SESA
Smart Energy Solutions for Africa

PRACTICAL OPERATION AND MAINTENANCE MANUAL ON COMMUNITY INFORMATION SPOTS (INFOSPOTS)

Establishing, Testing, & Management

Authors: Wisam Mansour, Prof. Josef Noll, Jonathan Muringani, Catherine Kimambo, Basic Internet Foundation.

Reviewers: Silvia Assalini, Alina Mures, Alessia Manzato (ICLEI Europe).

contact@sesaeuafrica.eu
sesa-euafrica.eu

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Abbreviation	Definition description
BIF	Basic Internet Foundation
dBm	Decibel milli-watts
LNCC	Local Network Control Centre
MCC	Mobile Country Code
MCU	Mobile Control Unit
MNC	Mobile Network Code
PoE	Power over Internet
RPI	Raspberry Pi

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Disclaimer

SESA (Grant Agreement No. 101037141) is an Innovation Action project funded by the EU Framework Programme Horizon 2020. This document provides information on the core activities, findings, and outcomes of the SESA project. The content of this publication reflects the work of the SESA consortium and is not intended to represent the views of the European Commission.

The information presented in this guide is for general informational purposes only and should not be seen as a substitute for professional advice. Always seek the expertise of qualified professionals to ensure that the InfoSpot is maintained safely and in compliance with local regulations.

All images included in this document are created by the Basic Internet Foundation, either as original drawings, in-house designs, or photographs taken by the team.

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Introduction

This capacity-building manual was developed as part of the SESA project – Smart Energy Solutions for Africa, funded by the European Union's Research & Innovation funds. It is designed to serve system operators, local communities, and everyday users. The primary goals of the manual are as follows:

1. To provide local community leaders and operators with valuable insights into the operational efficiency of the local Information Spots (InfoSpot). This includes the knowledge and skills necessary to install, test, manage, and utilize these systems effectively.
2. To offer detailed guidance on performing routine tasks, troubleshooting common issues, and identifying when to seek expert assistance.
3. To empower general users, such as schools and small rural communities, by enhancing their understanding of their InfoSpot. This includes grasping the equipment's basic operation, monitoring its performance, and recognizing its benefits.

As well, it offers several key advantages:

1. It helps save costs by reducing unnecessary expenses (e.g., repairs, energy waste) through educating users and local communities on the best practices for operating and maintaining InfoSpots.
2. It supports the empowerment of communities and promotes sustainable practices, which contributes to bridging the digital divide and reducing the cost of accessing information.
3. It aids users in maintaining sustainable and reliable access to the Internet, promoting local development.
4. It serves as an essential resource for those involved in operating InfoSpots, offering practical, efficient, and security-focused guidance.

1. Basics of the InfoSpots

An InfoSpot is a localised internet access point that combines hardware (antenna, router, server) and software to enable access to information that would otherwise be difficult. InfoSpots are strategically deployed in underserved areas (schools, rural communities) **where traditional internet infrastructure is weak or unaffordable**. By leveraging existing mobile networks and local servers, they minimize operational costs while maximizing accessibility.

Figure 1 illustrates the distributed architecture of the InfoSpot system, which consists of three key components:

- **LTE/3G Antenna**: Captures weak mobile signals using elevated positioning and directional antennas to amplify connectivity (typically 18–25 dBm gain).
- **Local Network Control Centre (LNCC)**: Acts as a router, managing Wi-Fi distribution

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and traffic prioritization (e.g., redirecting users to the local server for free content).

- **Local Server (Raspberry Pi)**: Hosts cached or locally stored content (e.g., Yeboo.com, Nextcloud) to reduce reliance on external bandwidth.

This setup ensures that even in low-coverage areas, communities can access critical information without incurring high data costs. For further details, see the Basic Internet Foundation Wiki.

