

# Introduction to GNU/Linux



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# agenda

History of GNU/Linux – short remarks

Freedom of choice

Elements of a GNU/Linux system

Linux distributions – overview and closer looks

Software for Linux – what to use for what

Global Linux – localization and internationalization

URLs – further reading



# History of GNU/Linux

## Just some remarks

The GNU project was launched in 1984 to “develop a complete UNIX style operating system which is free software”.

The GNU project / Free Software Foundation developed a lot of software and the GPL license.

Richard Stallman -->



# History of GNU/Linux

## Just some remarks

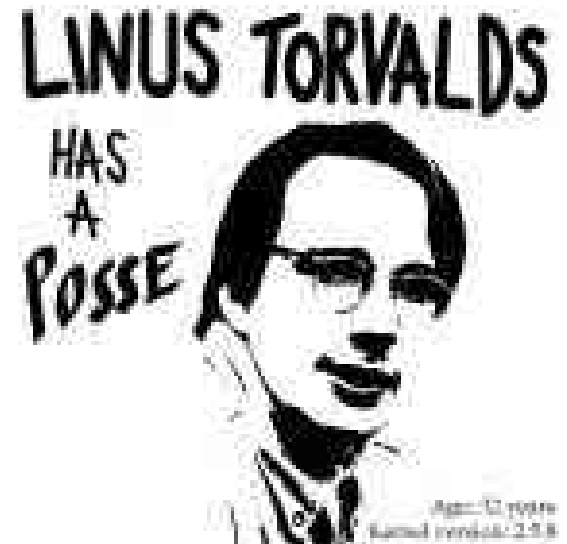
In 1991, Linus Torvalds and helpers coded the Linux Kernel and put it under the GPL license.

This Linux kernel together with lots of GNU software formed the operating system called GNU/Linux - an operating system is more than just its kernel, and software alone cannot run without a kernel.

Therefore, the short name Linux for the whole thing has been the subject of sometimes flamy discussion -

the same goes for definitions of Open Source and Free Software: OSS, FOSS, FLOSS, OSI, FSF, .....

(see URLs for further reading) (and **see the Film tonight! RevolutionOS**)



# History of GNU/Linux

## Freedom

**Free** as in *Free Speech*, not necessarily as in *Free Beer*.

The 4 freedoms, circa as formulated by the Free Software Foundation:

- ▶ The freedom to run the program (or network), for any purpose.
- ▶ The freedom to study how the program (or network) works, and adapt it to your needs.
- ▶ The freedom to redistribute copies (of software and specifications) so you can help your neighbour.
- ▶ The freedom to improve the program (or network design), and release your improvements to the public, so that the whole community benefits.

# Freedom of choice

## Reasons to choose Linux

- ▶ it is free
- ▶ it is free :)
- ▶ choice between many distributions for every type of usage
- ▶ among the best operating systems that exist
- ▶ localization potential
- ▶ good utilization of hardware
- ▶ can be made extremely small  
(embedded systems,  
dedicated wireless hardware,  
USB bootable distros, etc)
- ▶ runs well on extremely big computers (clusters, supercomputing)

# Freedom of choice

## Criteria when choosing an operating system

- ▶ usage profile, user expectations ... what do you want to do?
- ▶ the hardware available to you
- ▶ economics ... what can you spend on what?
- ▶ skills (including future skills you would like to build!)
- ▶ ... and more

# Freedom of choice

## What *might* be reasons NOT to use Linux

- ▶ Need to integrate with existing non-Linux IT environment
- ▶ Specialized use of proprietary techniques  
(e.g. Office apps, specialized businesses and applications)
- ▶ Need to educate people for existing  
non-Linux job and market environments

**Most of these reasons are irrelevant or can be made so -  
transitions can be made smooth  
and everything depends on making first steps.**

- ▶ use of Integration tools, emulators, etc
- ▶ education, awareness building



# Freedom of choice

## How to make first steps easier:

- ▶ Try LiveCDs before installing on your computer, e.g. Knoppix, Ubuntu
- ▶ Experiment! Ask! Try!
- ▶ Learn how Linux and other OSs can coexist in mixed environments or on one computer (dual boot setups)
- ▶ If you like, use a distro that *looks* like that other old system :)



# Elements of a Linux system

(not systematic or complete)

