**Rural Access Information Course** 



### Lesson 2 – Competence Centre for Connectivity & Regional Inclusion

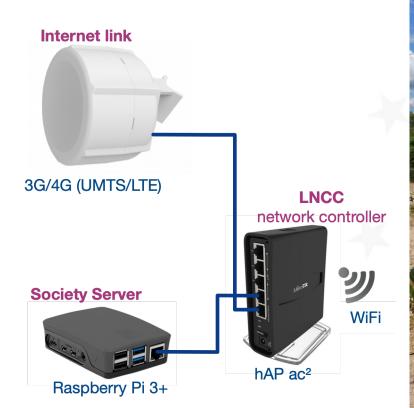
### Basic Internet Foundation Wisam A. Mansour, Catherine Kimambo, Albert Misilimbo, Josef Noll



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## **Solving the Access**

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

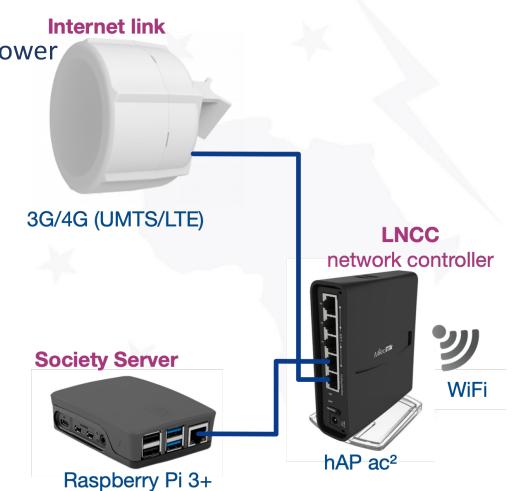






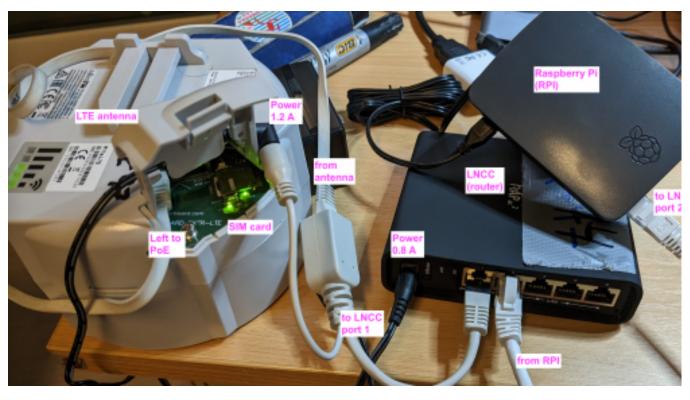
## **Overview & functionality**

- 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 <u>http://Problems.Basicinternet.no</u>







SESA

# Backend System (for information)

- Information for configuration <u>http://Nextcloud.BasicInternet.org</u>
- 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,... <u>http://</u> <u>Yeboo.BasicInternet.org</u>
- Voucher system to have e.g. 1h, 4h, 24h access
- Creating vouchers: <u>http://voucher.Basicinternet.org</u>
- Wiki with explanations on how to create vouchers: http:// voucher.BasicInternet.org

#### Mikrotik device configuration

- See <u>01-MikrotikLTEantenna</u> for antenna configuration
- See <u>02\_\*LNCC\_\*RDB52G</u> for LNCC configuration (still to be completed)

#### Wiki documentation

- <u>http://Solutions.BasicInternet.no</u> entry to describe the system
- <u>http://Config.BasicInternet.no</u> entry point for configuration
- Course content for configuration <u>https://docs.google.com/document/d/1tcd4Nco8XTAmZKB1HPubMhbjUvj\_LXaisZZGJe7k</u>
- BasicInternet = Technology
- <u>Open issues- ToDo</u> 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 se 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 create
- Share files and other information with your colleagues, citizens and students through Nexi
- Subscribe to <u>Nextcloud.BasicInternet.org</u> and download packages on health, education, a
  entrepreneurship and more



