

Rural Access Information Course



Lesson 2 – Competence Centre for Connectivity & Regional Inclusion

Basic Internet Foundation

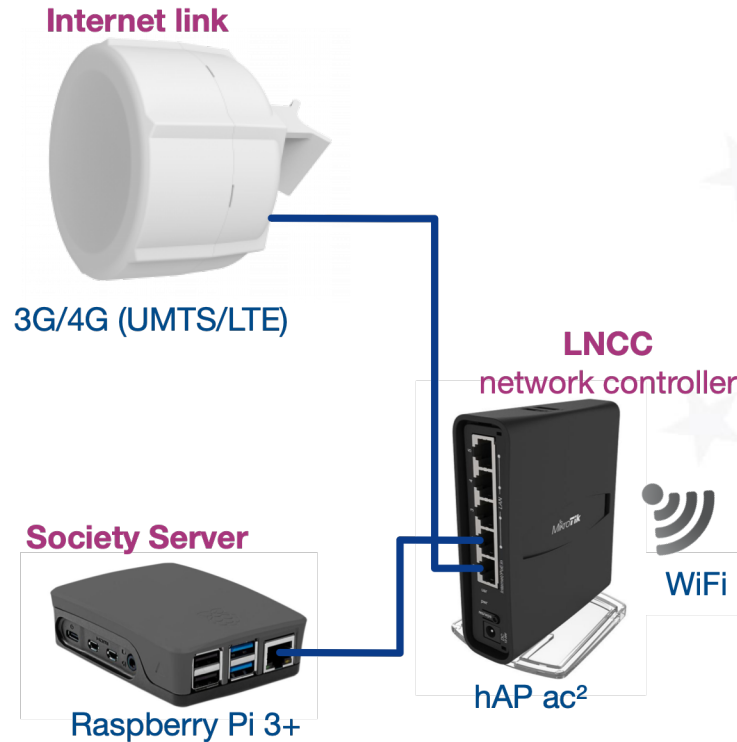
Wisam A. Mansour, Catherine Kimambo, Albert
Misilimbo, Josef Noll



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101037141. This material reflects only the views of the Consortium, and the EC cannot be held responsible for any use that may be made of the information in it.