- ▶ Kernel: I/O, File systems, memory manager, process manager, ...  
The Linux Kernel is now in version 2.6.10,  
but versions 2.2. and 2.4 are still found in many places.
- ▶ File systems
- ▶ Linux command set (--> Unix)
- ▶ Graphical user interface (GUI):  
X windows  
Window managers  
Desktops: **Gnome**, **KDE**, IceWM, Fluxbox, ... and many more
- ▶ Install and update tools, versioning and package managers
- ▶ User space applications (we will come back to that)

# Linux distributions

## Freedom of choice ...

AbulÉdu Adamantix ADIOS AGNULA AL-AMUG ALT Amber Ankur Bangla Annvix ANTEMIUM APODIO Arabbix Arch Ark Asianux ASLinux ASPLinux Astaro Athene Auditor Augustux Aurora Aurox AUSTRUMI Ayrsoft B2D Bayanihan BearOps BeatrIX BEERNix Berry Biadix BIG LINUX BioBrew Bioknoppix blackPanther BlackRhino BLAG Blin Bluewall Bonzai Boten BrISpeak Buffalo Burapha ByzantineOS Caixa Mágica cAos CCux CDlinux Censornet CentOS Chinese 2000 ClarkConnect CLE Clusterix clusterKNOPPIX Co-Create Cobind College Condorux Conectiva Cool Core Cosix CPUBuilders CRUX Càtix Damn Small Danix DARKSTAR DeadCD Debian DebXPde Deep-Water Defender Definity DeLi Devil Dizinha DNALinux DragonFly dyne:bolic Eadem eduKnoppix EduLinux eLearnix ELX EnGarde ERPOSS ESware Euronode Evinux FAMELIX Feather Fedora Fermi FIRE Flash Flonix FoRK FoX FreeBSD Freedows Freeduc-Sup Freeduc Freepia FreeSBIE Frugalware FTOSX GeeXboX Gelecek Gentoox Gentoo GEOLivre Gibraltar GNIX Gnoppix gNOX gnuLinEx GNUstep GobLinX GoboLinux grml Guadalinux GuLIC-BSD Haansoft Hakin9 Hancorn Happy Mac Haydar Helix Hikarunix HispaFuentes Hiweed HKLPG Holon iBox Icepack IDMS Ignalun Impi IndLinux INSERT IPCop JoLinux Jollix Julex JUSIX K-DEMar K12LTSP Kaella Kalango KANOTIX Kinneret KlusTriX kmLinux knopLS Knoppel Knopperdisk Knoppix 64 Knoppix STD KnoppiXMAME KNOPPIX KnoppMyth KnoSciences Kore KRUD Kurumin L.A.S LAMPPIX LBA-Linux LFS LGIS Libranet LIIS Linare Lineox LinEspa Linpus Linspire Linux XP Linux+ Live Linux4all LinuxConsole Linuxin LinuxTLE Litrix LiveCD Router LiVux LLGP LNX-BBC Loco Lonix Lormalinux Luinux Luit Lunar Lycoris m0n0wall Magic Mandows Mandrakelinux MAX MCNLive Media Lab Mediainlinux MEPIS MIKO GNYO Minislack Miracle MirOS MIZI MoLinux Momonga Morphix Movix MSC.Linux Munjoy Murix Nasgaia Nature's Navyn OS NetBSD Netwosix Nitix NordisKnoppix Novell NuxOne O-Net Octoz OGo Knoppix Omoikane Onebase OpenBSD OpenLab OpenNA Openwall Oralux Overclockix P!tux PaiPix ParallelKnoppix Pardus Parsix PCLinuxOS Peanut Penguin Sleuth Pequelin Phayoune PHLAK PHP Sol Pie Box Pilot Pingwinek Plamo Plan-B PLD Progeny Project dEv Puppy QiLinux Quantian Rays Red Flag Red Hat redWall Resala RIP Rocks Cluster ROCK ROOT ROSLIMS Rubyx RUNT Salvare SAM Santa Fe SCI.Linux Scientific Securepoint SENTINIX Sentry Firewall Shark Skolelinux Slackware Slavix SLAX Slix Slo-Tech SME Server SmoothWall SoL Solaris Sorcerer Source Mage Soyombo Specifix SphinxOS StartCom stresslinux STUX SuliX Sun JDS SUSE SystemRescue T2 Tablix Tao TA Tech TFM Thiz Tilix tinysofa TPM TrianceOS Trustix TupiServer Turbolinux Turkix Ubuntu UHU-Linux UserLinux Ututo Vector Vidalinux Vine ViruX vnlinuxCD White Box WHoppix WOMP! WOW X-evian X/OS Xandros Xarnoppix Xfld Xteam Yellow Dog YES Yoper ZENIX ZerahStar ZoneCD Zopix

# Linux distributions

## What is a Distribution?

A combination of a Kernel (or a choice of many) and all sorts of software, tools and choices into one bundle.