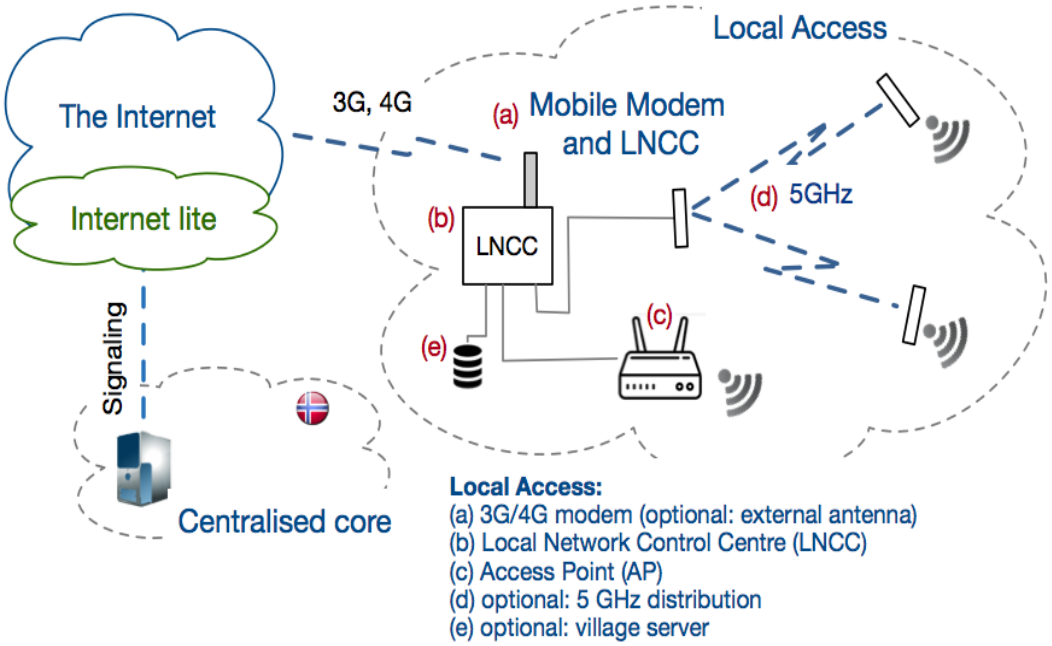

Figure 1: InfoSpot concept for distributed information access

1.1 The "Internet lite for all" Concept and Freemium model

The "Internet Lite for All" concept is designed to bridge the digital divide by providing equitable access to essential online resources while managing bandwidth constraints. At its core, the concept leverages a freemium business model (free + premium) to deliver basic information (text, images, and local videos) for free, while premium access is required for bandwidth-intensive services like streaming or large downloads.

The freemium model in InfoSpots balances sustainability with inclusivity and it operates as follow:

- **Free Access**: Covers essential information (e.g., health, education, government services) hosted on the local server (Yeboo.com/Nextcloud), access text-based websites, and local services without authentication, consuming minimal bandwidth.
- **Premium Access**: Funded through vouchers, enabling high-bandwidth activities (e.g., video calls, streaming). Vouchers are priced to cover data costs, often subsidized by partnerships (e.g., NGOs, local businesses).

This model aligns with the Basic Internet Foundation's mission to "provide free access to information for all" while ensuring system longevity. For implementation examples, see the SESA Project Case Studies.

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2. Establishing an Information Spot (InfoSpot)

The procedure of establishing an InfoSpot is based on the usage of the signal coverage provided by local Telecom Operators. In many areas of Africa, especially the remote ones, fixed-line communication infrastructure, whether publicly or privately owned, is scarce or non-existent. As a result, internet access relies on mobile service providers, which can leverage their existing satellite networks to provide connectivity.
When a mobile operator provides mobile broadband coverage in a 20-25 km radius around a school or community, the InfoSpot can utilize the mobile network in the area. The main achievement is to move from ground-based access to elevated access (typically 6 m over ground) and use a directive antenna to reach the mobile network. The corresponding 18-25 dBm increase in signal strength allows mobile network reception even in places where you can't get any network from your mobile phone. All operators transmit a "pilot signal" to indicate network availability, which BasicInternet uses to identify the network. The advanced access allows us to connect to the network almost everywhere.

The following steps are explained in this section:

2.1. Measure the available networks from the operators
2.2. Identify the direction of the closest tower
2.3. Measure field strength and technology
2.4. Create a map with buildings and distances

2.1. Measure the available networks from the operators

Open your phone:

1. Go to Settings
2. Select Network & Internet
3. Select Mobile Network
4. Select Network Operators
5. Search Networks. It will take some minutes to show all networks.

Figure 2 shows, as an example, the result of the Network Search, showing a total of 6 operators, the top 4 offering a 2G network are Tigo, 64009 (which is Halotel), Vodacom and Airtel. In addition, Vodacom and 64009 (Halotel) offer a 3G network. The normal ranking is after the strength of the mobile network, pointing out that the 3G networks are weaker than the 2G networks.

Note: As shown in Figure 3, the operator code is put together from the mobile country code (MCC, here: 640 for Tanzania) and the mobile network operators (MNC, here 02 tiGO - 09 Hits=Halotel). See Wikipedia Mobile Country Code (MCC), and Mobile Network Codes (MNC).

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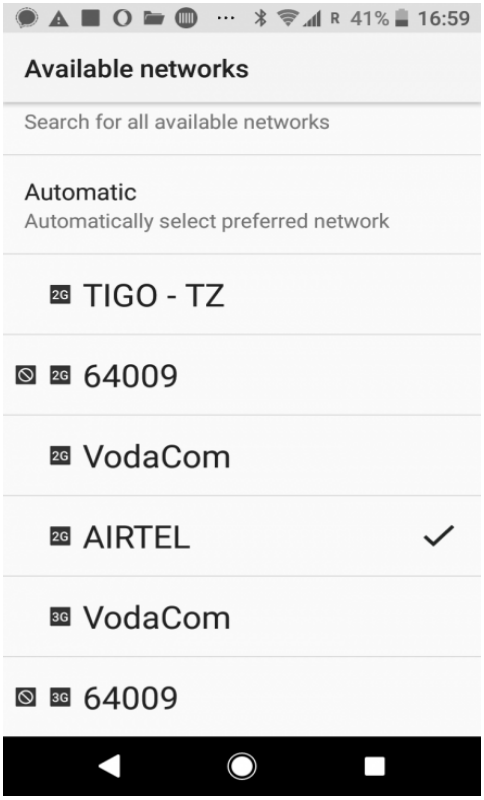

Figure 2: Results of Network Search, showing both the operators and the networks they provide

MCC	MNC	Brand	Operat
640	02	tiGO	MIC Tanzania
640	03	Zantel	Zanzibar Telec
640	04	Vodacom	Vodacom Tanzania Limit
640	05	Airtel	Bharti Airtel
640	06	Sasatel	Dovetel Limite
640	07	TTCL Mobile	Tanzania Telecommunic Company LTD
640	08	Benson Online (BOL)	Benson Inform Limited
640	09	Hits	ExcellentCom Tanzania Limit
640	11	SmileCom	Smile Telecom Holdings Ltd.

Figure 3: List of Network Operators in Tanzania

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2.2. Identify the direction of closest tower

Note: smartphones automatically connect to the best network. Thus, if you have a good 2G (GSM) network and a weak 3G (UMTS) network, the phone will report from the 2G network. In this case, you need to fix your phone to the 3G (or 4G) network.

