



## Upcoming Features in GNU Health 2.8

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# About GNU Solidario



GNU Solidario first project :Santiago del Estero, Argentina, 2006

*Delivering Health and Education with Free Software*

## **GNU Health**

The Free Health and Hospital Information System.  
([health.gnu.org](http://health.gnu.org))

## **IWEEE**

International Workshop on E-Health in Emerging Economies.  
([www.iweee.org](http://www.iweee.org))



**If** Health care is a **Public Good**  
**Why** is it **ruled** by **corporations** and  
**private** software ?



# Social Medicine and Social Determinants of health



# Social Diseases

## Social Diseases

They are the **result** of **inequalities** in our societies

Greed, **corruption** and complete **lack of empathy**



# Over 20000 Children die every day from Social Diseases



Contaminated Water

Malnutrition

Cholera

Drug abuse

Prostitution

Chagas

Tuberculosis

Child Labour

War

Family Violence

Kala Azar

Malaria

HIV

Ebola ...

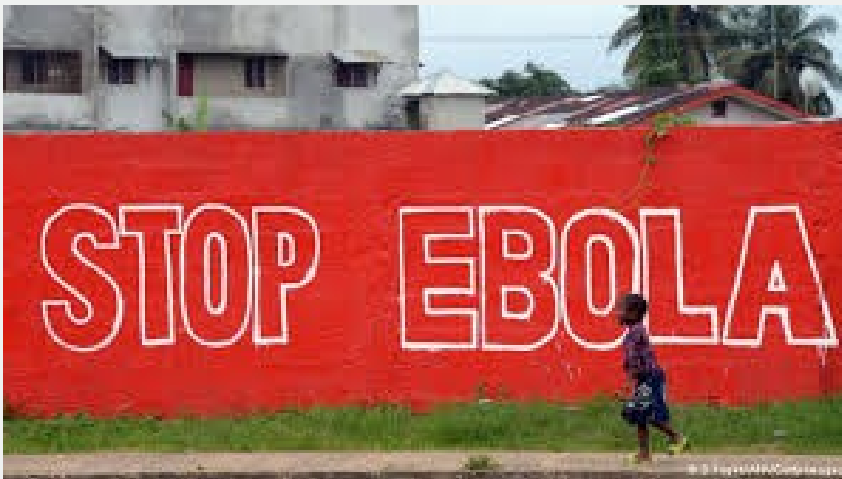


# Tuberculosis and Ebola are Social Diseases

*“Many people have asked me why the outbreak of Ebola virus disease in West Africa is so large, so severe, and so difficult to contain. This questions can be answered with a single word : **Poverty**”*

Dr. Margaret Chan  
Director General WHO, Geneva

Source: New England Journal of Medicine, sept  
25th, 1014



# Saah Exco : The voice to the voiceless



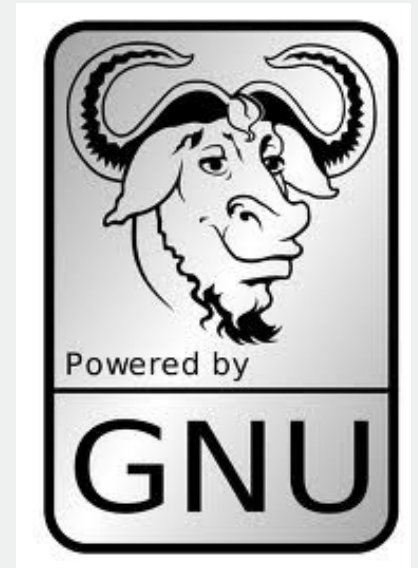
Saah Exco, a 10-year-old child victim of EVD in Liberia, surrounded by bystanders, dies in solitude



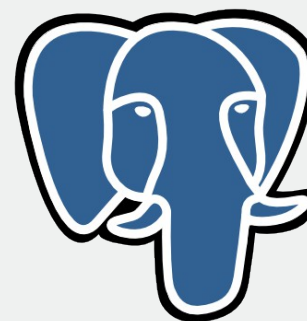
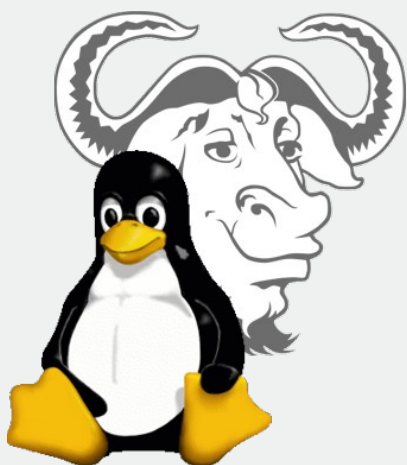
# GNU Health = Free (Freedom) Software

