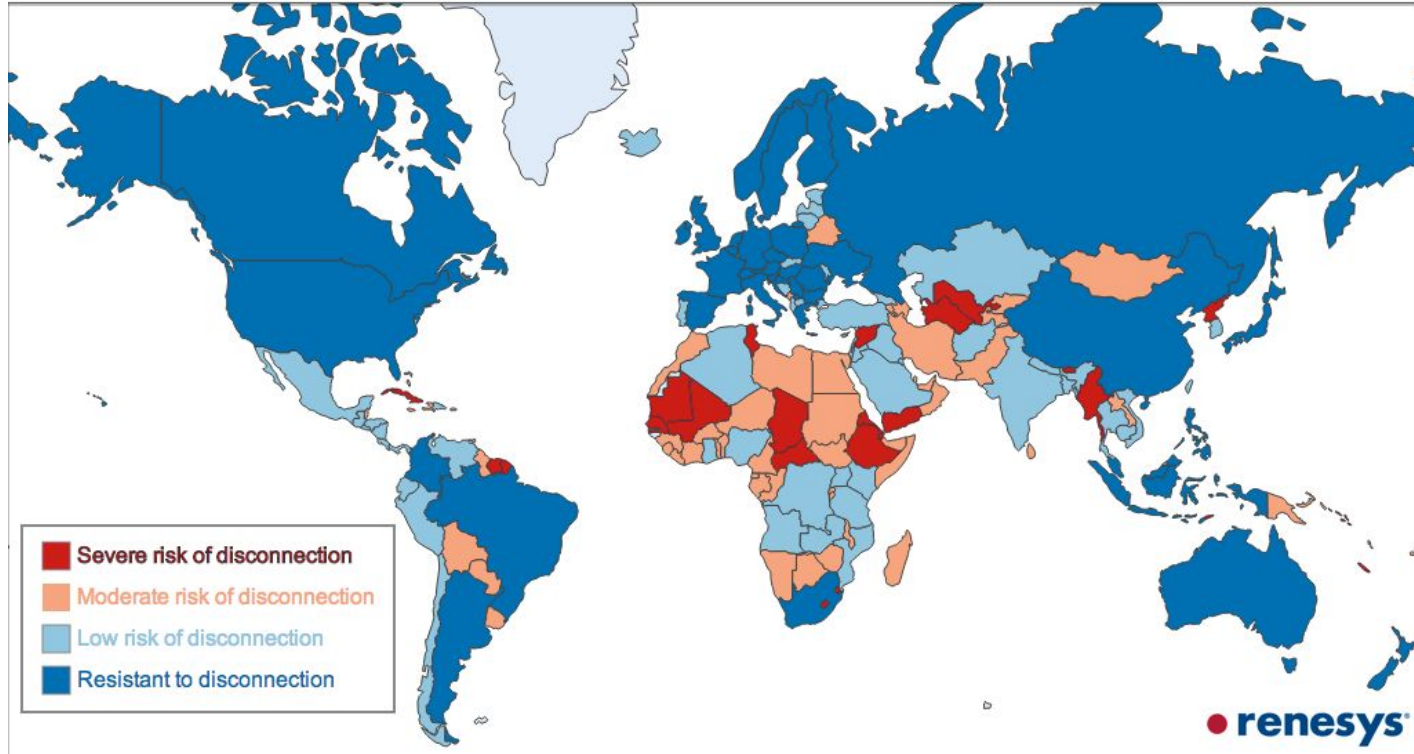# Pibox installer

Turn a Raspberry Pi into a WiFi hotspot
&
deliver offline content

Problem : 4 bn people without internet access

National Internet Diversity at the International Frontier - February 2014

Severe risk of disconnection
Moderate risk of disconnection
Low risk of disconnection
Resistant to disconnection

renesys

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https://www.vox.com/a/internet-maps

KIVIX

KIWIX

Solution

- Locally stored content
- On a local network
- Kiwix & Ideascube

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KIWIX

DÉCOUVRIR Vikidia

The encyclopedia for 8 to 13-year-old children

DÉCOUVRIR Vikidia

De Vikidia

DÉCOUVRIR

Wikipedia

Desde Chavacano de Zamboanga Wikipedia - El Libre Enciclopedia

DÉCOUVRIR

Wîkîpediya

Ji Wîkîpediya, ensîklopediya azad.

APPRENDRE

Wikiquote

The free quote compendium.