Open your phone:

1. Go to Settings
2. Select Network & Internet
3. Select Mobile Network
4. Select Preferred network type
5. Select 3G only (or 4G only). Now your phone is set to use 3G only, providing us with stable 3G measurements.

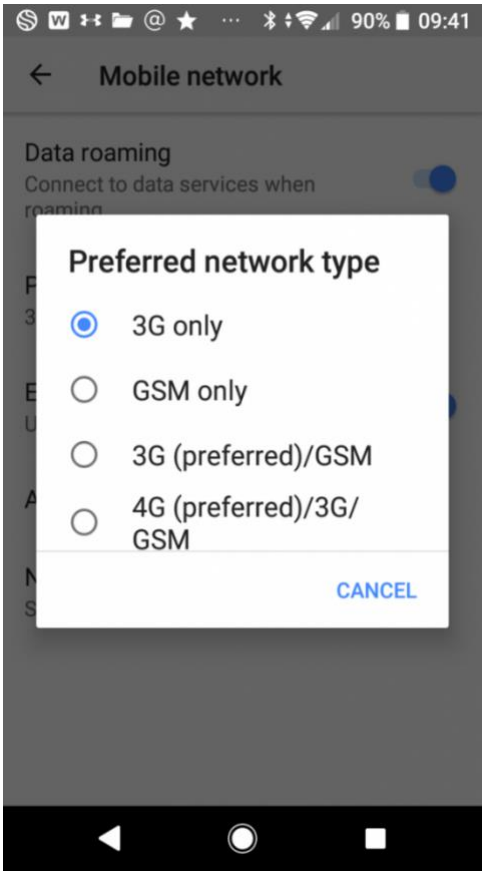

Figure 4: Select 3G (4G) as connection modus on your phone

2.3. Measure field strength and technology

Download any freely available application for measuring signal strength (e.g. as Network Call Info Lite). If you have an Android phone, open Network Cell Info Lite or any similar app. You will see the following screens:

- **Gauge**: gives you the current field strength, here: -91 dBm from VodaCom using the UMTS (3G) network (see Figure 5b)

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- **Raw**: provides more info (see Figure 5c), needed to analyse the mobile networks with neighbouring antennas. Here you see that we have the Network in Tanzania (MCC=640), operator (MCU=4) and some more technical details
- **PLOT**: used to see the variation of the field strength (see Figure 5a). Through PLOT we can measure the direction to the tower. Hold the phone in front of your chest (ca. 20-30 cm distance) and slowly turn around 360 degrees. In the diagram, you will see that we reached twice the peak of -99 dBm, and in the opposite direction, the field strength went down to -109 dBm.

  With an operator selected (see Figure 4), the field strength is measured through Network Cell Info (Figure 5a). Information about the field strength is recorded while performing a 360 degrees turn, and the mobile tower is located in the direction of the strongest signal.

In our example from Izazi, Tanzania, where all the measurements were done, we see that we have an "orange" signal, and in certain directions, a red signal. These measures were performed while standing on the roof of a car and demonstrate that a person on the ground will not be able to connect to a 3G network, because the field strength is too low. But, using a) a pole and b) a directive antenna helps us to get a sufficient signal to reach the Internet.

