Free/Open Source Software: What and Why

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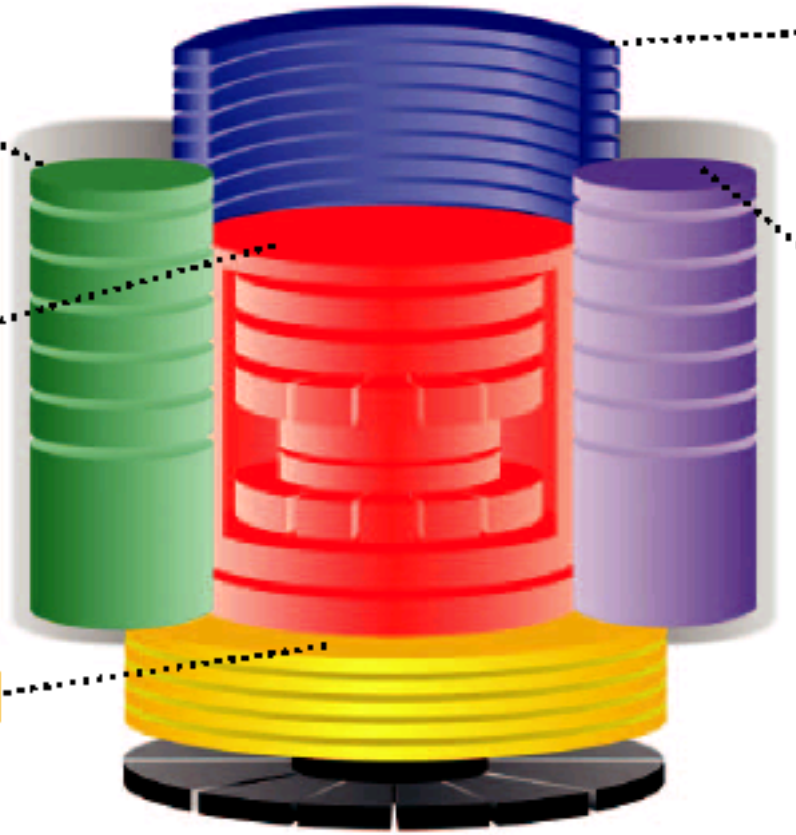
Outline

- Illustrative Examples
- Open is not for software alone!
- FOSS and Indian Academic Institutions

OSS Software List

OPEN SOURCE SHORT LIST

Open source software permeates the software stack. This summary highlights the most prominent open source software in each area of the stack.



CLIENTWARE
- OpenOffice
- Mozilla Firefox
- Ximian Evolution
- GIMP

MIDDLEWARE
- Openadaptor
- OpenLDAP
- Apache Axis
- OpenJMS
- Hibernate

PLATFORMS
- Linux
- FreeBSD
- Globus/OGSA

MANAGEWARE
- MX4J
- MC4J
- CVS

SERVERWARE
- MySQL
- Apache
- JBoss
- OpenCMS
- Jetspeed
- Samba
- Sendmail

Source: CSC with Flashmap Systems

Interesting Examples

- Google (millions of searches every hour)
- Apache (70% share)
- Mozilla Firefox
- Open Office
- Sendmail
- Postgres
- sourceforge.net

Economist Innovation Award 2004

Award Criteria

"Tonight's awards recognise top innovators whose work has both driven progress in their particular fields and contributed more widely to global social and economic prosperity," said Standage. "The Economist is proud to recognise and thank them for their achievements."

Computing, Linux: Linus Torvalds, Fellow, Open Source Development Lab.

Torvalds originated Linux in 1991 as a 21-year-old computer science student at the University of Helsinki, Finland. Dissatisfied with the MS-DOS (and early Windows) operating system standard prevalent on PCs, Torvalds made Linux freely available for downloading, releasing the source code so that people with knowledge of computer programming could modify Linux to suit their own needs. The software created a huge following, eventually