#### Your voucher batches

Readme.mc

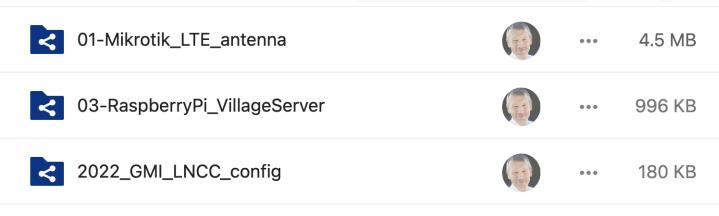
Name	Quantity	Upload / Download	Daily	Duration	Creato
AHERI_Omuga	10	-/-	-	8 Days(s)	Barrack.O
AHERI_AKALA	10	-/-	-	8 Days(s)	Barrack.O

# Antenna configuration

• Connect cables



- login: VGS
- passwd: \*\*\*
- Goto files
  - 01-Mikrotik\_LTE\_antenna
  - follow 00ReadmeConfig\_latest.md



power

PoE

port 1

PC med

Winbox.exe

### 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 <u>https://vimeo.com/354375901</u>

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 <u>Terminal and</u> 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=\

N... "defconf: drop all from WAN not DSTNATed" connection-nat-state=!dstnat N

\... connection-state=new in-interface-list=WAN

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File Tools							
Connect To:	48:8F:	5A:78:A4:82				🗸 Ke	ep Passwo
Login:	admin						en In New
Password:							
	Add/S	iet		Conr	nect To RoMON	Connect	
						<u>J</u> .	
Managed Neig	ghbors						
Refresh	D.					Find	all
MAC Address	A	IP Address	Identity	Version	Board	Uptime	
48:8F:5A:78:A4:	82	192,168,50,1	BasicInternet_LT	6.45.8 (l	RBSXTR	00:04:04	
	2.	CIICK ON II	ne				



### **Control the LTE antenna configuration Nextcloud = 01-Mikrotik-antenna = 01Control.md**

### Control the configuration of the LTE antenna

After connectivity and configuration, see <u>**OOReadme.md**</u>, check that your antenna works as expected

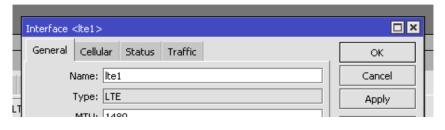
#### **Control the APN settings**

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 Ite app add name=default app=internet

in Winbox, check that GSM is ( <sup>Guest</sup> ed

/interface Ite set network-mode=3g,Ite Ite1



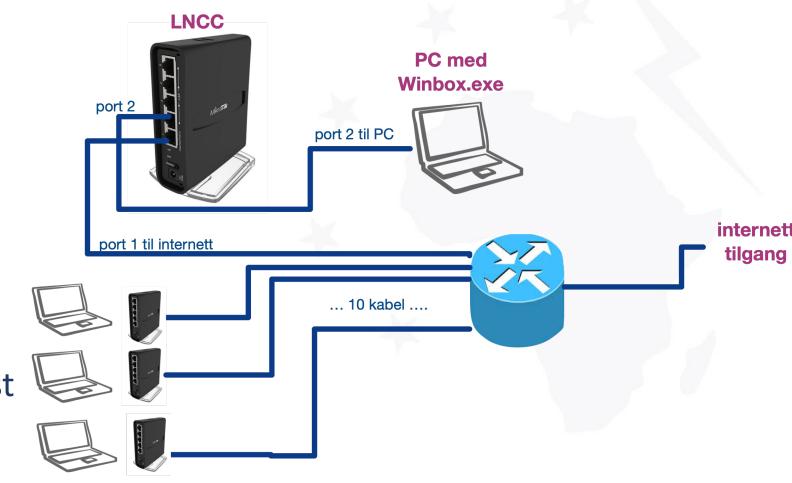
Paste the following into a Winbox = new terminal, or go through the winbox interface

Check if the SIM card is connected to the network, see: "enabled" and "running" in the bottom of the window

Interface < te1>	
General Cellular Status Traffic	ок
Current Operator: MyCall	Cancel
LAC: 2794	Apply
Current Cell ID: 31348493	Disable
eNB ID: 122455	Comment
Sector ID: 13	Torch
PHY Cell ID: 459 Access Technology: Evolved 3G (LTE)	Scan
Access rechnology, Evolved 3d (LTE)	