## GNU Health is Free Software

- Freedom to **run** the system
- Freedom to examine and **adapt** it to YOUR needs
- Freedom to **improve** it and send your contributions to the **benefit community**
- Freedom to **re-distribute** the source code



# GNU Health relies on Free Technology



PostgreSQL

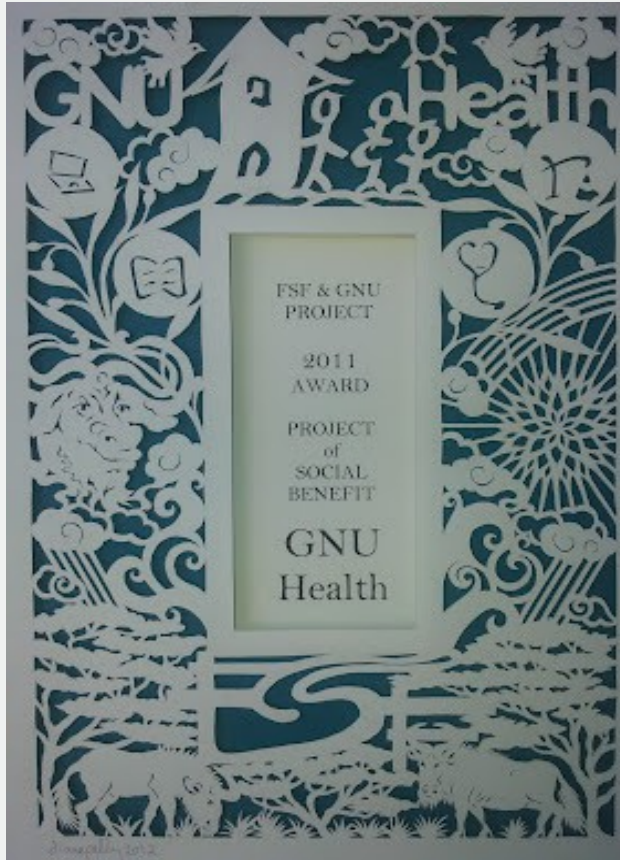


# GNU Health : Modularity and Interoperability

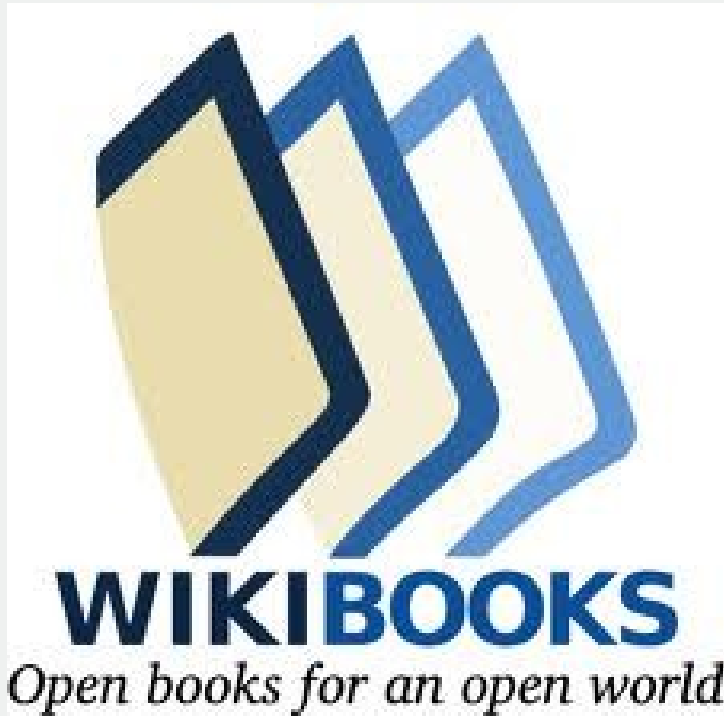
## GNU Health Modular Design



# FSF Best Project of *Social* Benefit



# Communitary Development Environment



Source code, mailing lists, bugs  
GNU Savannah



# Functionality Areas



## Person & Community

Demographics, Socioeconomics, Domiciliary Units,

## Patient Level

Evaluations, Genetics, prescriptions, History, surgeries...