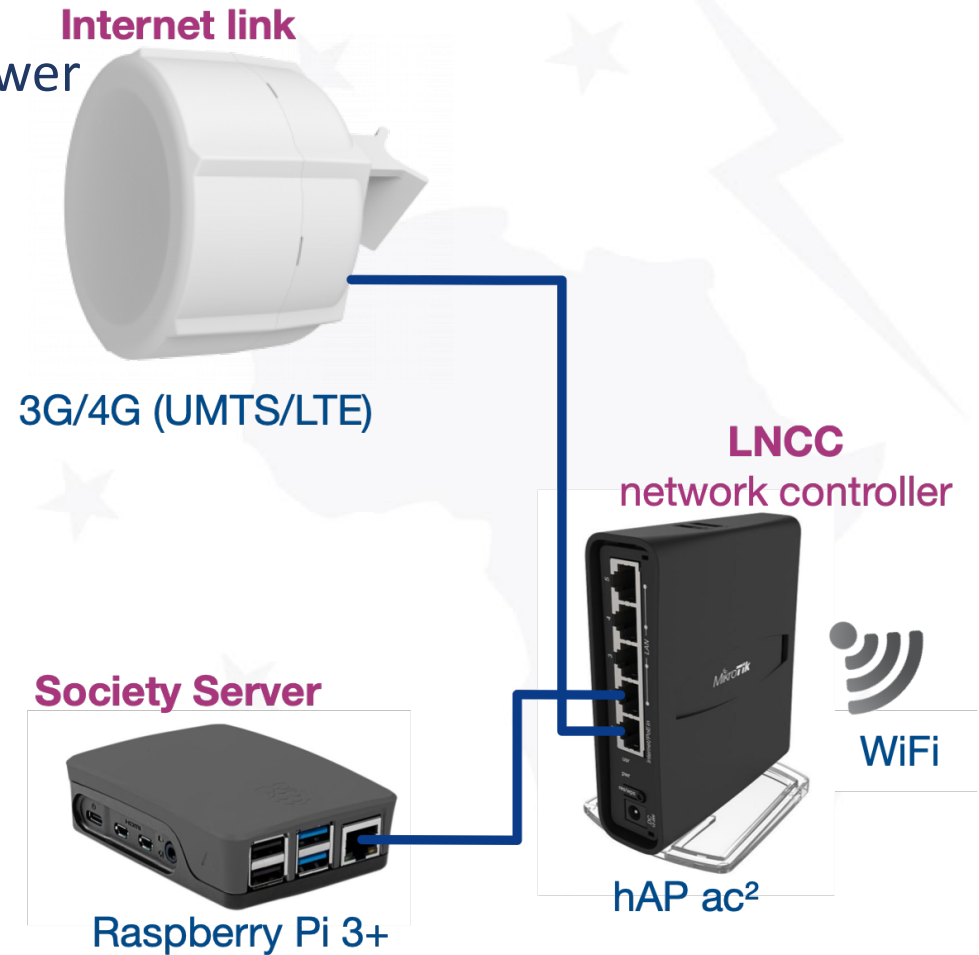
Solving the Access

- ➔ wireless information spot (InfoSpot)
- ➔ Reaching out >20 km to mobile network
- ➔ Affordable solution: OPEX less than \$20/month



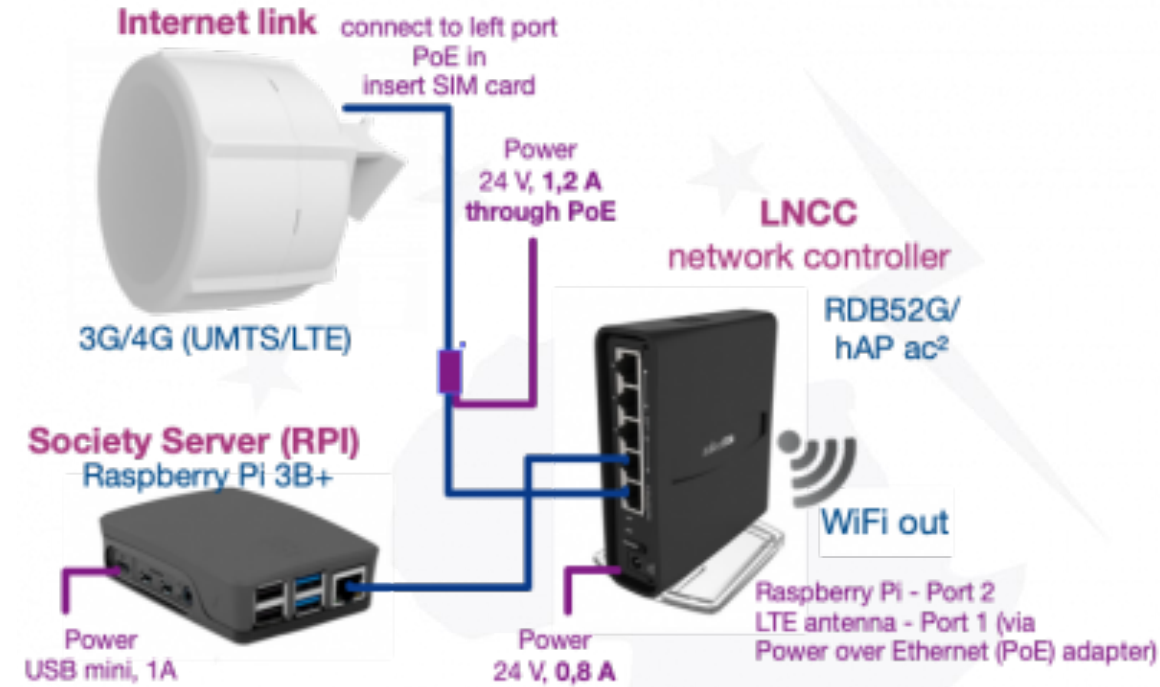
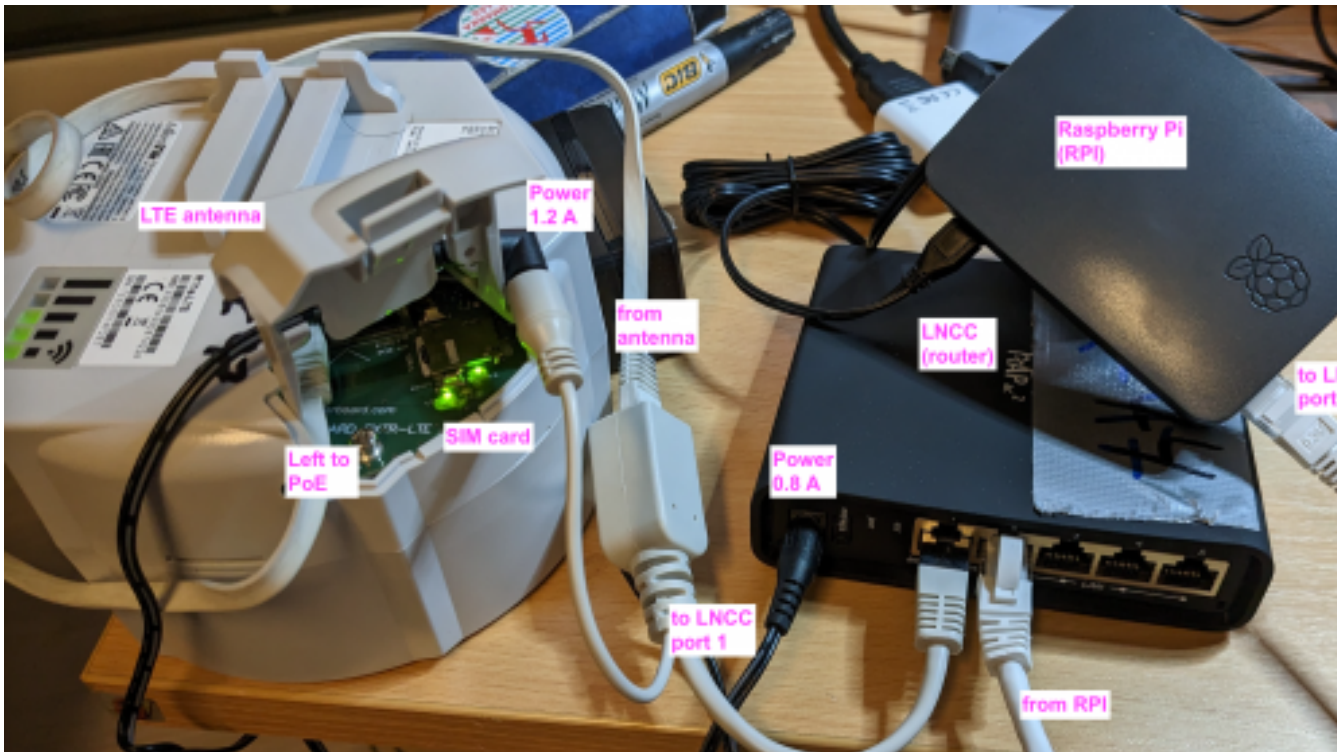
Overview & functionality