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Scientific Method

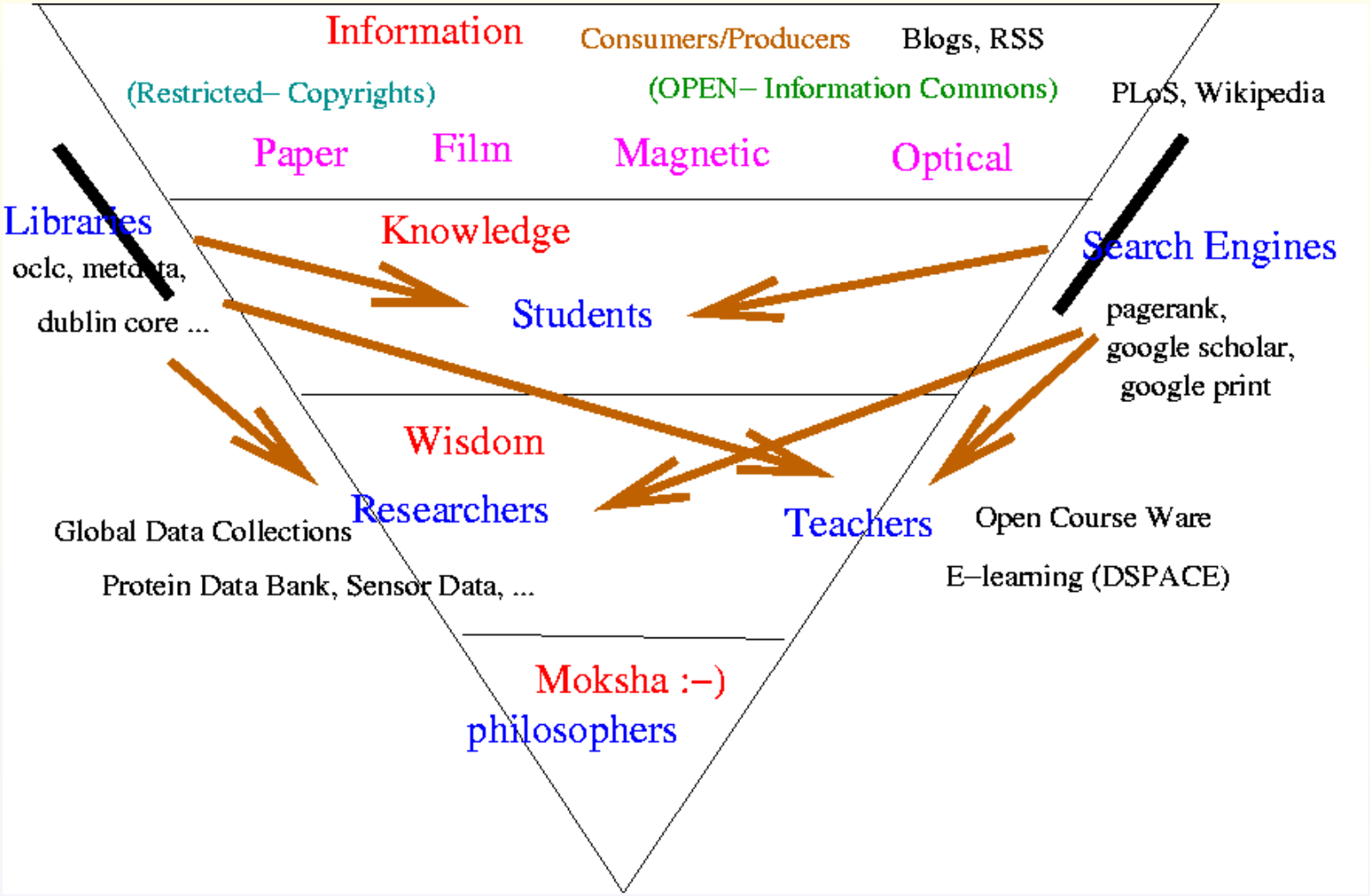
Sharing data and results is the foundation!

Way of Genius

If I have seen further [than others] it is by standing on the shoulders of giants... Issac Newton

Results are accepted only if they can be replicated! (sharing)
Open Access is a must!