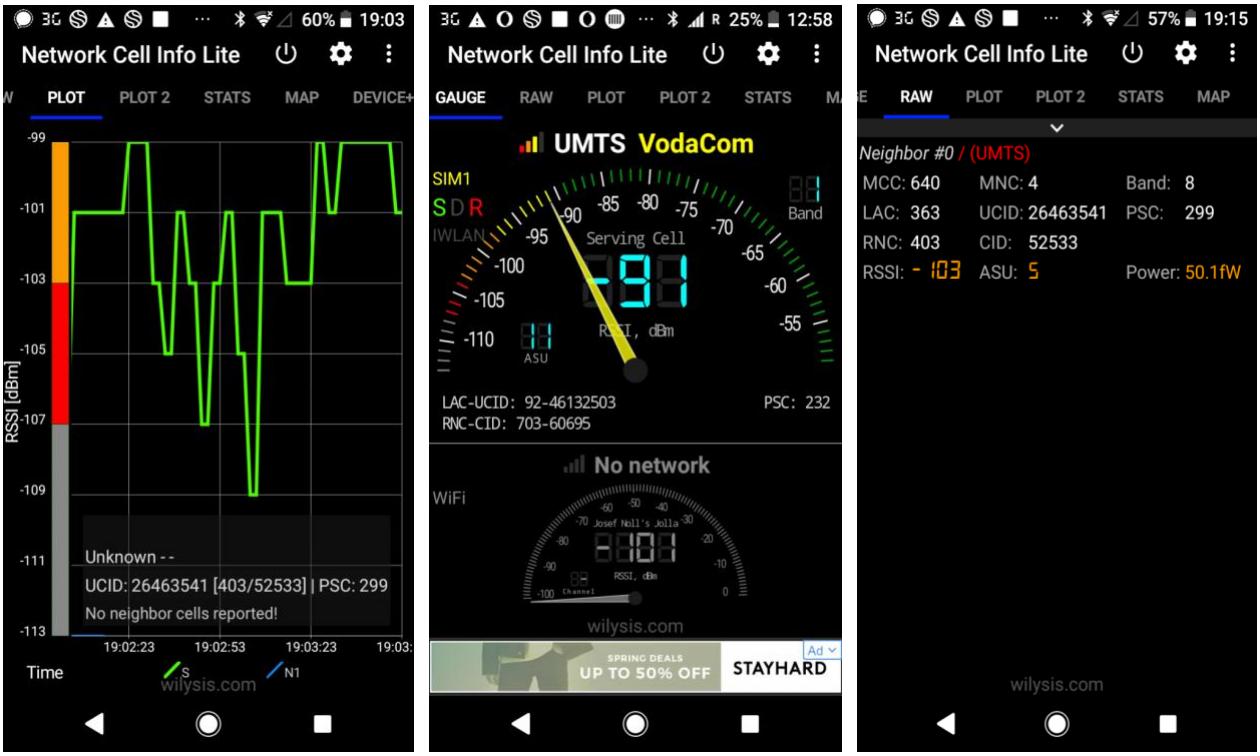

Figure 5a, 5b, 5c: Local network measures

2.4. Create a map with buildings and distances

In order to record where the connectivity took place, we use the PlusCodes identifier of locations. PlusCodes (also called Open Location Codes) is a free, open source addressing system developed by Google to provide simple and accurate location identifiers for any place on Earth, especially in areas lacking formal street addresses. The identification of buildings can

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be performed based on the available satellite links before you go to the field.

In a browser, open http://plus.codes/map and click on the 3 horizontal bars to select the satellite view

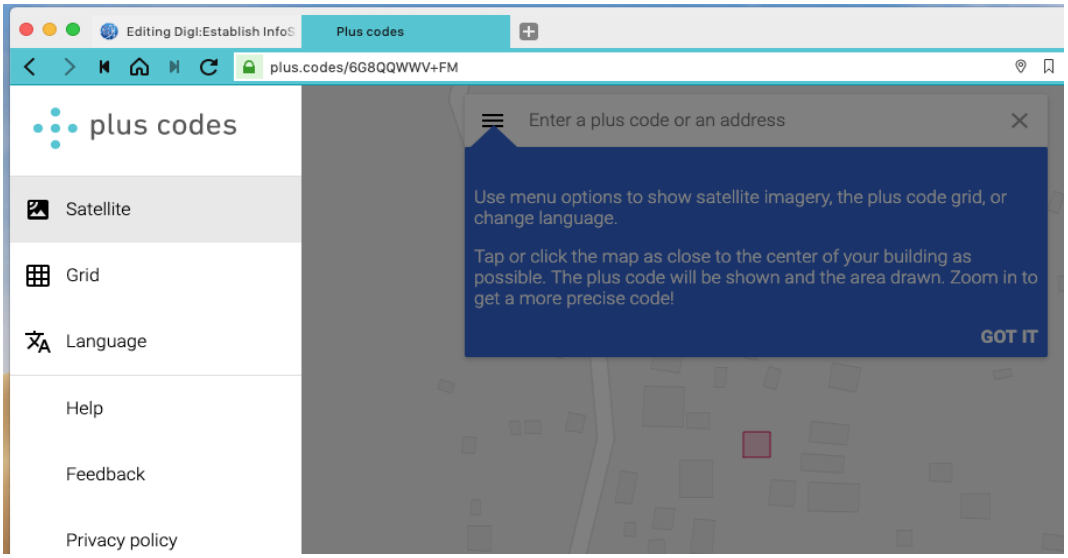

Figure 6: PlusCodes Map, select 3 bars and satellite view

Identify the houses to be connected and write down the "Plus Code address". Alternatively, make a screenshot.

Figure 7: In the satellite view, identify the houses to be used for the InformationSpot

3. Local Community InfoSpot Connection

The concept of creating local InfoSpots is based on three components (see Figure 8)

- a **receive antenna** ("Internet Link") to ensure a good quality of the mobile network link,
- a **router** being the Local Network Control Centre (LNCC) to provide Wi-Fi, a local network and ensure that all incoming traffic is re-routed to the information on the

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- **local school-/community server**, in our case, a Raspberry Pi. The Raspberry Pi is a minicomputer, but any computer will act as a local server for your school/community network.

Figure 8: Equipment and layout of the local network

For an introduction on the steps to create an InfoSpot, please visit: http://HowTo.BasicInternet.no our school / community.

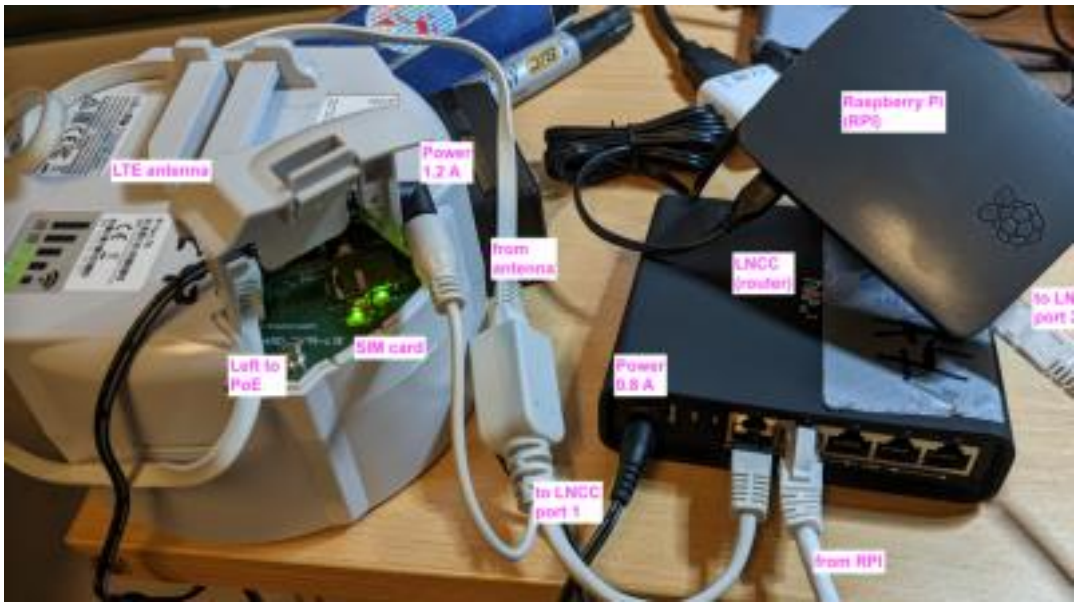

Figure 9: Initial equipment connection for testing

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3.1. InfoSpots equipment list

