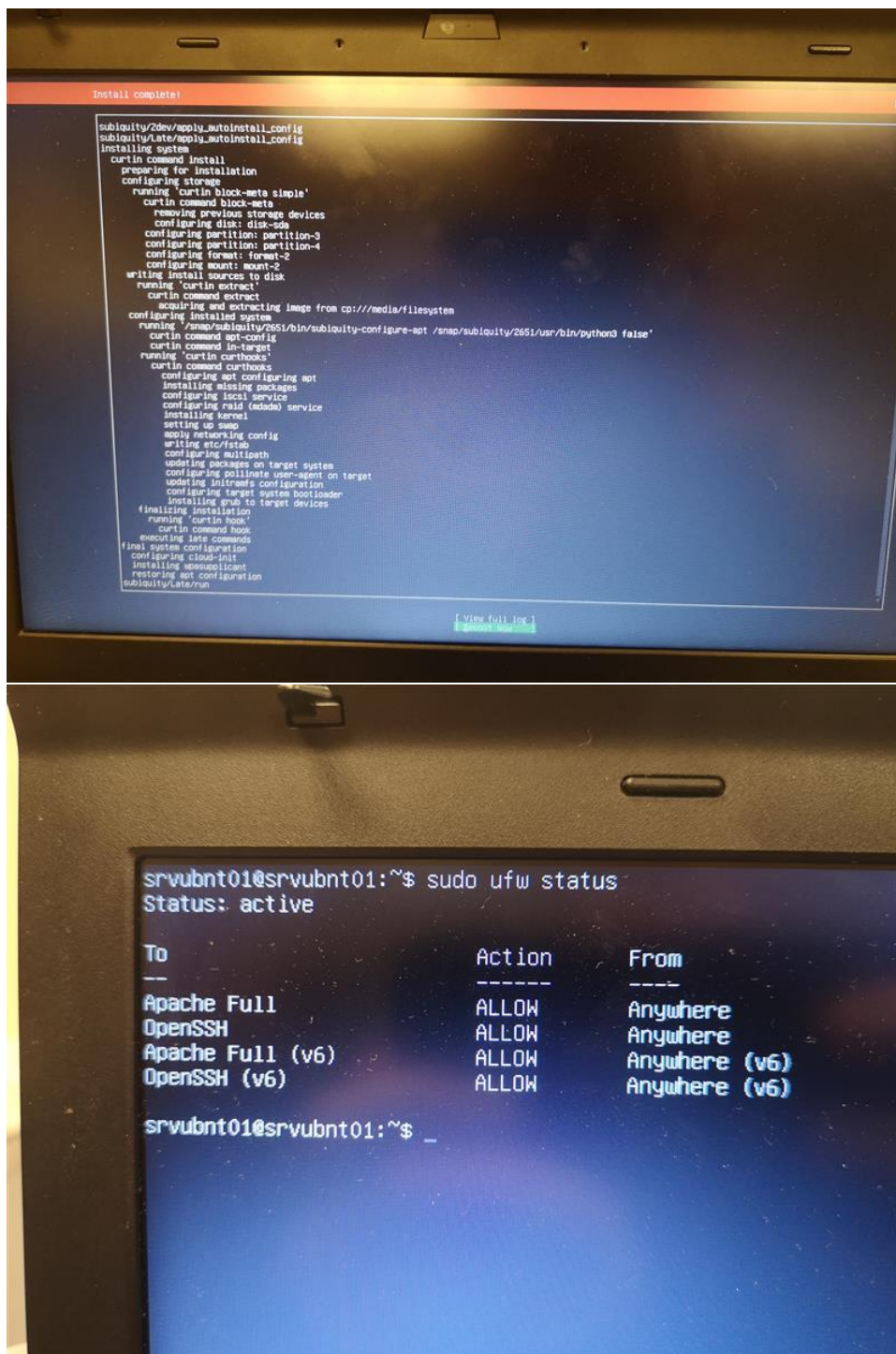
Rules Configuration Interfaces Stats

Rule ▲	Packets	Bytes	Action ⇅	Description ⇅
1	27	6544	DROP	social network
2	0	0	DROP	games
10000	20864	3516126	ACCEPT	DEFAULT ACTION

## Server

- Apache Full
- PHP
- OpenSSH





## Utvikling

Vi bruker:

- HTML
- CSS
- PHP
- JSON
- JS