

Free Standards Group



Trademarks etc

- Linux is a registered trademark of Linus Torvalds
- UNIX is a registered trademark of The Open Group
- POSIX is a registered trademark of the IEEE
- LSB and LSB Certified are registered trademarks of the Free Standards Group



Study Group Scope

- Accept nominations from JTC 1 National Bodies and other SCs, as well as Liaison Organizations and JTC 1 Recognized PAS Submitters, for participation in the Study Group.
- Assess how SC22's present activities are relevant to the LINUX Operating System market.
- Assess how the activities of the Free Standard Group and other organization may be of interest with SC 22 mandate.



Study Group Scope

- Initiate, if it judges it necessary, activities to increase the relevance of its work program to the LINUX Operating System market, as per the JTC 1 Directives.
- Report on its activities to the next JTC 1 Plenary in 2003 in Singapore.



Outline / Agenda

- The Free Standards Group
 - What
 - Who
 - Projects
- Linux
- The LSB
- OpenI18N
- LANANA
- OpenPrinting
- Open Cluster Framework
- ISO/IEC JTC1/SC22
- Future directions



Background

- What is the Free Standards Group?
 - The Free Standards Group develops and makes freely available standards, tools and compliance testing, allowing for application portability across multi vendor platforms.



Background

- An umbrella group for several open source standards efforts, the Free Standards Group acts as a key facilitator between the needs of the free and open source development community from which it came and the IT industry that increasingly relies on Linux as a solutions platform.
- California nonprofit, member supported organization



FSG Membership

- Four classes of member
 - Corporate
 - Platinum
 - Gold
 - Silver
 - Individual
 - Non Profit
 - Government



Who Is Involved?

- Platinum Members
 - Hewlett-Packard
 - IBM
 - Intel
- Gold Members
 - Caldera International
 - Conectiva
 - MandrakeSoft
- More Gold Members
 - Miracle Linux
 - MontaVista
 - Red Hat
 - Sun Microsystems
 - SuSE Linux
 - Turbolinux
 - VA Software



Who Is Involved?

- Silver Members
 - AMD
 - Dell Computer
- Non Profit Members
 - Japan Linux Association
 - Linux International
 - Linux Professional Institute (LPI)
- Non Profit Members
 - OSDL
 - PC Open Architecture Developers' Group (OADG)
 - Software in the Public Interest (SPI)
 - Software Liberty Association of Taiwan (SLAT)
 - USENIX



Project Membership

- Each of the projects has Open attendance
 - No need to be a member of the FSG to participate in a project
 - Anyone can submit comments on documents
 - Membership in FSG will allow you to affect the way a project is run
 - Individual Membership is US \$25 a year. This fee is waived for people who have contributed their time to a Workgroup.



Projects

- FSG has several subgroups and ongoing projects
 - Linux Standards Base (LSB)
 - OpenI18N
 - LANANA
 - Open Printing
 - Open Cluster Framework
- Also several affiliated projects run by other groups
 - File Hierarchy Standard, X Desktop



Linux History

- Linux started life as a clone of Andrew Tanenbaum's Minix OS
- Written by Linus Torvalds in 1991
 - Later joined by many others
 - Small core team maintains kernel
- Rapid growth
 - Serious rival to Microsoft Windows on desktop
 - Serious rival to UNIX in the server room

Linux History

- A Usenet posting in July 1991:

From: torvalds@klaava.Helsinki.FI (Linus Benedict Torvalds)
Newsgroups: comp.os.minix
Subject: Gcc-1.40 and a posix-question
Message-ID: <1991Jul3.100050.9886@klaava.Helsinki.FI>
Date: 3 Jul 91 10:00:50 GMT
Hello netlanders,
Due to a project I'm working on (in minix), I'm interested in
the posix
standard definition. Could somebody please point me to a
(preferably)
machine-readable format of the latest posix rules? Ftp-sites
would be
nice.



Linux Distributions

- Linux has one major difference from UNIX
 - One Linux kernel, maintained by Linus Torvalds and small core developer team
 - One set of core libraries and tools
- Different companies package Linux kernel, libraries and tools in different ways
 - A very different standards problem from U*X in 1980's
 - Release not version disparities

Linux Hardware

- Linux runs on many H/W platforms
 - Largest single platform is IA-32
 - Itanium, PPC, PPC64, IBM RS-6000
 - Alpha, SPARC, 68000
 - ARM, Hitachi SuperH, S/390
 - MIPS, PA-RISC, VAX
 - AMD x86-64, CRIS etc



Linux Distributions

- Many companies have packaged the Linux kernel with utilities and installers etc
 - Red Hat
 - SuSE
 - Slackware
 - Best Linux
 - Caldera
 - Debian
 - Connectiva
 - Definite Linux
 - Linux Mandrake
 - TurboLinux
 - LinuxPPC
 - Yellow Dog
- To name but a few ...