Most distributions have a specific target group or specialist purpose.

Distributions have their specific look-and-feel, their culture, their fans & enemies ...

Kernel and software might be the thread and fabric - but the Distribution is the suit or dress ... and that should fit you!

... oh, and it's mostly just called a **Distro** ... :)



# Linux Distributions

Big ones for homeusers and business:

**Redhat (Enterprise / Fedora, + forks), Suse/Novell**

The smart ones ... good (not only) for newbies: **Mandrake, Ubuntu, Xandros, ...**

LiveCDs: **Knoppix, MEPIS, Gnoppix, Ubuntu ...**

Oh no, they look like #%&?dows: **Linspire, Lindows, Yoper, Xandros, ...**

Purist, stable, solid ... good for server use: **Debian GNU/Linux, Slackware**

For the enthusiast - source based distros: **Gentoo**

Linux for PowerPC platform: **YellowDog**

Small is beautiul: **Damn Small Linux, mu-linux**

not Linux, but related: **BSD (FreeBSD, OpenBSD, ..), Mac OS X**

# Linux Distributions: Mandrake



*Mandrakelinux™ is a friendly Linux Operating System which specializes in ease-of-use for both servers and the home/office. It is freely available in many languages throughout the world.*

① Derived from Redhat. Very user friendly and easy to install. Good package management.  
Popular for very good reasons.



From beginner to expert , desktop to lightweight server

\$ free for download – CDs, club membership and extras cost money  
**www** <http://mandrakelinux.com>

# Linux Distributions: Debian



*Debian uses the Linux kernel (the core of an operating system), but most of the basic OS tools come from the GNU project; hence the name GNU/Linux. Debian GNU/Linux provides more than a pure OS: it comes with more than 8710 packages, precompiled software bundled up in a nice format for easy installation on your machine.*

- ① Very purist, stable, strictly security oriented. Politically aware.  
Starting point for many development projects
- 👤 👤 Highly recommended for server rather than for desktop use, though it works nicely on a laptop too. Maybe not for the absolute beginner.  
Package manager (apt, apt-get) can be tricky.
- \$ free
- www <http://debian.org>

# Linux Distributions: Redhat



*Sold by annual subscription. Runs on multiple architectures. Certified by top enterprise software and hardware vendors. And backed by Red Hat Network and up to 24x7 support. Red Hat Enterprise Linux is the premier operating platform for open source computing. ....*

*The Fedora Project is a Red Hat sponsored and community-supported open source project. It is not a supported product of Red Hat, Inc. The goal? Work with the Linux community to build a complete, general purpose operating system exclusively from free software. Public forum. Open processes. A proving ground for new technology that may eventually make its way into Red Hat products.*

① One of the biggest and oldest.

♂ ♀ Aims at business user rather than private user. Easy enough for beginners though.

\$ many products ... from free (Fedora) up to many USD 1000

www <http://www.redhat.com/>



# Linux Distributions: Centos



*Community enterprise operating system*

*CentOS exists to provide a free enterprise class computing platform to anyone who wishes to use it. CentOS 2 and 3 are fully compatible rebuilds of RHEL 2 and 3 respectively. CentOS 2 and 3 are reproduced from RHEL sources that are freely distributed by RedHat. Redistributed packages and sources comply fully with RedHat's redistribution requirements. CentOS 2 and 3 are designed for people who need an enterprise class OS without the cost, support, certification, or brand name of RedHat.*

① A fork of Redhat Enterprise, Centos is an alternative for those who are tired of the Redhat strategy.

👤 👤 Enterprise users  
\$ free, buy CDs  
**www** <http://www.centos.org/>

# Linux Distributions: Ubuntu



*Ubuntu is a complete Linux-based operating system, freely available with both community and professional support.*

*The Ubuntu community is built on the ideas enshrined in the Ubuntu Manifesto: that software should be available free of charge, that software tools should be usable by people in their local language and despite any disabilities, and that people should have the freedom to customise and alter their software in whatever way they see fit.*

① Built on Debian. Focus on global community. Very user friendly, very good choice of best-of-breed software in each field.