## Health Center Level

Hospitalizations, Finances, Billing, Laboratory, stock .....

## Health Government Level

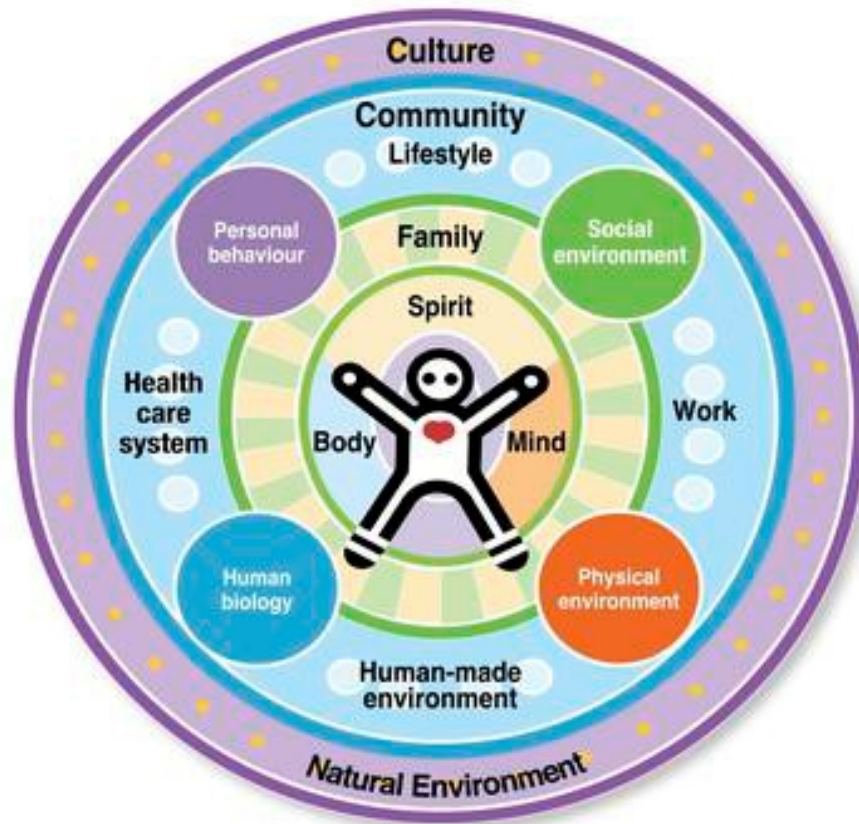
Epidemiology, OLAP, reporting

GNU Health : The Free Health and Hospital Information System





# GNU Health : People before Patients

GNU Health promotes the proactive Primary Care "System of Health" (people) instead of the traditional "System of Disease" (patients)



# Empowering the person, family and community

	<p><b>Name :</b> Betz, Ana</p> <p><b>DoB :</b> 1985-10-04</p> <p><b>Blood Type :</b> A +</p>	<p><b>55567890</b></p> 
<b>Female</b>	<b>Universal Person Identifier</b>	

Socioeconomics  
Education  
Lifestyle: Sexuality / Physical activity / addictions ..  
Nutrition  
Housing and working conditions  
Medical History  
...



Family Members and their roles  
Family Affection / Functionality Level  
Domiciliary Units conformants  
Contacts info : **Key for quickly locating them in outbreaks**  
Family History / Genetics  
...



**GNU Health promotes transdisciplinary work, and makes the person an active member of the system of health**



## What is new in upcoming 2.8 ?



# Tryton 3.4 Compatibility



Current modules	Added modules in 2.8
account	stock_lot
account_invoice	purchase
account_product	account_invoice_stock
calendar	stock_supply
company	
country	
party	
product stock	



# Think Big



# Think BIG

Large hospitals

Large networks of health institutions (countries)