Linux Cost

- Linux kernel is free
 - Source available for free download
 - Utilities largely freely available
- Distributors have to make money
 - Support
 - New patches available every few days from most
 - Installation process
 - Documentation



GNU/Linux

- Officially, most (if not all) distributions are really “GNU/LINUX”
- The GNU project started producing Free, Open Source versions of popular UNIX utilities in 1984
 - GNU's Not UNIX
- GNU is principally sponsored by the Free Software Foundation (FSF)
 - N.B. FSF != FSG

GNU/Linux

- Linux is the Kernel
- GNU provides the Libraries, Shell and Utilities
- Distributors package these with installation and bootstrap utilities

Open Source & Free Software

- Free Software
 - Not just zero cost
 - Software giving user certain freedoms
 - GNU General Public License (GPL)
 - Seen by many as so restrictive in its freedoms as to be useless!
- Open Source
 - Source code is freely available



Open Source & Free Software

- Free Software is a matter of liberty, not price
 - Compare Free Speech v. Free Beer
 - Freedom to run the program for any purpose
 - Freedom to study how the program works
 - Freedom to adapt and modify
 - Freedom to redistribute
 - Freedom to improve

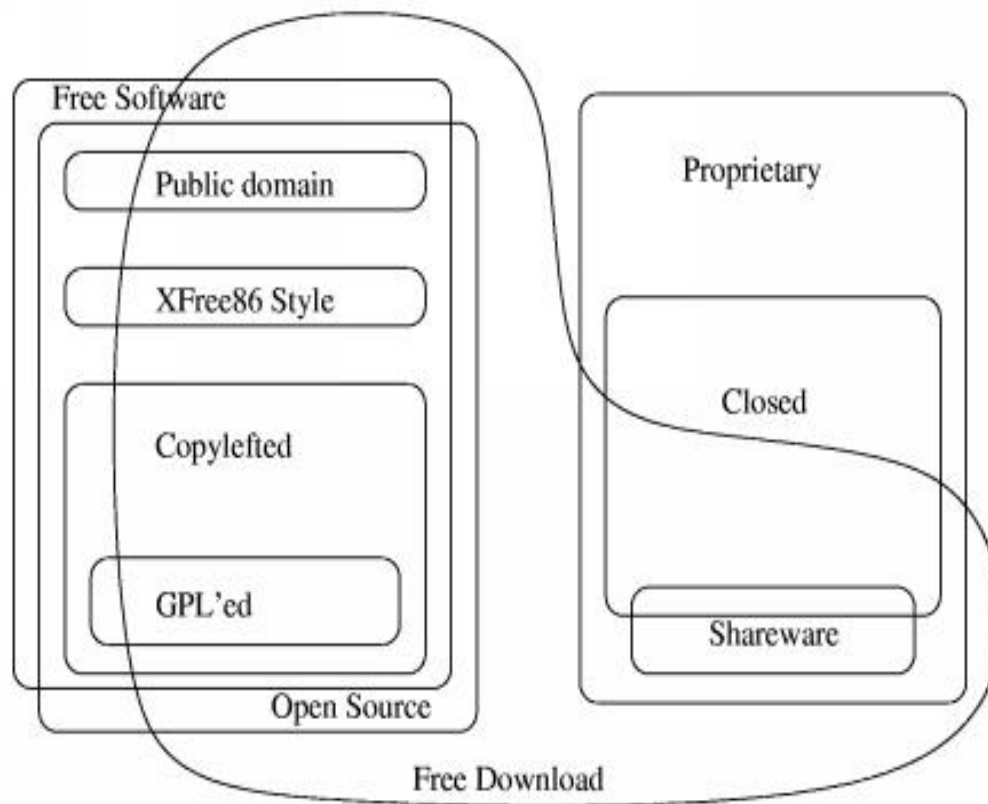


Open Source & Free Software

- Free Software does not mean non-commercial
- Open Source software has fewer freedoms
 - Source code is freely available
 - May be licensed in various ways
 - Several models for making money
 - Support charges
 - Documentation charges
 - Consulting charges



Software Categories



Copyleft

- Copyleft is a variant of copyright
 - Redistributors may not add additional restrictions
 - Every copy, even if it is heavily modified, must be as free as the original
 - Copyleft is a concept, but the most common implementation is the GPL
 - Two different copyleft programs may have incompatible restrictions, and therefore cannot be merged