Information Hierarchy



Open Access Journals

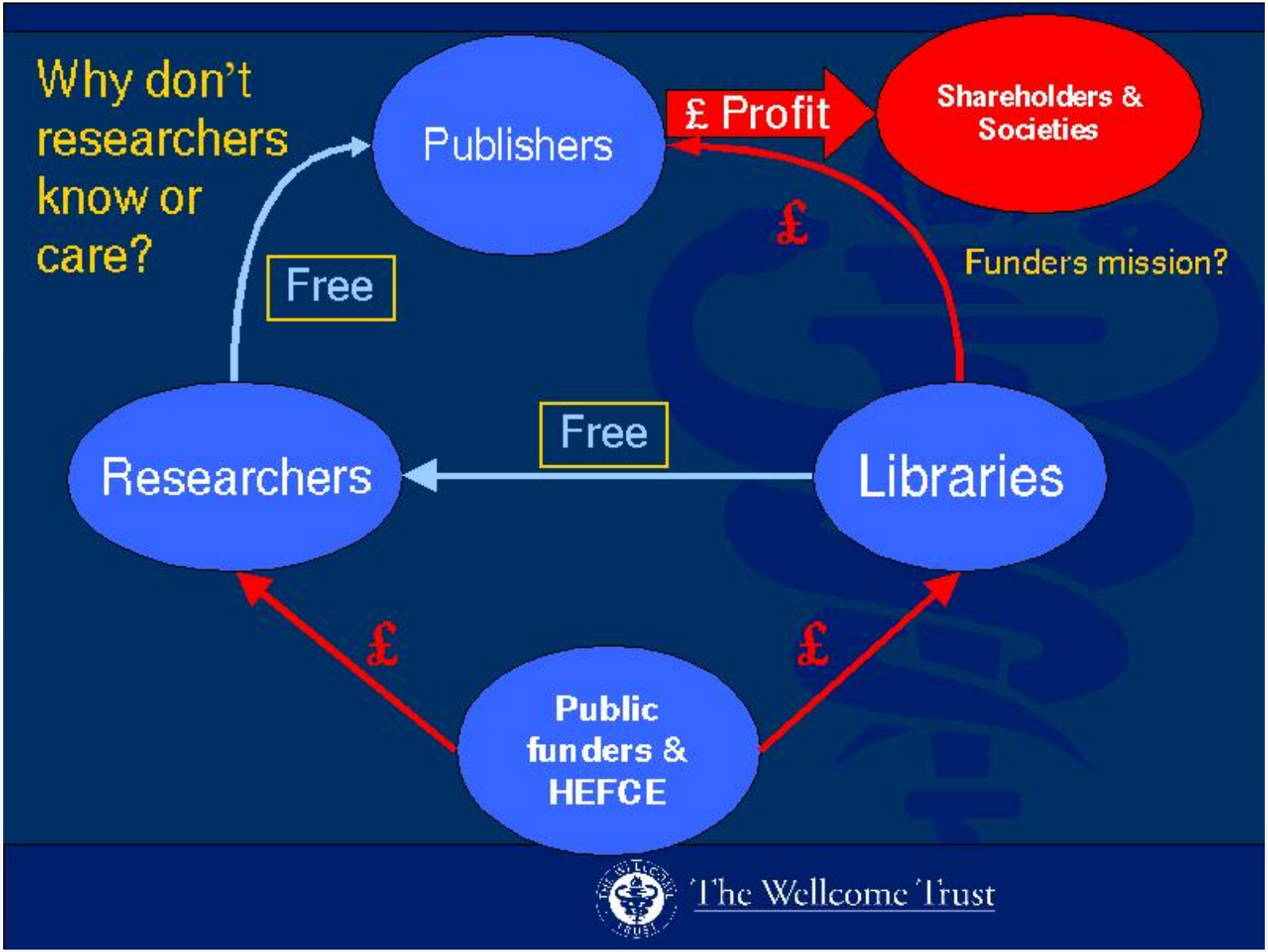
What is open access publishing?

1. Free and unrestricted online access to the research literature and databases
2. Users are licensed to download, print, copy, redistribute, and use
3. Author retains copyright and the right to be acknowledged
4. Papers are deposited in a public database that allows sophisticated searches (such as PubMedCentral)
5. (Bethesda Principles, April 2003)

Why is open access important?

1. Maximum impact for authors
   access to the largest possible audience
2. New ways to access and use literature
   full-text searching and mining (e.g. Google Scholar)
3. Greatly expanded access to research
   for scientists, educators, physicians, the public

Economic analysis at
http://www.wellcome.ac.uk/doc_WTD003181.html


Why don't researchers know or care?
Publishers
£ Profit
Shareholders & Societies
£
Funders mission?
Free
Free
Researchers
Libraries
£
£
Public funders & HEFCE
The Wellcome Trust

Open Access not only for Consumers!