- 1 pc - Internet link (LTE)

- 1 pc - Local Network Control Centre (LNCC)

- 3 pc - cable

- 1 pc - local SIM card

- PoE

Figure 10: InfoSpots equipment list

3.2. Setting up the InfoSpots

Before performing the test, please connect all cables according to Figure 9.

1. The **LTE antenna** has the long Internet cable connected on the left side inside the antenna, and the other side of the Internet cable goes into the Power over Internet (PoE) adapter.

   Note 1: The SIM card is a MicroSIM and needs to be pushed into the slot. Make sure that

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the SIM has no PIN code

*Note 2: The PoE power supply for the antenna **needs 1.2 A** (please check and don't exchange with the power supply of the LNCC, which only needs 0.8 A)*

2. The **LNCC** has a 0.8 A power supply. The PoE cable from the antenna is connected to port 1, and the Internet cable from the Raspberry Pi is on Port 2
3. The **Raspberry Pi** is connected through an Internet cable to Port 2 of the LNCC

Our recommendation is that you first perform the test in the lab, before moving out to the field. The reason is that the network in the field might be weak, and testing in the field is always more cumbersome than testing in the lab. If all cables are connected, please perform the check below.

3.3. InfoSpots installation and connection

Before starting testing, the equipment should be connected:

- The items configuration was done in advance (using a MikroTik Routers and Wireless Software, such as Winbox)
- Connecting the power input of the PoE to the power supply station.
- Then, the Internet Link should be provided with a SIM card from a local supplier.
- Connecting the Internet Link with the LNCC (port1) through the PoE (quadruple PoE). The cable /line from the Internet Link goes into the PoE, and one goes from the LAN to the LNCC.
- From the LNCC, out of port 3, a cable connects the society server.

3.4. InfoSpots testing

There are two ways to test the network

1. First, connect the Internet Link to the power through a PoE. The Internet Link will give a green light to indicate the electricity received. By connecting the Internet Link to a laptop (Windows Laptop) and then opening an Internet browser to check whether it provides Internet.

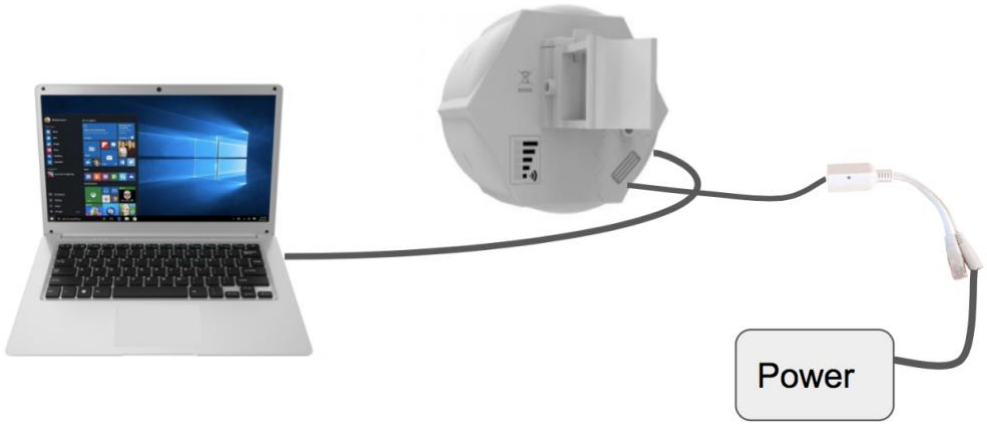

Figure 11: Internet Link connected to a Windows laptop for testing

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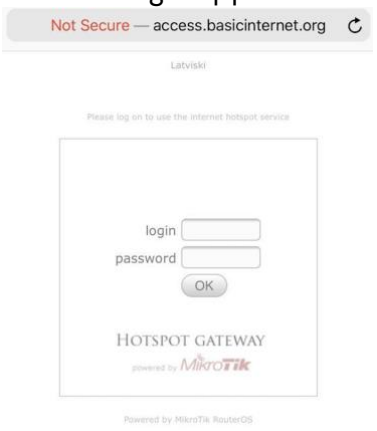
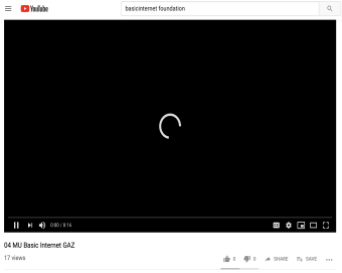
2. In case there is no laptop available for the testing process, connect the Internet Link and the local Internet control centre (LNCC) to the power. Then, you could connect the LNCC (port 1) to the Internet Link (LTE) and check with a smart mobile / tablet whether it sends Wi-Fi.