Open Source

- Open Source community a superset of the Free Software community
 - Well, not strictly, but near as makes no difference!
- Open source includes most of the free software freedoms
 - Free redistribution
 - Free Access to source code
 - Freedom to modify



Open Source

- Difference between Free Software and Open Source more philosophical
 - Open Source is a development methodology
 - Free Software is a political and social movement



Linux And Standards

- *"Despite their well earned reputation as a source of confusion, standards are one of the enabling factors behind the success of Linux. If it weren't for the adoption of the right standards by Linus Torvalds and other developers, Linux would likely be a small footnote in the history of operating systems."* - Dan Quinlan, Free Standards Group Chairman



Linux And Standards

- Linux has always been a player in the Standards game
 - What's new is JTC1 interest!
- Linux follows (though may not always be strictly conforming to) many international standards
 - POSIX
 - UNIX
 - TCP/IP



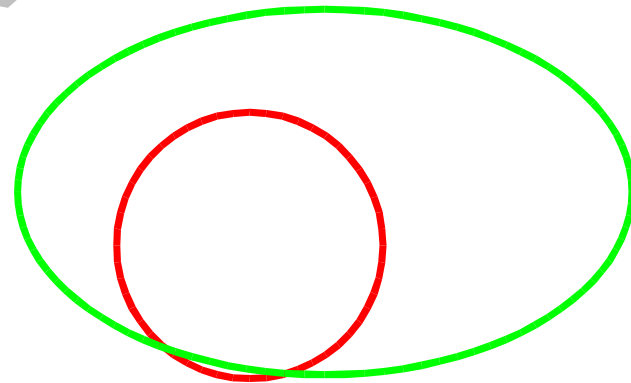
Linux And Standards

- Linux Developers are involved in Standards development; e.g.
 - Heavily involved in Austin Group revision of POSIX
 - Unicode Technical Committee
 - ISO/IEC JTC1/SC2/WG2
 - W3C Internationalization Activity Group
 - Localization Industry Standards Association
 - LISA OSCAR SIG



Linux, UNIX & POSIX

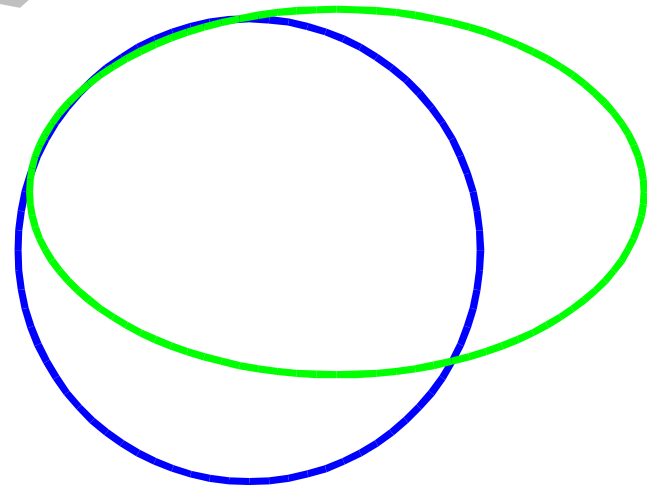
- Linux **!=** POSIX



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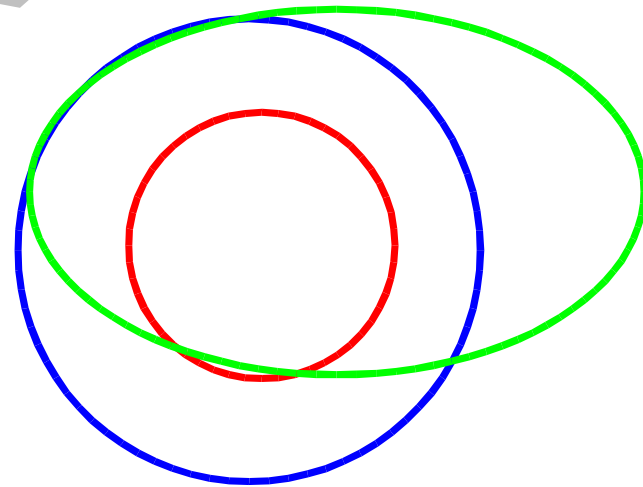
Linux, UNIX & POSIX