Big data aggregation

Synchronization



# HL7 support - FHIR



# UUID for parties

party code field

*“GNU Hospital - 590f4f32-af75-4f1e-8891-1b4843a37a1e”*



# Immunization Decision Support

Automatic check

Warnings on initial and booster doses

Based on WHO pediatric schedule

Easy to localize to local country  
schedules

Immunization reports





# Demographics

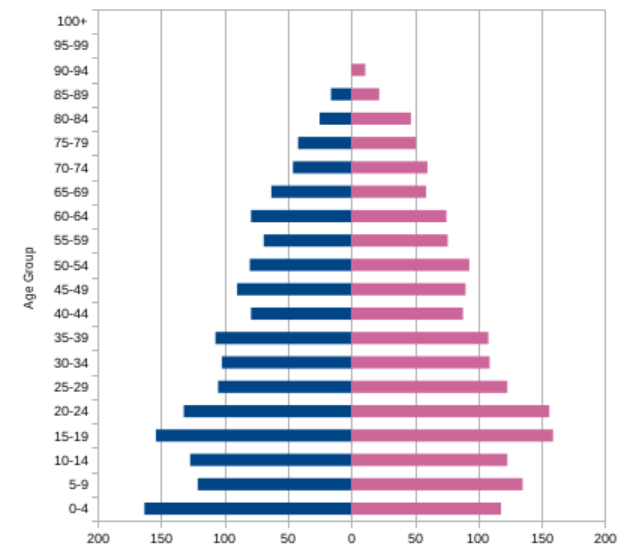
- Birth certificates
- DeathCertificate()
- Improved reporting
- Better role segmentation

Print Date: 10/11/2014 at 18:57:01

## GNU Health Summary Report

### Population Pyramid

	♀	♂	Σ
Population	2131	1998	4129



# Enhanced DSS on disease groups

Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]

Patients

Main Info

BETZ, ANA Female Age: 29y 2m 3d PAC001

Critical Information

Personal history of allergy to penicillin  
Personal history of allergy to anaesthetic agent

Other critical info, not encoded in diseases / allergies. For example family violence or recent stressful events.

We can automate other patient related information to be shown at the critical info.

Automated summary of patient allergies and other critical information

General info Medication Diseases

Disease	Status of the disease
Personal history of allergy to penicillin	chronic
Personal history of allergy to anaesthetic agent	chronic
Leptospirosis	healed

tryton://localhost:8000/admin/model/gnuhealth.patient/1/views=%5B215

Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]

Diseases

Record saved! 1 / 108

Main Genetics Extra Info

Name: Respiratory tuberculosis, bac Code: A15 Main Category: I Certain infectious an

Groups

Group
NOTIFIABLE
RESPIRATORY
INFECTIOUS
SOCIAL AND FAMILY

Specify the groups this pathology belongs. Some automated processes act upon the code of the group

For example, it could automatically notify the Ministry of Health depending on the disease group.



# Enhanced Health Services integration

Administrator - GNU SOLIDARIO HOSPITAL [Euro]      Waiting requests: 0 received - 0 sent      admin@localhost:8000/health20rc1

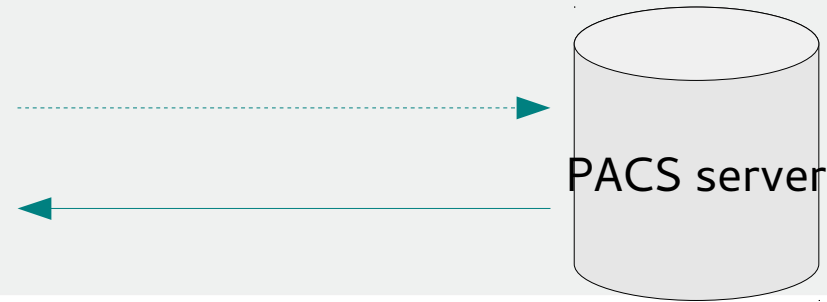
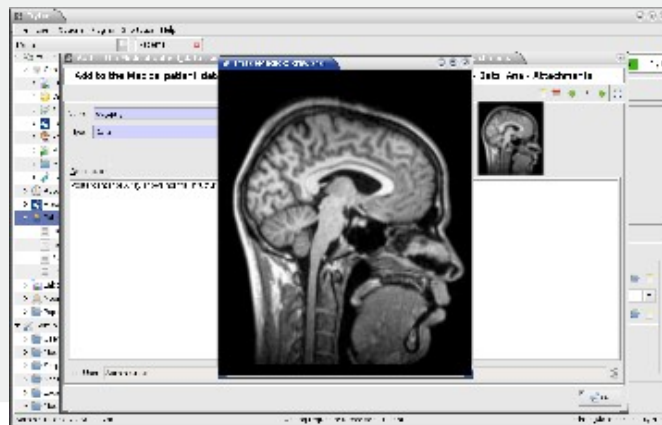
Warn	Excluded	Analyte	Value	Result - Text	Lower Limit	Upper Limit	Units	Remarks
<input type="checkbox"/>	<input type="checkbox"/>	Hemoglobin	12.00		11.00	16.00	g/dL	
<input type="checkbox"/>	<input type="checkbox"/>	RBC	4.50		3.50	5.50	10 <sup>6</sup> /μL	
<input type="checkbox"/>	<input type="checkbox"/>	HCT	39.00		37.00	50.00	%	
<input type="checkbox"/>	<input type="checkbox"/>	MCV	83.00		82.00	95.00	fL	
<input type="checkbox"/>	<input type="checkbox"/>	MCH	28.00		27.00	31.00	pg	
<input type="checkbox"/>	<input type="checkbox"/>	MCHC	33.00		32.00	36.00	g/dL	
<input type="checkbox"/>	<input type="checkbox"/>	RDW-CV	13.00		11.50	14.50	%	
<input type="checkbox"/>	<input type="checkbox"/>	RDW-SD	40.00		35.00	56.00	fL	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	WBC	13.00		4.50	11.00	10 <sup>3</sup> /μL	Patient with bacterial pneumonia
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NEUK	75.00		40.00	70.00	%	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	LYMK	22.00		20.00	45.00	%	
<input type="checkbox"/>	<input type="checkbox"/>	MON%	5.00		2.00	10.00	%	
<input type="checkbox"/>	<input type="checkbox"/>	EOS%	3.00		1.00	6.00	%	
<input type="checkbox"/>	<input type="checkbox"/>	BAS%	0.00		0.00	2.00	%	