Table 1: End-to-end testing plan

Nr	Type of testing	Expected result	Result date/sig
1.1	End-to-end testing: Connect to Wi-Fi "BasicInternet"	Open Wi-Fi and see "BasicInternet"	Wi-Fi is accessible
1.2	White Listed Web pages: UiO.no BasicInternet.no Basicinternet.info Youtube.com Facebook.com (no video), LinkedIn, Twitter *Note: White list managed through FILENAME*	UiO - opens BasicInternet - opens YouTube - opens with content (no videos) Facebook, LinkedIn & Twitter - open, no videos	UiO, BasicInternet, Wiki - open Basicinternet.info - not accessible YouTube, Facebook, and Twitter -open just content without videos LinkedIn - opens with videos
1.3	WhatsApp app (on the mobile phone)	Access to the text and picture messages.	Access to the app with pictures and videos - no calls
1.4	Black-listed Web pages: http://vg.no	Voucher login appears: 	The login page appears
1.5	Black-listed Web pages: Facebook video: https://www.facebook.com/wizaraafyatz/videos/234649980548670/ (or select video after https://www.facebook.com/wizaraafyatz) YouTube video: LINK (https://www.youtube.com	YouTube: page opens, but Video does not load, is spinning	YouTube, Facebook videos aren't accessible. 

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	/watch?v=1HMd66hLAr8)		
1.6	WhatsApp videos	No videos or video calls	Full access to the content (pictures and videos)

Table 2: LTE and LNCC testing

Nr	Type of testing	Expected result	Result date/sig
2.1	LTE testing (make sure to insert SIM card):	After connecting the LTE with the power and LNCC should indicate green lights (power and PoE)	When using double PoE LTE shows green lights,
2.2	Connect cable from LTE to PC Open Network preferences, connect to network (wired)	Full access to the network	Access to the network as shown in table 1
2.3	Connect cable from LTE into port 1 of LNCC (without PoE) Use Mobile Phone, tablet or PC to connect to "BasicIntenet"	Connection to "BasicInternet" successfully	No network
2.4	Perform the test 1.2 .. 1.5	Results as above	No accessibility

Notes:

- 2.1 Light indicators:
    a) If both lights are green, that means there is a connection and receiving signals
    b) If one light is red, that indicates: either no SIM card inserted or signals aren't available/received

Figure 12: Difference between the LTE light indicators

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4. InfoSpots Use

Once the connection is established, the InfoSpot is ready to be used. Please use your phone, tablet or PC to search for the Wi-Fi called "BasicInternet". Once you connect, you should get to the login page (Figure 13). To achieve access, click on "Free Internet Access" and you get to Internet Lite - the Internet without videos[1].

If you are not automatically connected, type: access.basicinternet.org into your browser to get to Figure 13. After clicking on "Free Internet Access" or on "Yeboo School Server", you get to the page Yeboo.com. Yeboo.com is the welcome page on the local minicomputer, which often is a Raspberry Pi (RPI). We selected a local computer to make access to information free of charge for everyone. That means everyone can connect to Yeboo.com once you are connected to Wi-Fi.

Figure 13: Login page when accessing the InfoSpot

The whole setup is given to you to help yourself in a) establishing Web pages, b) sharing content in the community.

a) Web pages are established using Wordpress, the number 1 tool to create websites. You can contribute through http://Yeboo.com/wp-admin with user guest and password BasicInternet. Administrators have a separate login to be able to modify the setup.

b) Sharing of content is done through a local cloud called "Nextcloud", available as http://Yeboo.com:8080 or through the link from http://Yeboo.com - You find, including but not limited to courses on energy, developed as part of the SESA project, and Administrators can establish user groups and download files and videos.

To access videos on the Internet, you need to buy/get a voucher. Vouchers are provided by the

[1] If you need to gain full access to the Internet, including videos, please ask for a voucher.

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administrator[2]. The reason is that we work with 10 or 20 Gigabyte (GB) data bundles from mobile operators. As one hour of video is about 1 GB, 10 GB can be quickly consumed in everyday life.

5. Administration of the InfoSpot

These are the following types of users:

- **End users**, who connect to the InfoSpot using Wi-Fi and can have access to the InfoSpot (referring to section 4 "InfoSpot use" of this document).
- **InfoSpot owners**, who help the users as "Digital Friends" and find ways in establishing business (where possible). InfoSpot owners can also download files and directories from http://Yeboo.BasicInternet.org, and install them on their local Society server.
- **Regional Competence Centres (RCCs)**, who help in configuration and installation of the equipment. In addition to the full set of information, they also get access to the configuration files, and last but not least, real-life experience in connecting the future.

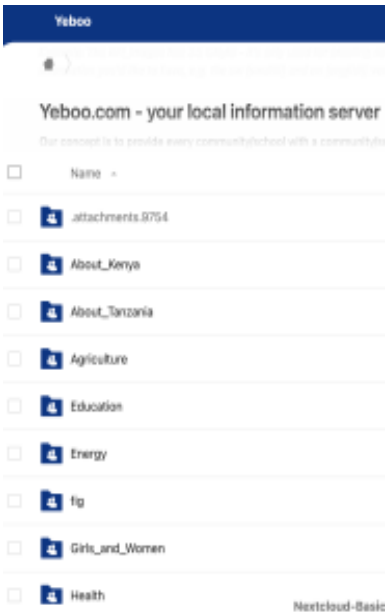

Figure 14: InfoSpot server (Yeboo.com) content

5.1. InfoSpot owners' access

Yeboo.com is the local server, which is typically a Raspberry Pi[3].