-
- Linux \neq UNIX



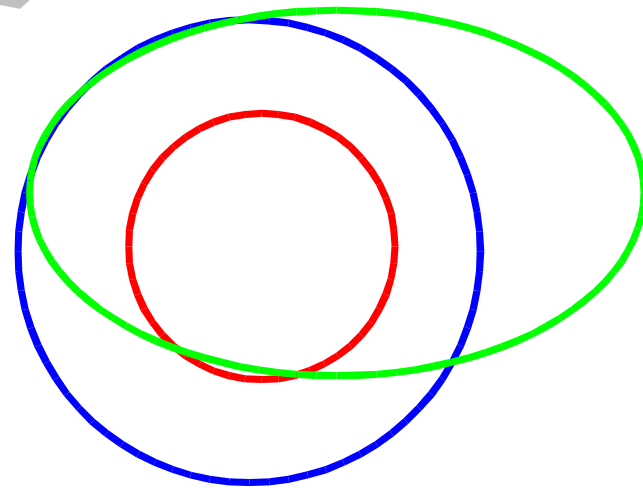
Linux, UNIX & POSIX

- Linux **!=** POSIX
- Linux **!=** UNIX



Linux, UNIX & POSIX

- Linux **!=** POSIX
- Linux **!=** UNIX
- But it is *real* close!



Linux, UNIX & POSIX

- The GNU libc (glibc) is very close to the Single UNIX Specification Version 3 (Austin Group)
 - Several interfaces not in glibc and mandatory in SUS V2 were made optional for V3
 - Latest glibc includes NPTL, the Native POSIX Thread Library for Linux, which is much closer to full POSIX thread semantics than its predecessors
- The LSB test program shares core common test suites which have been a catalyst to some of this

Linux Market Fragmentation

- Just as in the early days of POSIX development, multiple, incompatible, vendor implementations
 - Need to port applications from one vendor's version of Linux to another
 - File system layout inconsistencies
 - Library Version problems
 - User and group incompatibilities

LSB Goals

- The Goals of Linux Standards Base project
 - To develop and promote a set of standards that will increase compatibility among Linux distributions
 - To enable software applications to run on any compliant system.
 - To help coordinate efforts to recruit software vendors to port and write products for Linux.



LSB Goals

- To preserve backwards compatibility without locking out future progress
- To allow runtime environments to still be unique (and provide added value) by only standardizing the base
- To avoid fragmentation of the base functionality

Why is The LSB Needed?

- Allows ISVs to:
 - Minimize issues in porting code from another Linux platform
 - Allows a package to perform the same way regardless of the Linux runtime environment or emulation of such

What IS the LSB

- An Application Binary Interface (ABI)
 - Different approach to POSIX / UNIX (source API standards)
- A generic, processor-independent specification, plus a number of architecture specific supplements

What the LSB is NOT

- Not a mechanism to bring about one "Linux"
 - One port - multiple platform choices
 - Just as POSIX allowed multiple implementations
- It does not specify the Linux kernel level
 - The kernel can be any version that provides conforming interfaces
- It does not cover languages other than C
 - Future directions include other languages

LSB Standards Alignment

- Built on Industry Standards
 - IEEE Std 1003.1-1996 (Old POSIX.1)
 - IEEE Std 1003.2-1992 (Old POSIX.2)
 - The Open Group Single UNIX Specification Version 2 (aka UNIX98)
 - AT&T (Caldera/SCO) SVID, Issue 3 1989-2001
 - + at least 32 other public, open standards



LSB Conformance

- Source Test Suites available
 - LSB-FHS
 - VSX-PCTS
 - LSB-OS
 - LSB-USRGROUPS
- Binary Test Suite



LSB Certification

- Certification program up and running (since July 2002)
 - Certified Runtime Environments
 - Currently 19 certified platforms from 8 different vendors
 - Certified Applications
 - Application batteries for IA32, Itanium, and PPC-32
- Branding
- Development & Test Tools
 - Includes “Self Certification” program



The LSB as a Profile

- The LSB is in effect a profile of the underlying base API standards
 - Sets minimum-maximums and maximum-minimums
 - Mandates certain options
- It does permit some exceptions to underlying standards
- Adds restrictions

LSB Additional Requirements

- In addition to requirements from underlying specs
 - Users & Groups
 - File Hierarchy Standard
 - This is actually from a base standard
 - System Initialization
 - Package Format and Installation



LSB Specification

- Object File Formats
- Dynamic Linking
- Base Libraries
- Utility Libraries
- Graphics Libraries
- Packaging
- Commands & Utilities
- Standard Shell
- Users & Groups
- Filesystem Hierarchy
- System Initialization

OpenI18N

- Formerly known as LI18NUNIX
 - Goes beyond Linux
 - Linux specific elements incorporated in LSB
 - Group focus broadening across open source
- Charter
 - To propose and coordinate any Internationalization techniques, conventions, guidelines and activities within the open-source community.