Service templates

Automatic addition from different health sectors to service model

GNU Health

ORTHANC



Can store the image, metadata or DICOMDIR location



# Injury Surveillance System

Thanks to Jamaica MoH !

Records violent injuries  
(accidents, robberies, self  
harm, ... )

Georeferenced

ICD 10 encoded

Contextual information (place,  
time, subjects involved, ... )

The screenshot shows a web application window titled 'Domiciliary Units'. The interface includes a menu bar (File, User, Options, Favorites, Help) and a toolbar. The main content area is divided into several sections:

- Form Fields:** Includes fields for Code (Valse-LeonyCastillo), Desc (House by the city town hall), Street (Leon y Castillo), Number (1), Apartment, District, Municipality (Valsequillo), City, Zip Code (35217), Country (Spain), and Province (Las Palmas).
- Coordinates:** Latitude (27.99189100000000) and Longitude (-15.49462800000000).
- OSM Map:** A map showing the location of the unit in Valsequillo, Las Palmas. The map URL is <http://openstreetmap.org/?mlat=27.9918910000000&mlon=-15.4946280000000>.
- Infrastructure:** Fields for Material (Concrete), Roof (Concrete), Bathrooms (2), Running Water (checked), Gas supply (unchecked), and Telephone (checked).
- Members Table:**

Code	Name	Last Name	SSN
2	Ana	Betz	55567890
5	John	Zenón	40556644
4	Matt	Zenon Betz	97234436

At the bottom of the window, there is a status bar with the text: 'Administrator - GNU SOLIDARIO HOSPITAL [Euro]', 'Waiting requests: 0 received - 0 sent', and 'admin@localhost:8000/health2Orc1'.