- Antenna, catching the mobile signal from the mobile radio tower and converts to mobile Internet
- Local Network Control Centre (LNCC):
 - Router with whitelist handling and
 - Signalling connecting to Basic Internet backend system for vouchers
 - Scripts for update of whitelist
- Raspberry Pi (RPI) - School-/Community Server
 - local information free available for everyone
 - Course to create a web page (Wordpress)
 - Upload & sharing data locally (Nextcloud)



Connect the cables

see <http://Problems.Basicinternet.no>



Backend System (for information)

- Information for configuration <http://Nextcloud.BasicInternet.org>
 - specific for each region, e.g. Kenya with AHERI = KEA, Gambia with IAC = GMI, Tanzania SchoolConnectivity TZS
 - own configuration files for Antenna, LNCC, and course for RPI
- Open information packages on health, ICT,... <http://Yeboo.BasicInternet.org>
- Voucher system to have e.g. 1h, 4h, 24h access
 - Creating vouchers: <http://voucher.Basicinternet.org>
 - Wiki with explanations on how to create vouchers: <http://voucher.BasicInternet.org>

Mikrotik device configuration

- See [01-MikrotikLTEantenna](#) for antenna configuration
- See [02_*LNCC_*RDB52G](#) for LNCC configuration (still to be completed)

Wiki documentation

- <http://Solutions.BasicInternet.no> - entry to describe the system
- <http://Config.BasicInternet.no> - entry point for configuration
- Course content for configuration
https://docs.google.com/document/d/1tcd4Nco8XTAmZKB1HPubMhbjUvj_LXaisZZGJe7k/
- BasicInternet = Technology
- [Open issues- ToDo](#) - lessons learned from operations




before you install the configuration, always reset/remove the default configuration on the antenna or the LNCC