👤 👤 Desktop users. Great for beginners with room for experts.

\$ free – they even ship it free to projects that apply!

**www** <http://ubuntulinux.com>

# Linux Distributions: Gentoo



*Gentoo Linux is a special flavor of Linux that can be automatically optimized and customized for just about any application or need. Extreme configurability, performance and a top-notch user and developer community ...*

*... Gentoo Linux can become an ideal secure server, development workstation, professional desktop, gaming system, embedded solution or something else -- whatever you need it to be. Because of its near-unlimited adaptability, we call Gentoo Linux a metadistribution.*

① In other words: you build (compile) it from scratch. :)



Not for the beginner, the impatient, or the faint at heart. For experts, it's tons of fun. Allow several days for installation.

\$

free

www

<http://gentoo.org>

# Linux Distributions: Slackware



*Since its first release in April of 1993, the Slackware Linux Project has aimed at producing the most "UNIX-like" Linux distribution out there. Slackware complies with the published Linux standards, such as the Linux File System Standard. We have always considered simplicity and stability paramount, and as a result Slackware has become one of the most popular, stable, and friendly distributions available.*

① Rather purist, it makes good friends with almost everyone ... almost!  
Start point for many interesting projects.



Not for the absolute beginner. Server rather than desktop.

\$ free

www <http://www.slackware.com>

# Linux Distros: “*Windows clones*”

*Xandros, Linspire, Yoper, ...*

① Distros trying to make it easy for users that are used to the Windows feel.