Georeferencing with OpenStreetMap



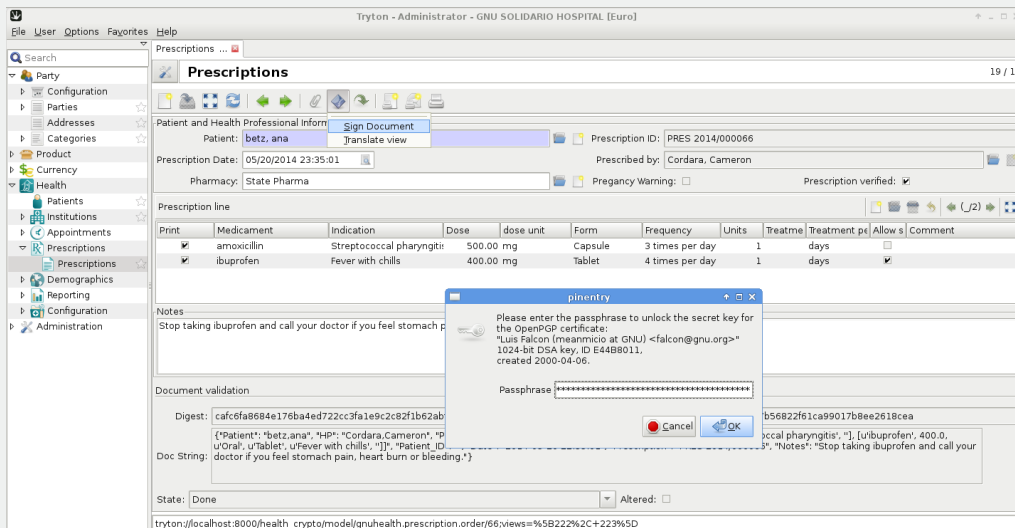
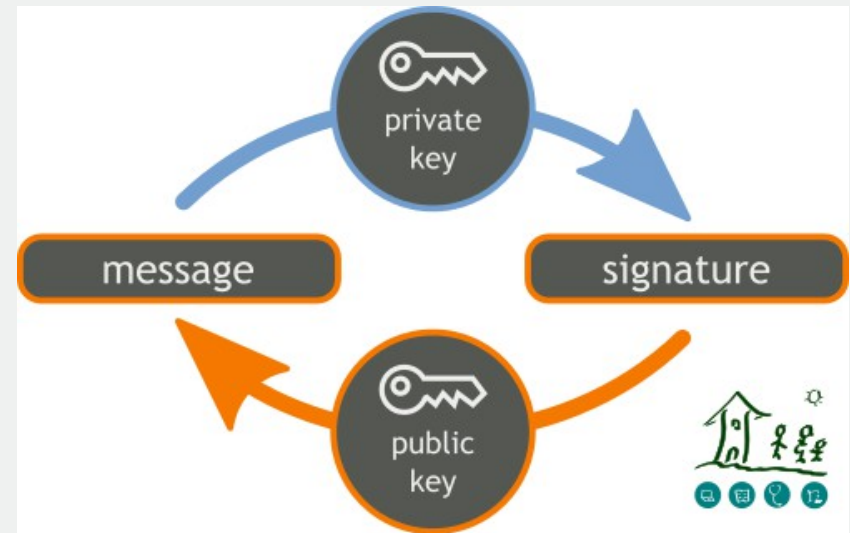
# Additional models in Health Crypto

Digitally sign documents and medical acts

GNU Privacy Guard (GNUPG) Integration

Authenticity, accountability & non-repudiation

Document validation



Prescriptions

Evaluations

Birth and death certificates

...



# ./gnuhealth-update

Update manager

Critical Patches

Large  
installations

Can be run non-  
interactively

```
Terminal
File Edit View Terminal Tabs Help
usage: gnuhealth-update command [options]

Command:

  version : Show version
  backup  : Backup the gnuhealth kernel, attach dir and database
  install : Download and install the patches

Options:

--nobackup : Don't do a backup previous to the update.
--backupdest : destination of the backup file
--dry-run  : Check, download and preview, but don't actually update process
--database : database name to use with the install or backup command

lfm@beastie:~/health/tryton $
```



# ./serverpass

```
usage: serverpass.py [-h] [-c CONFIG]

optional arguments:
  -h, --help            show this help message and exit
  -c CONFIG, --config CONFIG
                        Specify alternative Tryton configuration file
```

Harden security at installation level (**cracklib**)

Integrated in the installation script `gnuhealth-install.sh`

Can be used as a stand-alone process



## "Custom" directory for local modules

```
lfm@beastie:~/gnuhealth/tryton/server/modules $ ls
custom ←
health
health_archives
health_calendar
health_crypto
health_genetics
health_gyneco
health_history
health_icd10
health_icd10pcs
health_icpm
health_icu
health_imaging
health_inpatient
health_inpatient_calendar
health_lab
health_lifestyle
health_mdg6
health_ntd
health_ntd_chagas
health_ntd_dengue
health_nursing
health_pediatrics
health_pediatrics_growth_charts
health_pediatrics_growth_charts_who
health_profile
health_qrcodes
health_reporting
health_services
health_socioeconomics
health_stock
health_surgery
health_who_essential_medicines
trytond_account-3.2.0
trytond_account_invoice-3.2.0
trytond_account_invoice_stock-3.2.0
trytond_account_product-3.2.0
trytond_calendar-3.2.0
trytond_company-3.2.0
trytond_country-3.2.0
trytond_currency-3.2.0
trytond_party-3.2.0
trytond_product-3.2.0
trytond_sale-3.2.0
trytond_stock-3.2.1
trytond_stock_lot-3.2.0
```