Yeboo.com - your local information server

Our concept is to provide every community/school with a community/school server. On this picture), we have a local web page, as well as a local Nextcloud installation. Thus, you can

- Train to edit the local web page - and thus learn the skills for becoming a web page creator
- Share files and other information with your colleagues, citizens and students through Nextcloud
- Subscribe to Nextcloud.BasicInternet.org and download packages on health, education, entrepreneurship and more



<input type="checkbox"/>	Name	Size	Modified
<input type="checkbox"/>	 Health	2.1 GB	13 days ago
<input type="checkbox"/>	 ICT-Communication		
<input type="checkbox"/>	 Readme.md		

Basic Internet Home Zone Voucher limits User Language administrator

Your voucher batches

Name	Quantity	Upload / Download	Daily	Duration	Created
AHERI_Omuga	10	--	--	8 Days(s)	Barrack.O
AHERI_LAKALA	10	--	--	8 Days(s)	Barrack.O

Antenna configuration

- Connect cables

- Open <http://Nextcloud.BasicInternet.org>

- login: VGS
- passwd: ***

- Goto files

- 01-Mikrotik_LTE_antenna
- follow 00ReadmeConfig_latest.md







Internet antenna



power

PC med
Winbox.exe



<input type="checkbox"/>	 01-Mikrotik_LTE_antenna		...	4.5 MB
<input type="checkbox"/>	 03-RaspberryPi_VillageServer		...	996 KB
<input type="checkbox"/>	 2022_GMI_LNCC_config		...	180 KB

Nextcloud = 01-Mikrotik_LTE...

How to configure the LTE antenna

Download Winbox.exe from Mikrotik and connect your antenna. Make sure to

- connect the power over ethernet (PoE) adapter such that "data+power" goes to the antenna.
- cable connects to port 1 (PoE in), see <https://vimeo.com/354375901>

SIM card is inserted (make sure to remove the PIN)



The device will reboot. After, reboot, connect again using Winbox, and open Files

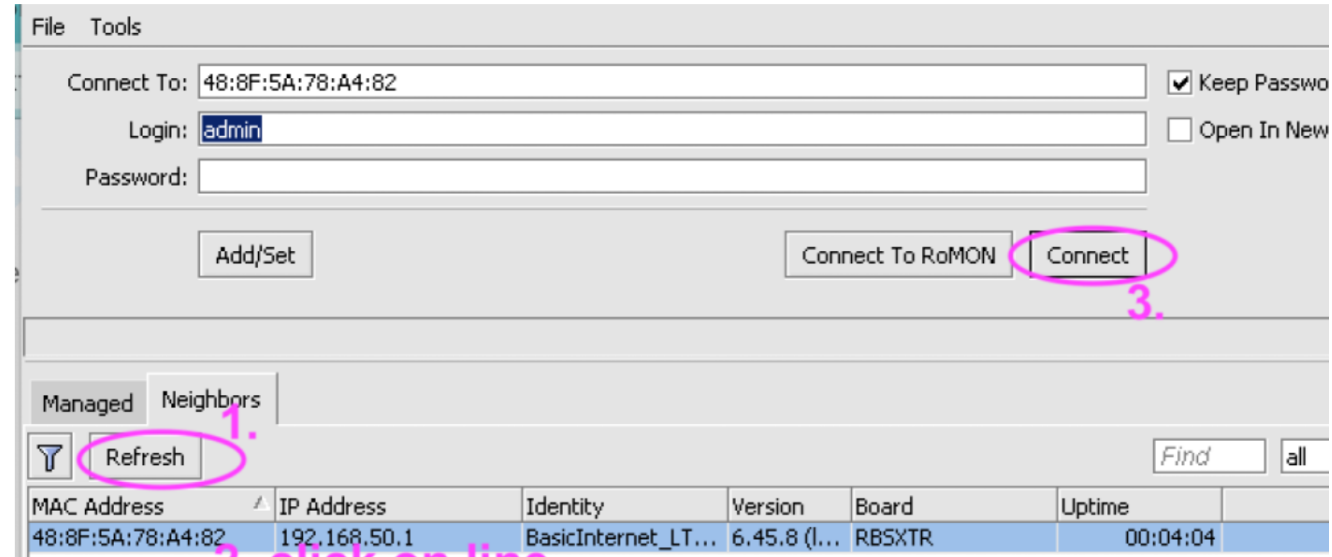
- drag the file `LTE-93-config.rsc` into the main directory
- open `New Terminal` and run command `import file=LTE-93-config.rsc`