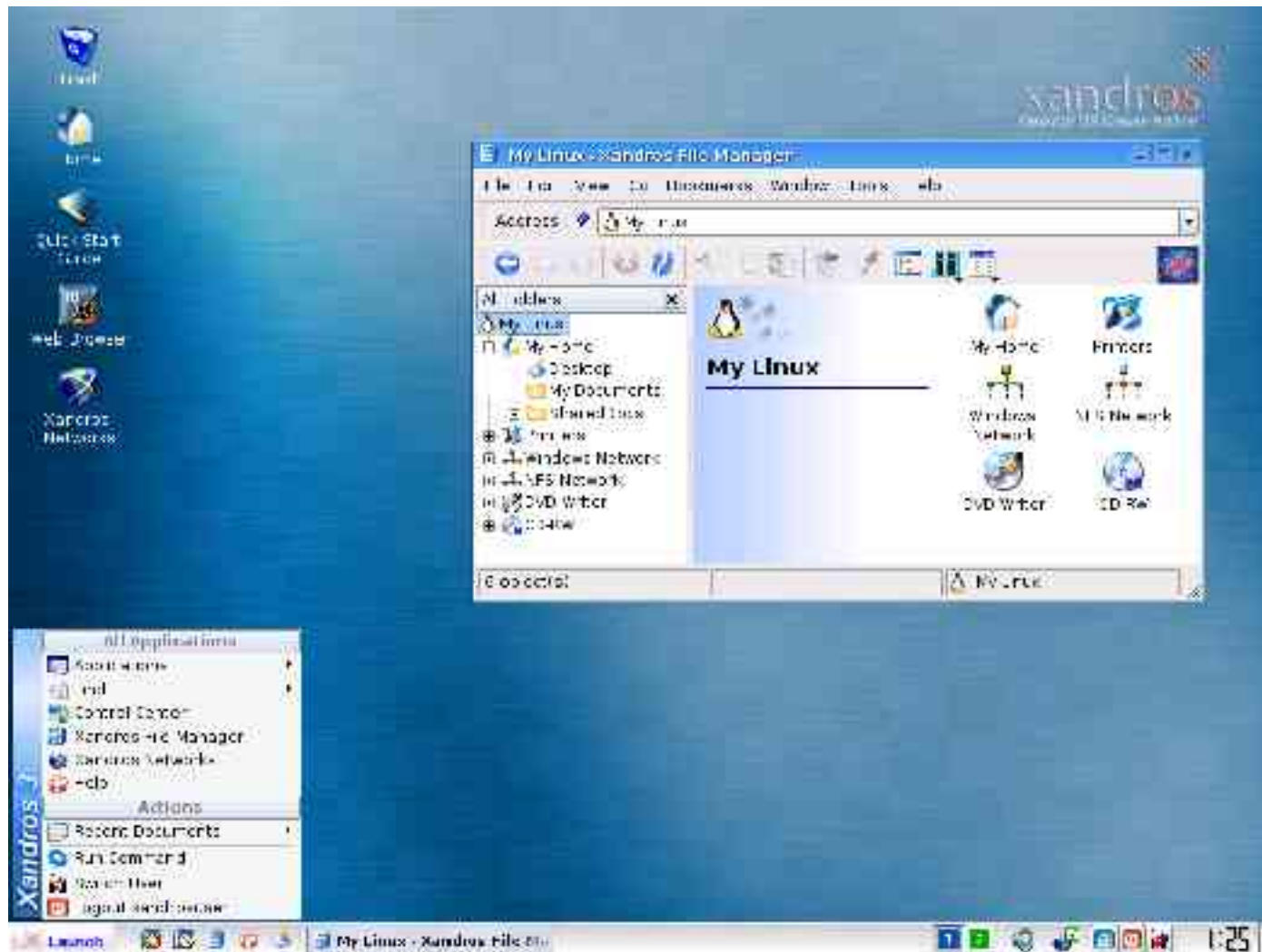


Desktop users, good for beginners.

\$ Xandros: free – USD 130 / Linspire: from USD 89 / Yoper: free

www <http://xandros.com>  
<http://linspire.com>  
<http://yoper.com>

# Linux distros ... or is it Windows?



Screenshot from  
Xandros

# Linux Distros: LiveCDs

***KNOPPIX** is a bootable CD with a collection of GNU/Linux software, automatic hardware detection, and support for many graphics cards, sound cards, SCSI and USB devices and other peripherals. KNOPPIX can be used as a Linux demo, educational CD, rescue system, or adapted and used as a platform for commercial software product demos. It is not necessary to install anything on a hard disk. Due to on-the-fly decompression, the CD can have up to 2 GB of executable software installed on it.*

***Gnoppix** is a linux live cd based upon Ubuntu . It can be compared to Knoppix but Gnoppix uses GNOME as desktop environment*

① Distros that you boot from CD without installing on your computer.  
Most of them CAN be installed, though.

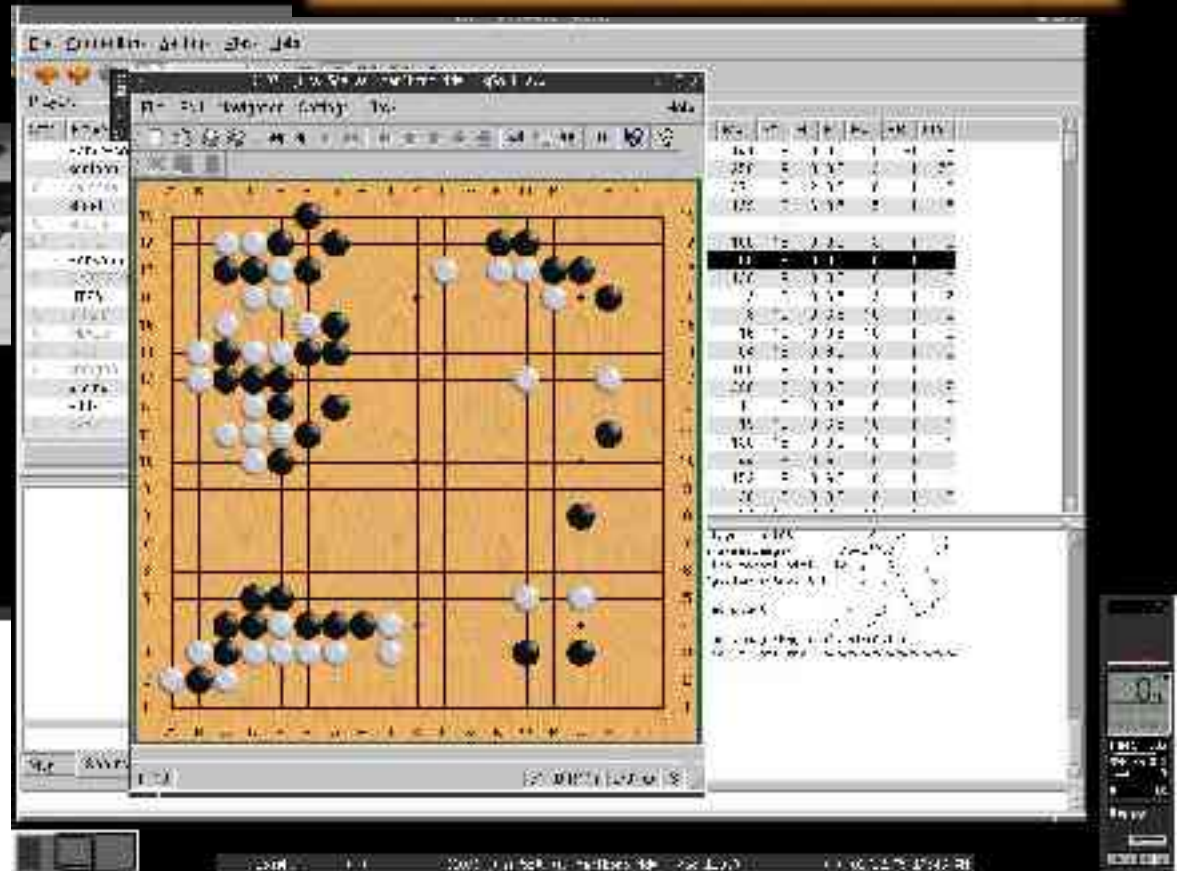
👤 👤 Good for beginners, travellers, experimenters.