# **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



# LNCC config

### **Connect the LNCC to the PC**

Download Winbox.exe for configuration of the Mikrotik from a PC

Connect a cable from port 2 of the LNCC to your PC. Ensure that the PC connects through the Ethernet - see <u>antenna configuration as an example</u>

Reset the configuration (System = Reset configuration - ensure that there is no default configuration) - system will reboot after "Reset Configuration"

h/Bl_hotspot/redirect.html	.html file	318 B Jan/02/1970	03:25:46
h/BL hotspot/status.html	html file	3194 B Jan/02/1970	03:25:46
h Reset Configuration			3:07:05
fl			3:25:30
fl Ke	ep User Configuration	Reset Configuration	3:25:31
f]			3:25:31
fi CA	NPS Mode	Cancel	3:25:31
fl 🗸 No	Default Configuration		3:25:30
FI			3:25:30
fi Do	Not Backup		3:25:30
	2		2.00.02

## 2022\_GMI\_LNCC\_config **01** InstallFiles Name 🔺 flash GMI-02-sstpkenya71.src LastWhitelist. **Replace with** GMI-02-sstpkenyaXX.src (your LNCC)

### **Test configuration of LNCC**

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• Nextcloud = 2022\_GMI\_LNCC\_config = 02-Control\_LNCC.md

02-Control\_LNCC.md

#### $5 \stackrel{?}{\circ} B I \stackrel{!}{\sqcup} \stackrel{!}{\div} H2 \stackrel{!}{\equiv} \stackrel{!}{\equiv} 11 1 1 + 12 1 = 12 1 1 + 12 1 = 12 1 + 12$

### **Control the installation of the LNCC**

On Winbox, open the log file and search for <u>sstp-tanzania</u> - if it says *connecting, authenticated and connect*, then your LNCC is connected to the <u>Maincorerouter</u>.

#### 1. Check if the LNCC connects to the Maincorerouter

Open the log file in Winbox, and see if the LNCC is connecting to the <u>Maincorerouter</u>, ensure that port 1 of the LNCC is either connected to a network (cable) or to an LTE antenna

				Guest		
	- J-1	panyeoyeoee i vie ne n	momory	incorrace, inite	outorz miklap (opoca za) ranaapieky	
$\triangleright$	32	Jan/25/2022 19:24:24	memory	dhcp, info	dhcp-client on ether1 got IP address 192.168.188.56	
	- 33	Jan/25/2022 19:24:26	memory	sstp, ppp, info	sstp-tanzania: initializing	
	34	Jan/25/2022 19:24:26	memory	sstp, ppp, info	sstp-tanzania: connecting	
	35	Jan/25/2022 19:24:27	memory	sstp, ppp, info	sstp-tanzania: authenticated	
	36	Jan/25/2022 19:24:27	memory	sstp, ppp, info	sstp-tanzania: connected	
	37	Jan/26/2022 15:26:09	memory	dhcp, info	HSDHCP deassigned 10.5.50.254 from F6:33:1D:CC:DC:75	
	38	Jan/26/2022 20:57:28	memory	wireless, info	A4:83:E7:74:4C:0A@wlan1: connected, signal strength -40	
				10		

Check\_Server\_re...

# **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

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	SD Card Co	pier	~ ^ X
Copy From Device:	SC16G (/de	v/mmcblk0)	•
Copy To Device:			•
		🗹 New Part	ition UUIDs
Help		Close	Start

### 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 <u>Nextcloud</u> 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 <u>wordpress</u> (yeboo.com/wp-admin) and the local <u>nextcloud</u> installation.





### **Connect Antenna to LNCC**

Connect the cable from the antenna to port 1 of the LNCC,

then connect a phone/tablet to Wifi BasicInternet

### **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 <u>NRK.no</u> (or other Internet sites)



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

12	:03 🕓 in 🕪 33	• *	▼⊿ 🔒 67%
	Welcome to Ba	sic Internet!	
	IP address:	10.5.50.254	
	bytes up/down:	1338 B / 0 B	
c	onnected / left:	0s / 1h	
	status refresh:	1m	1
	log o	ff	



# Take the course, and empower your community



**Course Content** 

LO: 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





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