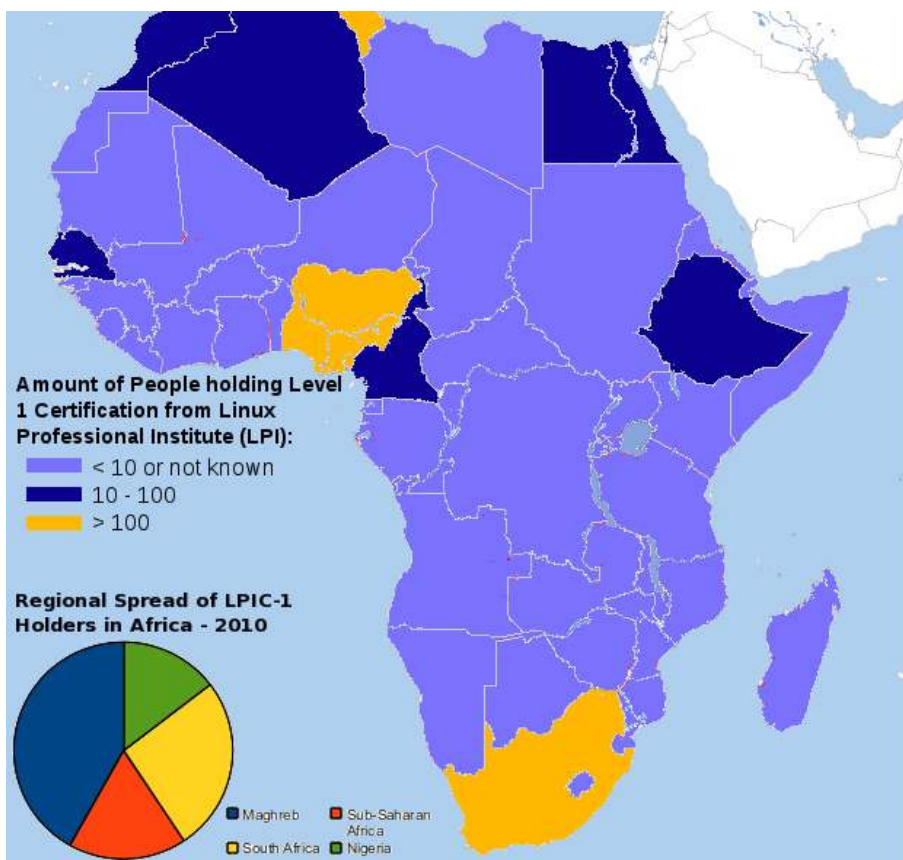


ict@innovation

Creating Business and Learning Opportunities with Free and Open Source Software in Africa

ict@innovation: Training Guide on Linux System Administration, LPI Certification Level 1 Supporting African IT-enterprises to get Open Source skills and certification on level 1 of the Linux Professional Institute (LPI) Certification



<http://www.ict-innovation.fossfa.net>

Version 0.9, May 26, 2011 -

On behalf of:



published by:



giz

[ict@innovation: Training Guide on Linux System Administration, LPI Certification Level 1 - Supporting African IT-enterprises to get Open Source skills and certification on level 1 of the Linux Professional Institute (LPI) Certification] Created during the initiative "ict@innovation - Creating Business and Learning Opportunities with Free and Open Source Software in Africa", a programme of FOSSFA and GIZ (until 2011: InWEnt - Capacity Building International, Germany). For more information see www.ict-innovation.fossfa.net / Provided under a Creative Commons Attribution-Share Alike 3.0 Germany License. Copyright: FOSSFA & GIZ

Imprint

Publisher

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
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Funding

This document has been produced with the financial assistance of the German Federal Ministry for Economic Cooperation and Development (BMZ). The contents of this document are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the BMZ, GIZ, or FOSSFA

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INTRODUCTION BY FOSSFA AND GIZ

“How do I know that this IT company from Kampala will be able to maintain my IT server infrastructure?” asks a contract-giving government agency in Uganda. The answer lies in a trust-building certification, a crucial ingredient of any economic development agenda. Therefore, FOSSFA and GIZ are proud to present “ict@innovation: Training Guide on Linux System Administration - LPI Certification Level 1”. The guide is part of “Linux Certification in Africa - the ict@innovation Training of Trainers Programme”. It aims to help African small and medium IT-enterprises (SMEs) involved in Free and Open Source Software (FOSS) to improve the quality of their services offered as well as the level of trust of customers through certification of their FOSS skills.

The ict@innovation programme builds capacities in African small and medium ICT enterprises to make a business with Free and Open Source Software (FOSS). ict@innovation aims to encourage the growth of African ICT industries, through three main actions: spreading FOSS business models for enterprises, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development. ict@innovation is a partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany [until 2011: InWEnt, now part of GIZ].

We hope that the “ict@innovation: Training Guide on Linux System Administration - LPI Certification Level 1” together with the associated training-of-trainers scheme will contribute to remove a major barrier against adoption and deployment of Free and Open Source Software (FOSS) in sub-Saharan Africa: the lack of human resources with FOSS skills demonstrated by recognized certificates.

In order to support a wide range of capacity needs and training environments in Africa, the training material and the training-of-trainer programme builds on the Linux Professional Institute (LPI) Certification as a world-wide recognized distribution and vendor-neutral standard for evaluating the competency of Linux professionals with the possibility to hold low-cost paper-based examinations.