The configuration will be loaded, and the the antenna reboots

- reconnect through Winbox, open `New Terminal` and add the password `/user set 0 password=B@sicInternet_2019`

On success, you'll see a screen like Figure 5

```
.....
[admin@MikroTik] /ip firewall filter> add action=drop chain=forward comment=\
\... "defconf: drop all from WAN not DSTNATed" connection-nat-state=!dstnat \
\... connection-state=new in-interface-list=WAN
```



2. click on line

Control the LTE antenna configuration

Nextcloud = 01-Mikrotik-antenna = 01Control.md

Control the configuration of the LTE antenna

After connectivity and configuration, see [00Readme.md](#), check that your antenna works as expected

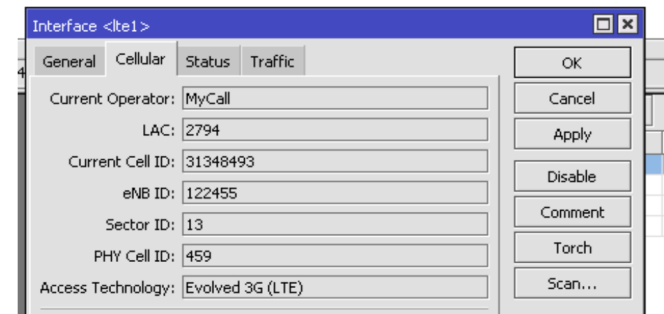
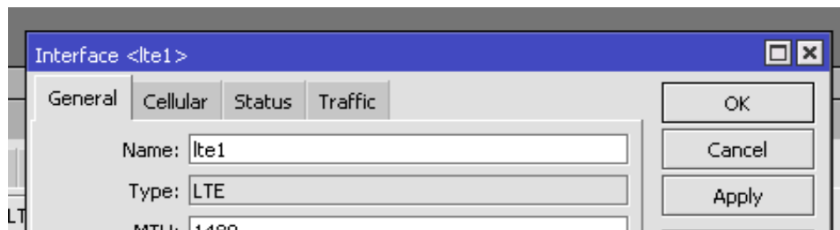
Control the APN settings

Check that the **two diodes** are on, showing power & association to the network

In Winbox, check that the LTE APN has the default settings Internet
`/interface lte apn add name=default apn=internet`