Wikipedia

Main Page - Wikipedia, the free encyclopedia - Mozilla Firefox

File Edit View Go Bookmarks Tools Help http://en.wikipedia.org/wiki/Main_Page

article discussion view source history

Main Page

From Wikipedia, the free encyclopedia.

Welcome to Wikipedia, the free-content encyclopedia that anyone can edit.
In this English version, started in 2001, we are currently working on 559341 articles.

CULTURE | GEOGRAPHY | HISTORY | LIFE | MATHEMATICS | SCIENCE | SOCIETY | TECHNOLOGY
Browse Wikipedia · *Article overviews* · *Alphabetical index* · *Other category schemes*

Today's featured article

Louis Riel was a Canadian politician and leader of the Métis people of western Canada. He led two resistance movements against the Canadian government that sought to preserve Métis rights and culture as their homelands came under the Canadian sphere of influence. During the first, the Red River Rebellion, the provisional government established by Riel ultimately negotiated the terms under which the modern province of Manitoba entered the Canadian Confederation. He was forced into exile as a result of the controversial execution of Thomas Scott, but in 1884 he returned to what is now the province of Saskatchewan to participate in the North-West Rebellion of 1885. It ended in his arrest, trial and eventual execution for treason. Riel was viewed sympathetically in francophone regions of Canada, and his execution has had a lasting influence on relations between the province of Quebec and English-speaking Canada. Whether he is seen as a *de facto* Father of Confederation or as a traitor, he remains one of the most complex, controversial and ultimately tragic figures in the history of Canada.

Recently featured: Brian Close – Diamond – Samantha Smith

Archive – **By email** – **More featured articles...**

Selected anniversaries

In the news

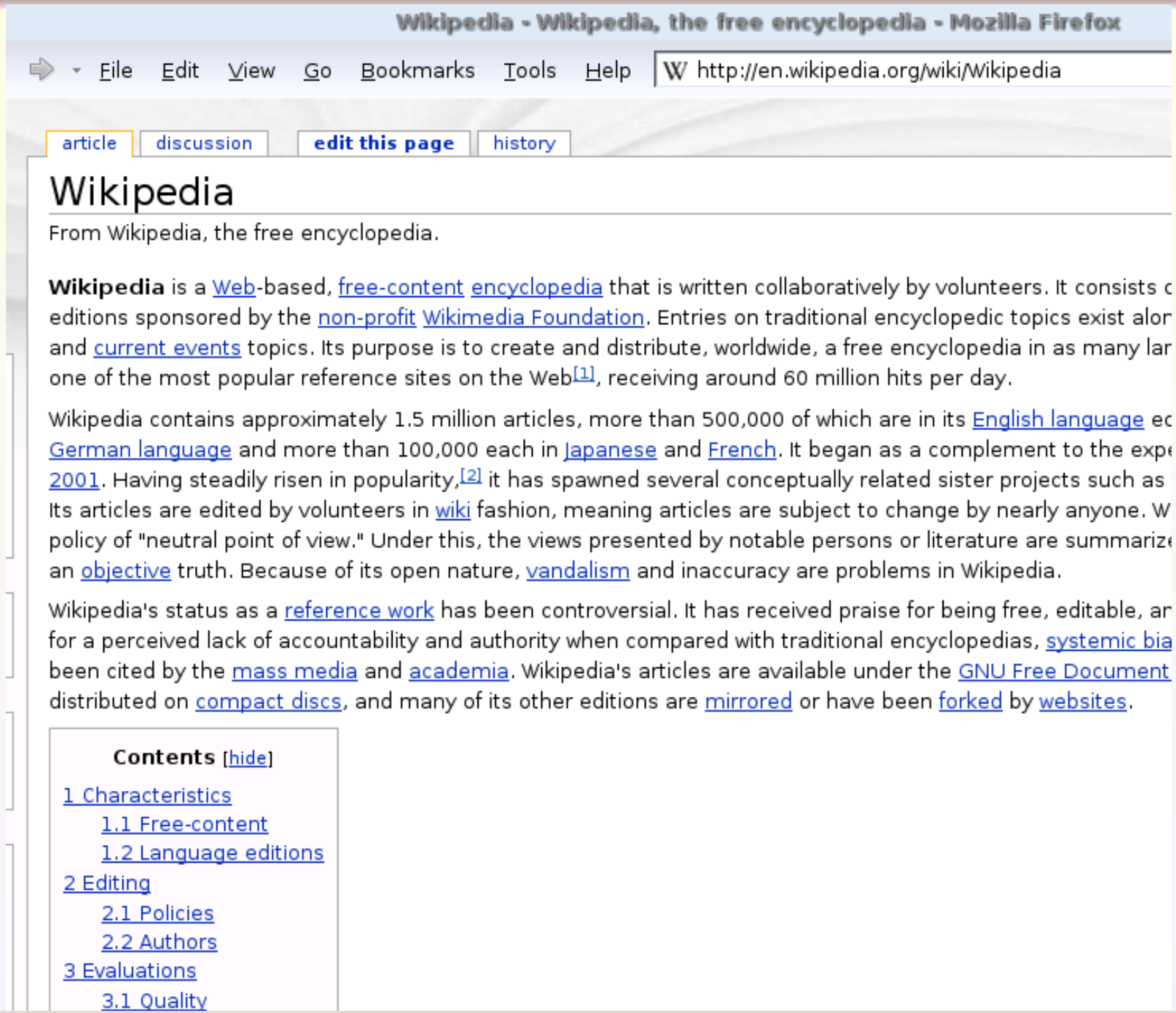
- A planned new **N3 motorway** past the Iri mediaeval Hill of Tara is approved, raising international outcry from environmentalist historians and Celtic scholars.
- The **Sellafield** nuclear plant's Thorp repro Cumbria, UK, is closed down due to a 20-t nitric acid.
- **John Conyers** and 87 other members of U George W. Bush about secret 2002 agreer invade Iraq.
- The wreckage of NASA's ***Mars Polar Lan*** have been found on Mars in images from t