The “ict@innovation: Training Guide on Linux System Administration - LPI Certification Level 1” has been released under an open licence (Creative Commons Attribution-Share Alike 3.0 Germany License) allowing for free distribution, remixing and updating of the material. Our goal is thereby to empower local African training institutions to offer low-cost trainings. And we are looking forward to further building and updating of this Training Guide in the spirit of sharing and mutual capacity building.

Of course, we thank and attribute the authors of the commons resources, that have formed the basis for this manual (for full acknowledgement, please see section “Authors, Attribution and Licensing”).

We take this opportunity to thank the following people who played a big role in the production of the Training Guide. First is the lead editor, Evans Ikua, the FOSS Certification Manager at ict@innovation (Kenya) who oversaw the entire production process. We also thank the content editors, Mark Clarke of Jumping Bean (South Africa), Brian Ssenoga of the University of Health Sciences (Uganda) and Dr Chris Brown of Stay Awake Training Ltd (UK). We also thank the following experts who participated as co-editors, John Matogo, Ken Mutua, Bernard Adongo, (Kenya) and Trust Zifa (Zimbabwe). Many thanks also go to George Nyambuya, the ict@innovation Africa Coordinator (South Africa), Petra Hagemann, Project Manager at GIZ Germany, David Paulus, editor / GIZ, all the participants of the first regional LPI training of trainers workshop held in Nairobi for their initial review, especially Sisay Adugna (Ethiopia), and all other people who participated to make this manual a reality.

ict@innovation hopes that this manual will indeed support the acquisition of adequate FOSS skills by a large population of Linux System Administrators especially in sub-Saharan Africa. We believe that this will help us achieve our goal of promoting the socio-economic development of Africa by supporting the growth of the ICT industries in the SME sector through the implementation of quality FOSS services through certification. May a thousand more local innovative IT solutions and services blossom on the continent!

Nnenna Nwakanma, FOSSFA Council Chair and CEO, NNENNA.ORG
Balthas Seibold for the GIZ Team, Senior Project Manager, GIZ

Who this guide is for

This guide was mainly written for African experts and institutions wanting to become qualified trainers on the subject of Linux system administration. It is geared towards Trainers who want to incorporate FOSS Certification training based on the Linux Professionals Institute (LPI) community certification program into their institution's curriculum and/or developing FOSS Certification training as a new revenue stream. This open training guide provides a structured set of learning modules with learning objectives, key knowledge areas, introductions and concrete learning steps and handouts as well as a module on how to be a FOSS trainer. The guide is therefore particularly suitable for use in Training-of-Trainers settings and the development of advanced courses within ICT-associations, their member organisations, ICT-training institutions as well as universities. It can be used in tutored learning environments (e.g. 2 weeks courses preparing for the certification exam) as well as other settings such as peer-to-peer learning, self-study, blended learning and e-learning.

In addition, any learner anywhere in the world will find this guide useful for study and preparation of the LPI certification. She or he will learn how to fulfil the first essential steps in becoming a Linux System Administrator charged with installing, supporting, and maintaining Linux-based computer systems.

The training guide builds on the Linux Professional Institute (LPI) community Certification as a world-wide recognized distribution-neutral and vendor-neutral standard for evaluating the competency of Linux professionals with the possibility to hold low-cost paper-based examinations. It has three levels. The LPIC-1 (101 and 102 exams) level taught in this guide cover the fundamental Linux system administration skills. Like the LPI curriculum itself, the course is "distribution neutral"; that is, it does not favour a specific Linux distribution. Learners can therefore use this manual not only to pass the LPIC-1 exams but also be in a position to operate a range of different Linux distributions. The detailed objectives of LPI EXAM 101 AND 102 are online at:

http://www.lpi.org/eng/certification/the_lplic_program/lpic_1

Learners are expected to have:

- Extensive experience (several years) using computers, including a strong knowledge of hardware components and their interaction with basic operating system (OS) components.
- A general knowledge of computing and networking basics such as binary and hexadecimal maths, file-system structures, Ethernet and Internet networking operations and hardware, etc.
- More than three cumulative months of practical experience using a GNU/Linux, BSD or Unix OS, working at the command-line (in a text terminal or console) either locally or remotely.

Those with less experience, however, should not be discouraged from using this guide, if (and only if) they are willing to spend extra time catching up on the prerequisite background skills and knowledge; a challenging task, but not an impossible one.

What you can learn through this guide

I) In the **LPI 101** module you will learn how to:

- Install Linux, making appropriate choices for disk partitioning
- Boot the system, change run levels, shut-down and reboot
- Work effectively at the shell command prompt
- Install and manage packages using both RedHat and Debian tools
- Manage, find, copy, delete, archive and compress files and directories
- Process text streams using pipes, filters and re-direction
- Manage processes and modify process execution priorities
- Search text files with regular expressions and edit files with vi
- Create partitions and filesystems, and maintain their integrity
- Control file access permissions

II) In the **LPI 102** module you will learn how to:

- Customise the shell and write simple shell scripts
- Query databases and manipulate data using SQL
- Install and configure the X server and set up a display manager
- Manage user accounts and groups
- Schedule jobs at regular intervals using cron
- Localise the system for a language other than English
- Keep your system clock correct
- Manage printers and printing
- Understand IP networking and set up a basic network configuration
- Maintain host security and enable secure login with ssh

III) In the “**FOSS Trainer**” Module you will learn, how to become a trainer in Free and Open Source Software (FOSS):

- Understand some of the requirements for becoming a FOSS trainer
- Be able to identify and seize the opportunities that exist for FOSS training as a business
- Gain the knowledge and skills required to organise and provide FOSS training
- Appreciate the benefits of peer production of Open Educational Resources and Open Content

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