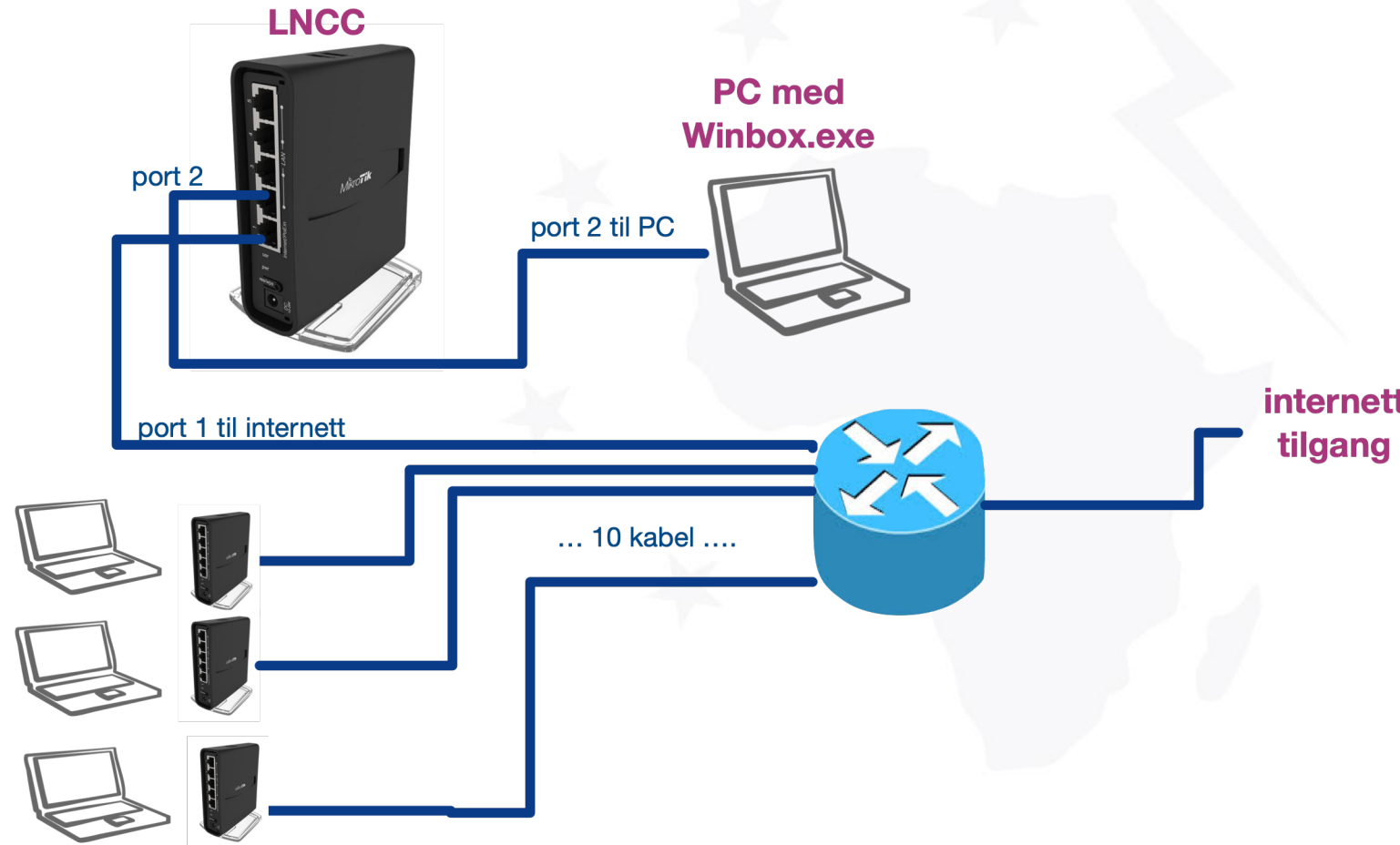
in Winbox, check that GSM is `Guest` ed
`/interface lte set network-mode=3g,lte lte1`

- Paste the following into a Winbox = new terminal, or go through the winbox interface
- Check if the SIM card is connected to the network, see: "enabled" and "running" in the bottom of the window



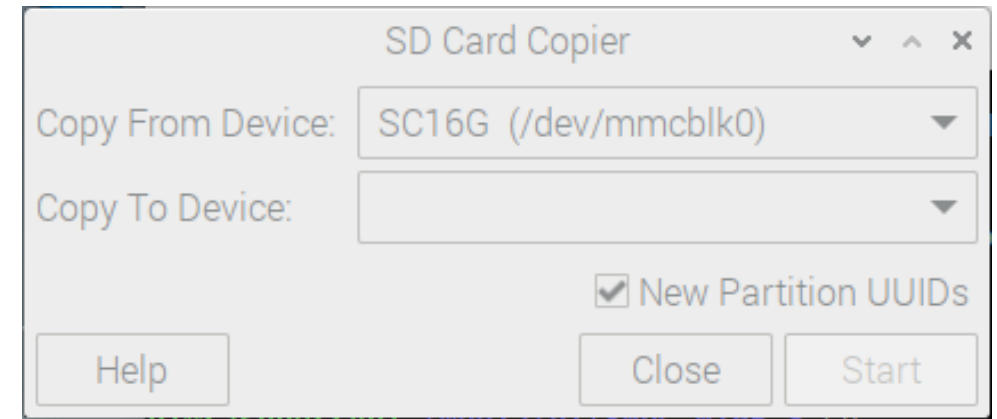
Configuration of LNCC

- Cabling
 - Port 2 to PC
 - Port 1 to Internet (via router)
- Follow-steps in
 - Nextcloud =
2022_GMI_LNCC_config =
00_LNCC_GMI_config_latest
.md