Wikinews · **Recent deaths** ·

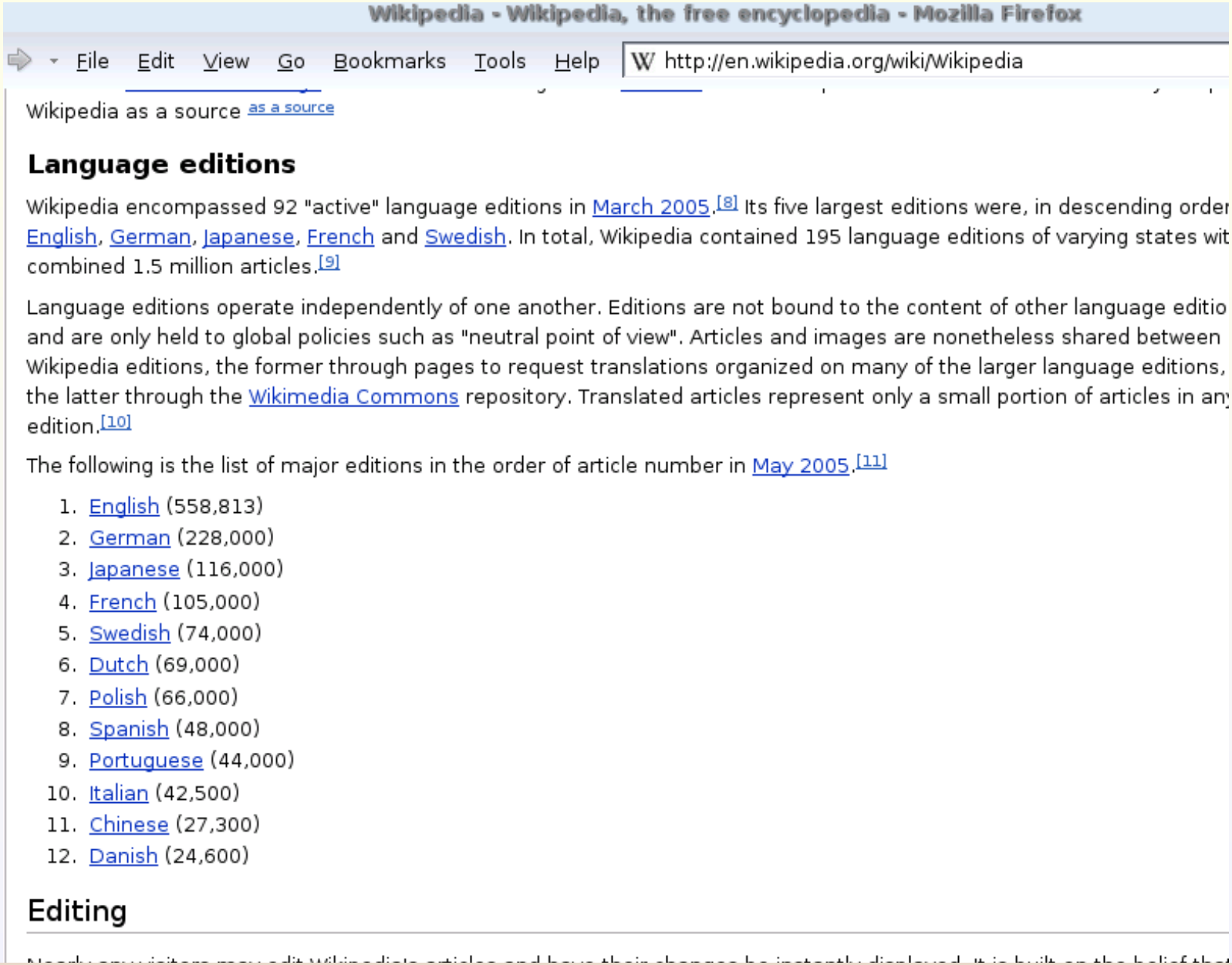
Did you know...