# Pootle as the Translation Platform



health.gnu.org

# GNU Health at the United Nations and World Health Organization



# GNU Health @ United Nations



UNITED NATIONS  
UNIVERSITY

UNU-IIGH

International Institute For Global Health

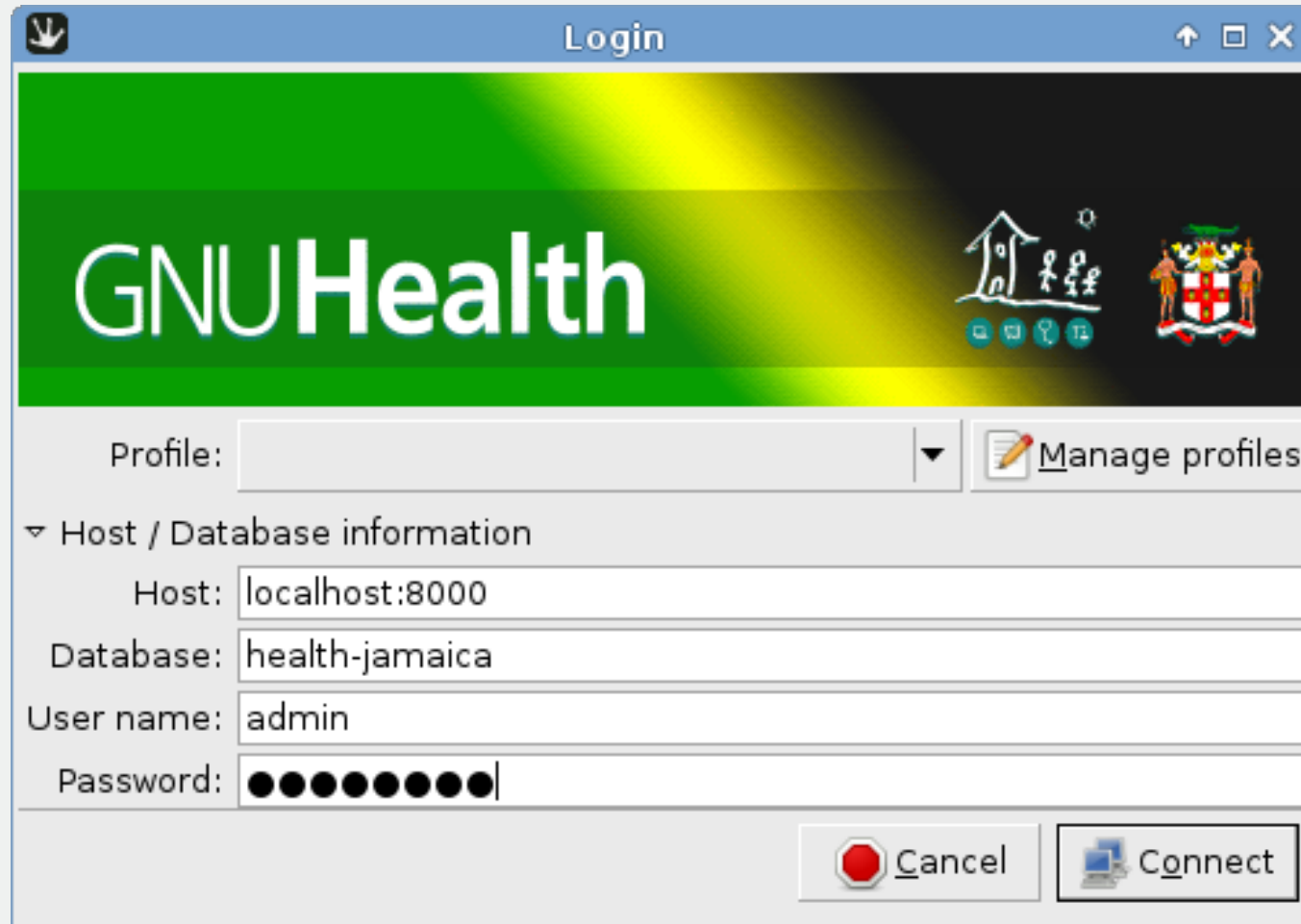
GNU Health training on the International Institute for Global Health, Kuala Lumpur, Malasia