APPRENDRE

Wikiquote

De Wikiquote, la colección libre de citas y frases célebres.

DÉCOUVRIR

Wikivoyage

De Wikivoyage

français (fr)   **Changer**

Bibliothèques Sans Frontières
Libraries Without Borders

Use it !

- Download

- Plug SD card in to computer

- Launch program & choose content

- Run installation

- *Voilà!*

File	
Pibox name :	pibox
Open WiFi	
Timezone :	UTC
Build path :	(Aucun)
Output :	SD card / File
SD card :	Refresh
Free space :	- 2.0 GB
Static content	Select
KA Lite :	☐ French (10.0 GB) ☐ English (39.0 GB) ☐ Spanish (18.0 GB)
Run installation	

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Languages

Albanian
Arabic
Central Kurdish
Chavacano
English
esp
French
German
Greek
Kurdish
Multiple languages
Pashto
Persian
Polish
Portuguese
Rundi
Russian
Serbian
Spanish
Swahili
Tigrinya
unkown language

Available

Name	Size	Description
Cuentos	103.83 MB	este paquete contiene videos de cuentos infantiles para no dormir.
Historia	183.42 MB	este paquete contiene videos sobre las invasiones y las primeras migrac
Matemáticas	92.38 MB	Video educativa sobre las matemáticas.
Wikipedia	191.74 MB	The free encyclopedia
Wikipedia	232.75 MB	Desde Chavacano de Zamboanga Wikipedia - El Libre Enciclopedia
Wikipedia	206.64 MB	Jóge Wikipedia
Βικιβιβλία	211.8 MB	Από Βικιβιβλία
Βικιεπιστήμιο	195.68 MB	Από Βικιεπιστήμιο
Βικιθήκη	280.12 MB	Από Βικιθήκη

Selected

Name	Size	Description
Bouquineux	5.31 GB	2500 livres numériques gratuits et libres de droits
Wîkîpediya	354.12 MB	Ji Wîkîpediya, ensîklopediya azad.
Wiktionary	401.81 MB	Ji Wiktionary
Βικιλεξικό	391.6 MB	Από Βικιλεξικό

Free space : 111.57 GB

Done

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KIWIX

How it works

On the raspberry pi :

- Ideascube

- Kiwix-serve

- Third party applications
    - KA-lite
    - Aflatoun (planned)
    - Wikifundi (planned)

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Ideascube

- django server
- used and funded by BSF (Library Without Border)
- contains administrator interface
- build in applications :
  - media center
  - blog
- manage ZIM using kiwix-serve

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How the installer works

- Python application
- GTK for the graphic interface
- Packaging:
    - Pyinstaller (we had to fixed to GTK packaging of pyinstaller)
    - QEMU emulator:
        - compiled statically on linux
        - available binaries on windows
        - bundling dynamic libraries on macos

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Installation process

- Download Raspbian lite image
- Resize the image with qemu-img
- Emulate the raspberry pi with QEMU

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QEMU emulation

- Raspi2 machine exist but is not complete
    - boot old version of raspbian and windows
    - no USB controller thus no keyboard / mouse / network
- Versatile express machine :
    - ARMv7
    - Specific Kernel compiled for Versatile express
        - `make ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf- vexpress_defconfig`

QEMU emulation - communication

- SSH is not activated by default in raspbian lite (since not that long)
- an empty file named ssh in /boot activates it
    - requires to mount the partition
- or use stdin and stdout to activate SSH
- Then we connect by SSH

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Installation process

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- Emulate the raspberry pi with QEMU

Inside emulation
- Resize partition : `fdisk ...`
- Resize file system : `resize2fs ...`
- Install Ansible
- Launch Ansiblecube playbook

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Ansiblecube

- Made by BSF for deployment
- layer on top of shell script
- yaml rules

```
- name: Copy nginx vhost
  template: src=aflatoun.vhost.j2 dest=/etc/nginx/sites-available/aflatoun
  tags: ["custom"]

- name: Nginx enable Virtual host
  file: src=/etc/nginx/sites-available/aflatoun dest=/etc/nginx/sites-enabled/aflatoun state=link
  notify: restart nginx
  tags: ["custom"]
```

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Installation process

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Inside emulation
- Resize partition : `fdisk ...`
- Resize file system : `resize2fs ...`
- Install Ansible
- Launch Ansiblecube playbook
- Write ideascube configuration

- Write image to SD card

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