\$ free

www <http://knoppix.com>  
<http://amu.debian.net/> (gnoppix)



# Linux Distros: Exotic Distros :)





# Software for Linux

**What (you might want) to use for what:**

**(these are only suggestions! Your distro has more! :)**

the command line tools

office: **OpenOffice** and its derivatives

web: **firefox**, **mozilla**, **konqueror**, lynx

mail: **thunderbird**, **evolution**, pine, mutt ..

Instant Messaging: **gaim**, gabber

graphics: **GIMP**

windows emulation: wine, crossover office

# Software for Linux

development: C/C++, perl, python, java, mono ... plus everything else :)

web dev: the **LAMP** platform (Linux-Apache-MySQL-PHP/perl), **ZOPE**,  
**Wikis**

e-smith – ask Tomas about it :)

VoIP: skype, sjphone, kphone, ..

specialist domain software

wireless tools and drivers – we ll talk about that later

# Global Linux

A natural starting point for localization are some of the most popular and important user space applications and desktops, for example:

Open Office

<http://qa.openoffice.org/localized/status.html>

Mozilla

<http://www.mozilla.org>

KDE Desktop

<http://i18n.kde.org/teams/>

Gnome Desktop

<http://developer.gnome.org/projects/gtp/teams.html>

# Global Linux: Kilinux.org

## **The Open Swahili Localization Project Mradi wa kuswahilisha programu huria**

Karibu kwenye tovuti ya Kilinux (klnX)!

klnX ni Mradi wa Kuswahilisha Programu ya Linux ulionzishwa na muungano kati ya Chuo Kikukuu cha Dar es Salaam na Kampuni ya Kiswidi IT+46.

Mradi huu umeundwa na timu ya wataalamu kutoka katika Idara ya Kompyuta na Taasisi ya Utafiti wa Kiswahili, Chuo Kikuu Cha Dar es Salaam. Kusudi na jitihada za mradi huu siyo tu kubadili programu huria kwa lugha ya kiswahili bali pia kuwafahamisha wazungumzaji wa Kiswahili faida ya kutumia programu huria. Mradi huu unafadhiliwa na Chuo Kikuu Cha Dar es Salaam na Shirika la Kimataifa la Maendeleo la Kiswidi (SIDA).

There is also an online translator: <http://www.kilinux.org/kiblog/kamusi/>

Short Intro to klnX

Welcome to the Kilinux (klnX) website!

klnX is an Open Swahili Localization Project started by the joint effort between the University of Dar es Salaam (UDSM) and the Swedish IT consultancy company IT +46. The project has gathered a multidisciplinary team composed by members of the Department of Computer Science and the Institute of Swahili Research. This pioneering effort does not only aim to localize free and open source software to the Swahili language, but also create awareness among swahili speakers of the benefits of using and extending open source software.

This project is supported by the UDSM and the Swedish Development Agency (SIDA).

# Global Linux: Indlinux

<http://indlinux.org/>

## Localizing free software, for a free country

The goal of this project is to create a Linux distribution that supports Indian Languages at all levels.

This Indianisation project will strive to bring the benefits of Information Technology down to the Indian masses.