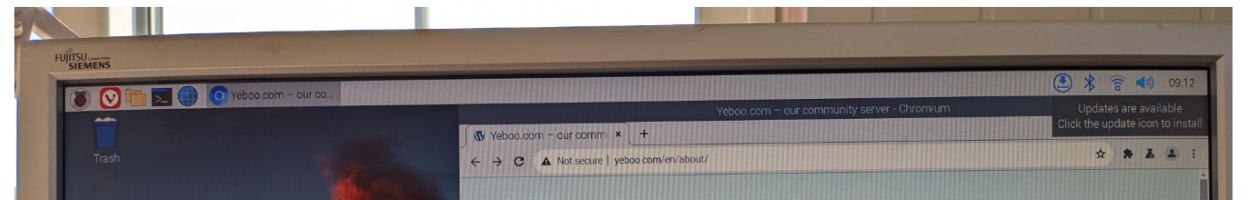
Raspberry Pi (RPI) config

- Unpack and set together
- Copy SD card (SD Card Copier)
- Information on
 - Nextcloud = Yeboo = ICT-Communications = Readme.md
- See other information



About your village server

We use a Raspberry Pi (RPI) as a local village/school server. The Raspberry Pi has a local Wordpress and a [Nextcloud](#) installation, thus does not need a network connection for access to the information. When everything works as expected, the RPI will boot up into a screen with a local home page called "yeboo.com". Here you see the links on how to edit the [wordpress](#) (yeboo.com/wp-admin) and the local [nextcloud](#) installation.

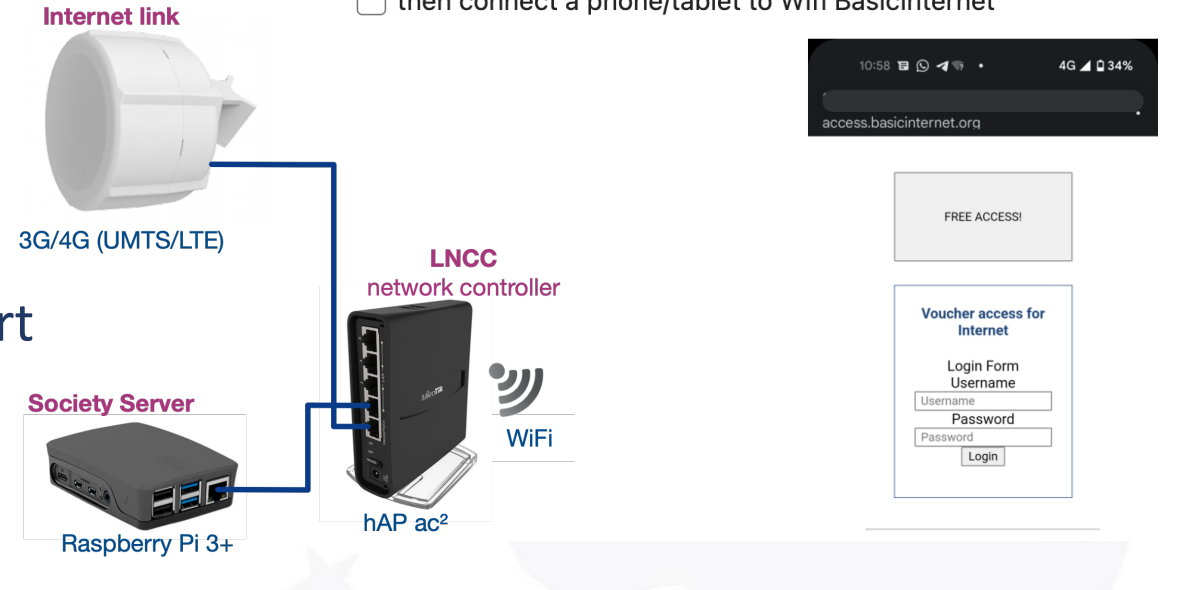


Final check

- Connect all cables
- Insert SIM in antenna (or Internet cable into port 2)
- Connect with your phone to SSID BasicInternet
- Click “Free Access”
- Connected to Raspberry Pi
- Add voucher
- Connect to NRK.no (or other Internet sites)

Connect Antenna to LNCC

- Connect the cable from the antenna to port 1 of the LNCC,
- then connect a phone/tablet to Wifi BasicInternet



Test vouchers, on success you come to the status page, showing how much you have used <http://access.basicinternet.org>



Welcome to Basic Internet!

IP address:	10.5.50.254
bytes up/down:	1338 B / 0 B
connected / left:	0s / 1h
status refresh:	1m

log off

Take the course, and empower your community



Course Content

- L0:** Intro
- L1:** Regional Competence Centre (RCC) for connectivity and regional inclusion
- L2:** Regional SESA InfoSpots for energy empowerment
- L3:** Digital inclusion and sustainable development in rural regions
- L4:** Providing Information on Energy