OpenI18N Scope

- Focused on software/application portability and interoperability in the international context.
- Aims to provide a common open-source environment where applications can be executed and behave correctly worldwide, with different scripts, cultures and languages.
- Based on existing practice



Background

- The Linux Workgroup was created in September 1999. In October 2002, the workgroup was re-structured and renamed to OpenI18N. The objective of this re-structure was to reflect the workgroup's commitment to support open-source internationalization activities. This facilitates collaboration among Free Standards Group workgroups. Internationalization continues to be a challenge for open-source community.



Roadmap

- OpenI18N development is expected to last through January 31, 2005.
- The Free Standards Group Board of Directors will be consulted before that date if changes to the structure of the workgroup is required.
- Several Subgroups working in parallel



Subgroups

- Technical and administrative subgroups are established as necessary
 - Internationalization System Architecture
 - BiDi
 - Li18nux Application dev environment
 - ASTI
 - Input Method



More Subgroups

- Administration and localization of WEB contents
- Certification
- Guide document dev.
- Advanced Level Utility Development
- Application Development
- Big5 Standard
- LI18N/UX Test Suites
- LDML



OpenI18N Achievements

- A number of technologies delivered worldwide to date:
 - Li18nux (the precursor of OpenI18N) 2000 Specification and test suite
 - Locale naming guideline 1.0: adopted by glibc and others.
 - Universal locale repository 1.0: adopted by glibc.



OpenI18N Achievements

- Many IIMF language engines and bindings to popular environments.
- OpenI18N certification process
- Many internationalization patches to Linux distributions
- Active involvement with regional mandatory standards such as GB18030 and BIG5.



OpenI18N Conformance testing

- Test Suites available
 - 100% coverage of spec
- Certification process in place alongside LSB

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LANANA

- The Linux Assigned Names And Numbers Authority
 - c.f. IANA (the Internet Assigned Numbers authority)
 - Registration authority
 - Avoidance of name-space collisions
 - Package naming
 - Device naming



LANANA

- Collision avoidance gives
 - Better interoperability
 - More broadly available drivers
 - More applications for Linux!
- Several Namespaces managed
 - Devices
 - Packages
 - Initialization & Cron entries



OpenPrinting

- Standardizing a Scalable Print Environment
 - management,
 - reliability,
 - security,
 - scalability,
 - printer feature access
 - Network accessibility



Goals

- Standards need to be generated around the following areas:
 - Desktop
 - Device Discovery
 - Ability to identify the device and establish a connection for printing to said device.
 - Spooler
 - Ability for applications to enumerate the device and submit jobs.
 - Capabilities
 - Ability to understand what the capabilities of the device are.

Goals

- Queue
 - Ability to fetch print queue information.
- Print Job
 - Ability to fetch job information or to act on a job already in the process of being printed.
- Notification
 - Ability to provide information back to the system about the state of a job.
- Basic Print Support
 - Ability to provide a consistent set of print support regardless of the connection type or the print device. Consistent refers to a consistent page format given paper size, resolution, paper type, paper handling, and graphics output.

Goals

- Content Rendering
 - Ability to send document data (in the form of raster or PS) with a job description file (job ticket) to a print server. This print server represents a particular printer. It establishes the printing process with the printer, and collects and reports status back to the initiator.
- Network
 - Network Queue
 - Ability to provide print queue information to a non-Linux client (Samba interface to a Windows client).
 - Dynamic Discovery
 - Ability to discover a device and its capabilities on the fly .

OpenPrinting

- Based on existing practice and standards
 - IPP
 - LPRnG
 -

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OpenCluster Framework

- Newest FSG Project
 - Define standard APIs for basic clustering functions
 - Create and support an open source development project which acts as the reference implementation for the OCF APIs.
 - Intended to be largely platform-independent, capable of being implemented on most POSIX-compliant Operating Systems
 - Certain sections (kernel APIs for example) will be platform-specific.

Where Do We Go From Here?

- The FSG is actively seeking members and participants in all these projects
- FSG philosophy is to find good, existing, open standards and build on them
- No desire for invention
- No shackles on core developers



What Should ISO/IEC Do?

- Continue involvement in Austin Group
 - After WG15 demise, this is reassigned to SC22
 - Use this group to add additional Linux interfaces where appropriate to POSIX
- Help Prevent Linux and POSIX divergence
 - And any appearance of such
 - Two distinct standards, one for POSIX, one for Linux would be bad



Future Directions

- Open Source community unlikely to accept any imposed standard
- De Facto standards provided through FSG process could be adopted through PAS process
 - Allow for fairly rapid revision process

What should ISO/IEC Do?

- Other Ideas (general brainstorming session)
 - Formal Category C Liaison between FSG and SC22

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