From Wikipedia's newest articles:

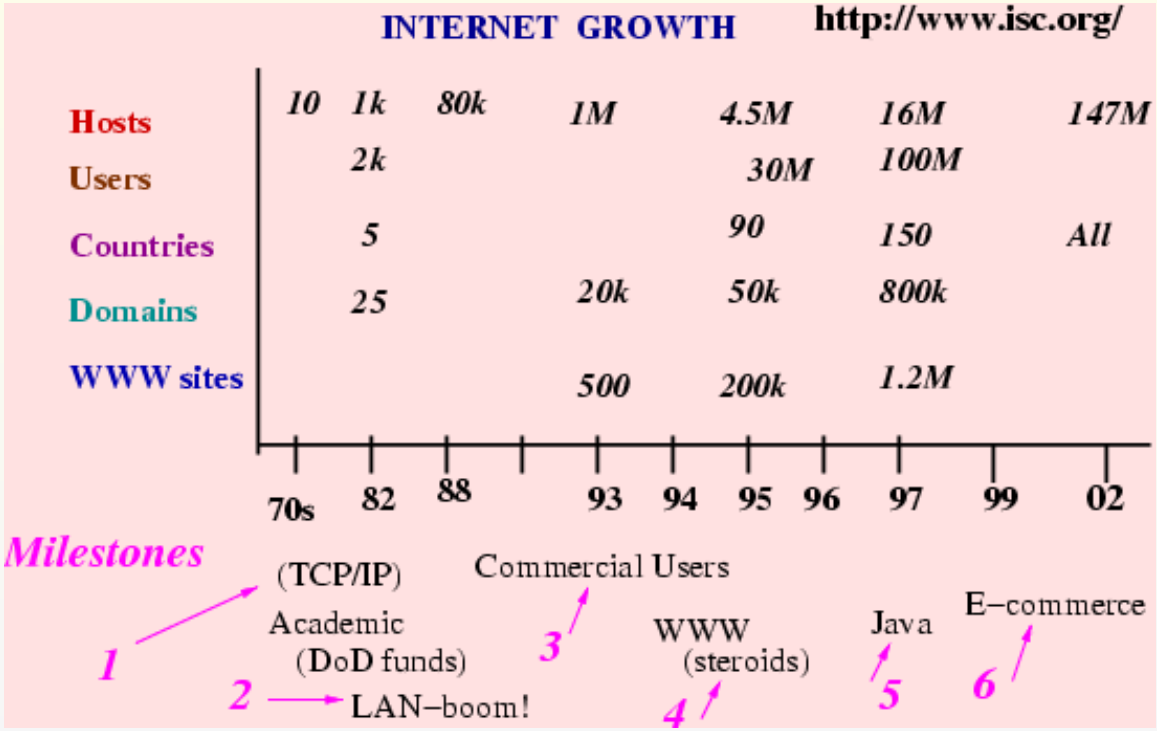
...that ***Starry Night Over the Rhone***, paint Vincent van Gogh in 1888, shows the const Ursa Major over the Rhone at Arles?