As an InfoSpot owner, you can change both the first page as well as add other files to be shared with your community. The first page is done in **Wordpress**[4], which is the #1 software for creating

[2] Access to the full Internet with videos needs a voucher access, starting from access.basicinternet.org
[3] Please set the IP address of the server to be static: 192.168.1.20
[4] You start administration of Wordpress through http://Yeboo.com/wp-admin with admin, BasicInternet1084

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web pages. More about it can be found in "About_Wordpress.md" at the link http://Yeboo.com:8080 under ICT_Communications on your local RPI, or at http://Yeboo.BasicInternet.org.

Nextcloud is a local cloud on your Raspberry Pi, allowing you to share files and videos within your community, create common folders, groups and a log more. The normal login is guest "BasicInternet" the admin login is admin "BasicInternet1084".

5.2. Creation of Vouchers

As an InfoSpot owner, you can create vouchers for access to the complete Internet. Our recommendation is to make the vouchers as easy as possible, e.g. 4 characters as username and as passwords. See how to create vouchers on http://Voucher.BasicInternet.no

To create the vouchers can be created through http://Vouchers.BasicInternet.org; you can ask your Regional Competence Centre (RCC) or info@basicInternet.org for the access rights.

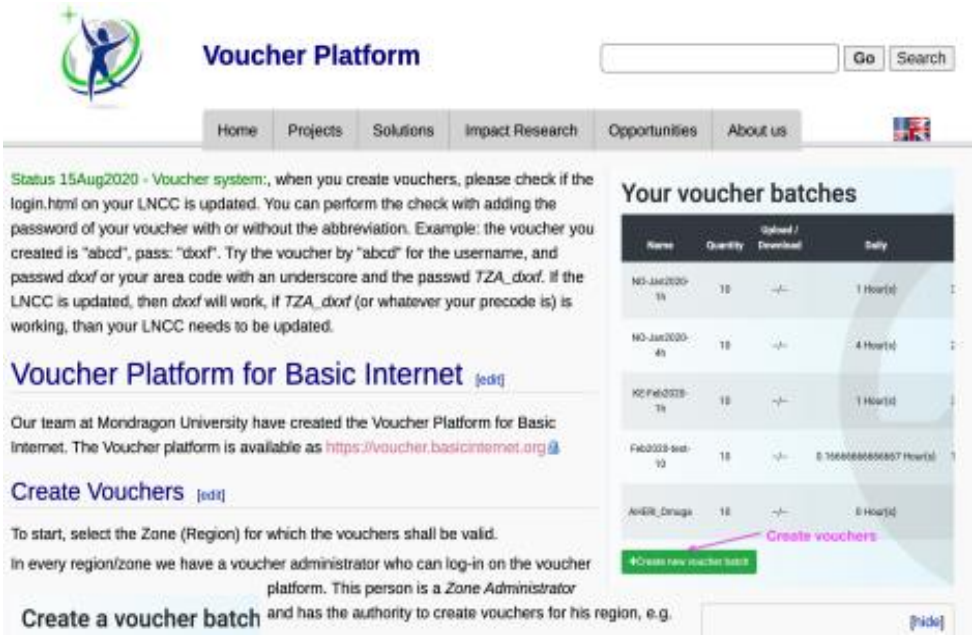

Figure 15: InfoSpot voucher platform

5.3. Definition of Regional Competence Centres (RCCs)

Regional Competence Centres (RCCs) are locally operated and maintained hubs established by the Basic Internet Foundation. Their core mission is to provide communities, especially in low-bandwidth and underserved regions, with affordable and sustainable access to digital information and services.

RCCs function as the physical and operational backbone of the Foundation's model, delivering three key components:

A. **Infrastructure:** They deploy and manage low-cost, solar-powered Wi-Fi hotspots that broadcast a Free Basic Internet signal, providing free access to essential text-based information, e-learning platforms, and e-health services.

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B. **Capacity Building:** They act as training centres, building local digital skills and empowering community members to create, manage, and utilize digital content relevant to their needs.

C. **Local Ecosystem Catalysts:** RCCs foster a sustainable digital ecosystem by collaborating with local partners (e.g., universities, NGOs, governments) to host and distribute localized content, ensuring the information is valuable, accessible, and drives social and economic development.

In essence, an RCC is not just an internet access point; it is a community-driven engine for digital inclusion, knowledge sharing, and sustainable development.

6. Safety Precautions

When establishing, operating, or maintaining an InfoSpot, it is essential to prioritize safety to protect the users first, but also the equipment. Follow these safety guidelines:

6.1. Electrical Safety

- **Power Supply**: Ensure the power supply matches the voltage and current requirements of the equipment (e.g., PoE adapter for the LTE antenna requires 1.2 A, while the LNCC requires 0.8 A). Using incorrect power supplies can damage the equipment or pose a fire hazard.
- **Cable Management**: Keep cables organized and secure to prevent tripping hazards or accidental disconnections. Avoid placing cables in high-traffic areas.
- **Moisture Protection**: Protect all electrical components from moisture and rain, especially when installing outdoor equipment like the LTE antenna.

6.2. Equipment Handling

- **SIM Card Installation**: Ensure the SIM card is inserted correctly and without force. A damaged SIM card slot can render the LTE antenna unusable.
- **Antenna Placement**: When installing the LTE antenna on a rooftop, pole or elevated structure, use appropriate mounting hardware and proper fall-protection equipment. Avoid installing the antenna near electrical lines, lightning conductors, or metallic structures that may cause interference or pose electrocution risks. Maintain safe distances from power cables and follow local building codes and safety regulations. Once installed, ensure the structure is stable and can withstand wind and vibrations or other environmental factors, and verify that cabling is properly fastened to avoid movement or wear over time.
- **Heat Dissipation**: Place the LNCC and Raspberry Pi in a well-ventilated area to prevent overheating. Avoid covering these devices with objects that could block airflow.