# GNU Health @ WHO



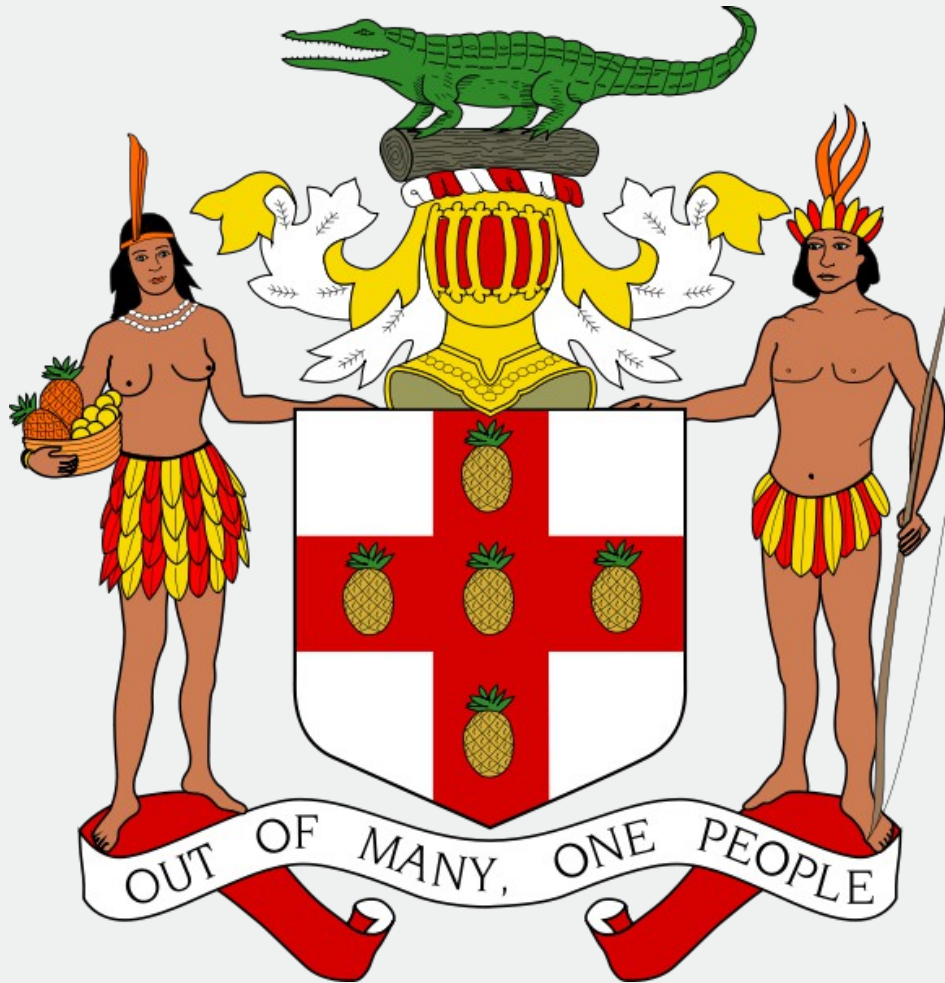
# Government of Jamaica chooses GNU Health



The image shows a screenshot of a web browser window titled "Login". The window has a blue header bar with standard window controls (minimize, maximize, close) on the right. The main content area features a green and yellow gradient background with the text "GNUHealth" in large white letters. To the right of the text are two logos: the GNU Health logo (a house with people) and the coat of arms of Jamaica. Below the header, there is a "Profile:" dropdown menu and a "Manage profiles" button with a pencil icon. A section titled "Host / Database information" is expanded, showing four input fields: "Host:" with the value "localhost:8000", "Database:" with "health-jamaica", "User name:" with "admin", and "Password:" with a masked password of ten black dots. At the bottom right of the form are two buttons: "Cancel" with a red stop sign icon and "Connect" with a blue computer icon.



# GNU Health in Jamaica Ministry of Health



# 300+ "GNU" Health facilities nation-wide



## Some GNU Health events during the period 2013 – 2014







Twitter : [@gnuhealth](https://twitter.com/gnuhealth)







Laos embraces GNU Health!  
Center of Medical Rehabilitation (CMR) in Laos for the unexploded ordnance (UXO) victims.





Tryton - TUB    Information   Schedule   Register   Contact   English   #TUB2013



# Tryton Unconference Barcelona

November 7-10, 2013  
Barcelona







health.gnu.org









**Michele E.A. Roofe** @SaintMichele37 · 55m

6th RELACSIS Meeting in Bogota Colombia this morning. Caribbean Panel: CARPHA, Belize & Jamaica. Deo Gratias!





# Join Us !

**<http://health.gnu.org>**

**IRC : #gnu-health**

**Twitter : @gnuhealth**