We want to make technology accessible to the majority of India that does not speak English.

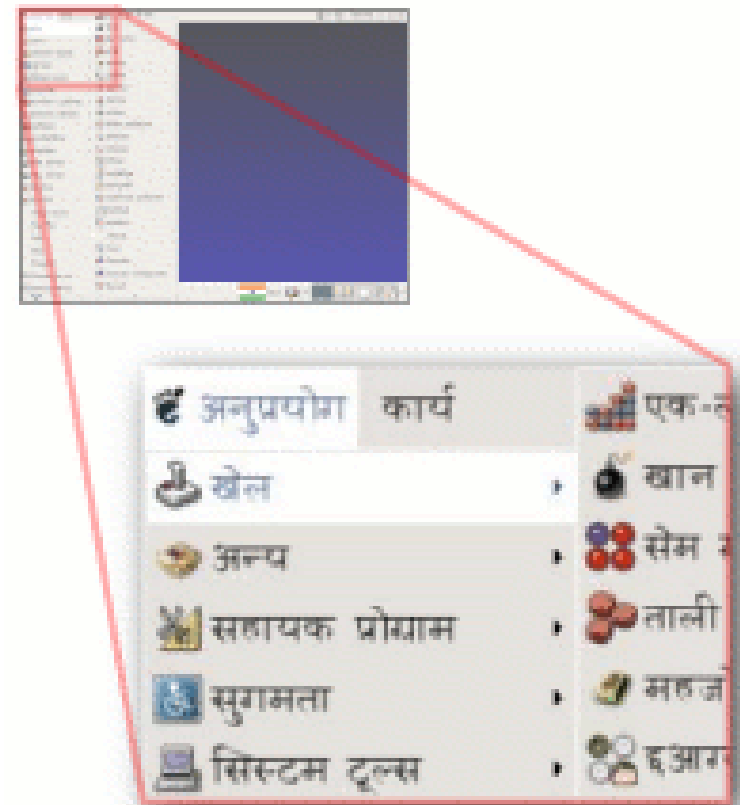
The Indian Linux project is open source and completely free. It is licensed under the GNU General Public License.

### Language Teams:

Hindi, Punjabi, Oriya and Telugu

### Other Localisation Teams:

Bengali, Gujarati, Kannada, Malayalam, Marathi, Tamil



# Global Linux: arabeyes

<http://www.arabeyes.org/>

Arabeyes is a Meta project that is aimed at fully supporting the Arabic language in the Unix/Linux environment. It is designed to be a central location to standardize the Arabization process. Arabeyes relies on voluntary contributions by computer professionals and enthusiasts all over the world.



# Global Linux: FOSSFA portal

## FOSSFA – Free and Open Source Software for Africa

projects: [http://www.fossfa.net/fossfadb.php?search=&search\\_db=projetc&find=1](http://www.fossfa.net/fossfadb.php?search=&search_db=projetc&find=1)

finds 49 projects, for example

### ► Translate.org.za

Translation of Opensource software into all South African languages

<http://translate.org.za/>

Translate.org.za is a non-profit organisation producing Free and Open Source software that enables and empowers South Africans. The Translate Project started in 2001 with the vision of providing Free Software translated into the 11 official languages of South Africa. Free Software in your language is true empowerment. e.g. KDE translation

### ► Linux in **Schoolnet Namibia (<-- wireless!)**

Open Source Use in Schools in Namibia

# URLs

The Linux documentation project

<http://www.tldp.org/>

Linux Enterprise portal

<http://www.linux.com/>

GNU Operating System - Free Software Foundation

<http://www.fsf.org/>

Open Source Initiative

<http://www.opensource.org/>

Linux kernel and more

<http://kernel.org>

<http://linux.oreilly.com/>



# URLs

Samba – file and print services integration for Windows/Linux

<http://www.samba.org>

Google can limit its search to Linux related info

<http://www.google.com/linux>

Open Source Software Project

<http://www.sourceforge.net>

# Thanks! )

**Questions? Additions? Corrections? Ideas?**

Activities during the next days?

Ubuntu LiveCD

Install Linux from scratch (Ubuntu, Mandrake, Slackware, ...)

Apache?

Linux Networking

Linux on the Linksys WRT54G

**[sebastian@wire.less.dk](mailto:sebastian@wire.less.dk)**

**<http://wire.less.dk>**

**<http://thewirelessroadshow.org>**