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6.3. User Safety

- **Public Awareness**: Clearly mark the InfoSpot area to inform users of the equipment and its purpose. Provide basic instructions for safe use.
- **Child Safety**: If the InfoSpot is accessible to children, ensure all cables and equipment are out of reach or securely covered to prevent tampering.

6.4. Emergency Procedures

- **Power Off**: In case of equipment malfunction, power off the device immediately and seek assistance from a qualified technician.
- **Fire Safety**: Keep a small fire extinguisher nearby if the InfoSpot is located in a high-risk area (e.g., near flammable materials).

7. Routine Maintenance Practices

Regular maintenance ensures the longevity and optimal performance of the InfoSpot. Follow these practices:

Daily Checks

- **Power Indicators**: Verify that all devices (LTE antenna, LNCC, Raspberry Pi) display the correct power and connectivity indicators (e.g., green lights).
- **Wi-Fi Connectivity**: Confirm that the "BasicInternet" Wi-Fi network is active and accessible to users.
- **Local Server**: Check that Yeboo.com and Nextcloud are operational by accessing them through a connected device.

Weekly Checks

- **Cable Inspection**: Examine all cables for wear, fraying, or damage. Replace any compromised cables immediately.
- **Equipment Cleanliness**: Dust off the LNCC, Raspberry Pi, and other components to prevent overheating. Use a dry or slightly damp cloth for cleaning.
- **Signal Strength**: Use the Network Cell Info Lite app to monitor the LTE antenna's signal strength. If the signal weakens, consider adjusting the antenna's position or elevation.

Monthly Checks

- **Software Updates**: Update the Raspberry Pi's operating system, Wordpress, and Nextcloud to the latest versions to ensure security and performance improvements.
- **Data Usage**: Review data consumption to ensure the InfoSpot remains within the allocated data bundle. Adjust voucher distribution if necessary to manage bandwidth.
- **Backup Data**: Backup all critical data stored on the Raspberry Pi (e.g., Wordpress

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content, Nextcloud files) to an external drive or cloud storage.

Annual Checks

- **Hardware Inspection**: Perform a thorough inspection of all hardware components, including the LTE antenna, LNCC, and Raspberry Pi. Replace any aging or malfunctioning parts.
- **Community Feedback**: Gather feedback from users to identify any recurring issues or desired improvements for the InfoSpot.

8. Troubleshooting Common Issues

Below are solutions to common problems that may arise with the InfoSpot:

a. No Internet Connectivity

- Issue: The LTE antenna shows a red light or no signal.
    - Solution:
        1. Verify the SIM card is inserted correctly and has no PIN code.
        2. Ensure the PoE adapter is providing power.
        3. Check the antenna's direction toward the nearest tower using the Network Cell Info Lite app.
        4. Test the SIM card in a mobile phone to confirm it has active data service.

b. Wi-Fi Network Not Visible

- Issue: Users cannot detect the "BasicInternet" Wi-Fi network.
    - Solution:
        1. Restart the LNCC by unplugging and replugging the power supply.
        2. Ensure the LNCC's Wi-Fi settings are correctly configured (e.g., SSID is "BasicInternet").
        3. Check for interference from other Wi-Fi networks and adjust the LNCC's channel settings if necessary.

c. Slow Internet Speed

- Issue: Users experience slow loading times or buffering.
    - Solution:
        1. Limit the number of connected devices to reduce bandwidth congestion.
        2. Prioritize traffic for essential services (e.g., Yeboo.com) using the LNCC's QoS (Quality of Service) settings.
        3. Verify the LTE antenna's signal strength and reposition it if needed.

d. Yeboo.com or Nextcloud Unavailable

- Issue: Users cannot access the local server.

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- Solution:
    1. Restart the Raspberry Pi by unplugging and replugging its power supply.
    2. Check the Ethernet cable connecting the Raspberry Pi to the LNCC.
    3. Log in to the Raspberry Pi via SSH (if configured) to diagnose server issues.

e. Voucher Login Failures

- Issue: Users cannot log in with vouchers.
    - Solution:
        1. Confirm the voucher system is active by accessing http://Vouchers.BasicInternet.org.
        2. Ensure the voucher credentials are entered correctly (case-sensitive).
        3. Contact the Regional Competence Centre (RCC) to verify voucher validity.

f. Equipment Overheating

- Issue: The LNCC or Raspberry Pi feels excessively hot.
    - Solution:
        1. Power off the device and allow it to cool.
        2. Relocate the equipment to a cooler, well-ventilated area.
        3. Consider adding a small fan or heat sink to improve airflow.

If problems persist after troubleshooting, contact the Regional Competence Centre (RCC) or email info@basicInternet.org for further assistance.

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About SESA

SESA is a collaborative project between the European Union and nine African countries (Kenya, Ghana, South Africa, Malawi, Morocco, Namibia, Tanzania, Rwanda, and Nigeria) that aims at providing energy access technologies and business models that are easily replicable and generate local opportunities for economic development and social cohesion in Africa.

Through a series of local living labs, the project facilitates the co-development of scalable and replicable energy access innovations tested, validated, and later replicated throughout the African continent. These solutions included decentralised renewables (solar photovoltaics), innovative energy storage systems including the use of second-life electric vehicle batteries, smart microgrids, waste-to-energy systems (biomass to biogas), climate-proofing, resilience and adaptation, and rural internet access.

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