Wikipedia - Wikipedia, the free encyclopedia - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://en.wikipedia.org/wiki/Wikipedia
article discussion edit this page history
Wikipedia
From Wikipedia, the free encyclopedia.
Wikipedia is a Web-based, free-content encyclopedia that is written collaboratively by volunteers. It consists
editions sponsored by the non-profit Wikimedia Foundation. Entries on traditional encyclopedic topics exist alo
and current events topics. Its purpose is to create and distribute, worldwide, a free encyclopedia in as many la
one of the most popular reference sites on the Web[1], receiving around 60 million hits per day.
Wikipedia contains approximately 1.5 million articles, more than 500,000 of which are in its English language ed
German language and more than 100,000 each in Japanese and French. It began as a complement to the exp
2001. Having steadily risen in popularity,[2] it has spawned several conceptually related sister projects such as
Its articles are edited by volunteers in wiki fashion, meaning articles are subject to change by nearly anyone. W
policy of "neutral point of view." Under this, the views presented by notable persons or literature are summariz
an objective truth. Because of its open nature, vandalism and inaccuracy are problems in Wikipedia.
Wikipedia's status as a reference work has been controversial. It has received praise for being free, editable, a
for a perceived lack of accountability and authority when compared with traditional encyclopedias, systemic bia
been cited by the mass media and academia. Wikipedia's articles are available under the GNU Free Document
distributed on compact discs, and many of its other editions are mirrored or have been forked by websites.
Contents [hide]
1 Characteristics
1.1 Free-content
1.2 Language editions
2 Editing
2.1 Policies
2.2 Authors
3 Evaluations
3.1 Quality

Why no Indian Languages?

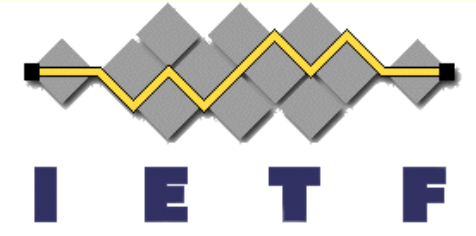


Internet's Growth and Charter



Information **AnyTime, AnyWhere, AnyForm, AnyDevice, ...**
WebTone like DialTone

Internet Engineering Task Force



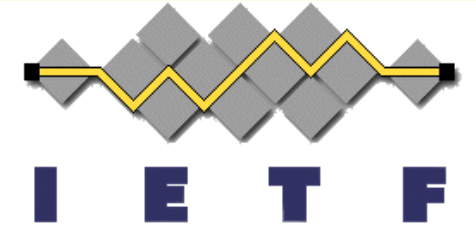
RFC 2026

The Internet, a loosely-organized international collaboration of autonomous, interconnected networks, supports host-to-host communication through voluntary adherence to open protocols and procedures defined by Internet Standards.

Overiew

The Internet Engineering Task Force (IETF) is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual.

Internet Engineering Task Force



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Why Open Standards?

1. Availability
   For all to read and implement.
2. Maximize End-User Choice
   Fair, competitive market. No lock-in to a particular vendor.
3. No Royalty
   Free for all to implement, with no royalty or fee. Certification may involve a fee.
4. No Discrimination
   Do not favor one implementor over another for any reason
5. Extension or Subset
   However, certification organizations may place requirements upon extensions.
6. Protection against Predatory Practices
   Embrace and enhance!

Free Software

http://fsf.org.in/ Richard M. Stallman

Free software

is a matter of freedom, not cost. It is a matter of liberty, not price. The word *free* in free software has a similar meaning as in free speech, free people and free country ... Think of free software as software which is free of encumbrances, not necessarily free of cost. Think of it as *swatantra* software.

Degrees of Freedom

1. The freedom to run the program, for any purpose
2. The freedom to study how the program works, and adapt it to your needs
3. The freedom to redistribute copies so you can help your neighbor
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Open Source Definition

From http://www.opensource.org (Author: Bruce Perens)

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2. Source Code
3. Derived Works
4. Integrity of The Author
5. No Discrimination Against Persons or Groups
6. Distribution of License
7. License Must Not Be Specific to a Product
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Open Source Licencing

.:: **License Index** ::.

License Approval Process
License Information

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*Apache Software License
*Apache License, 2.0
*Apple Public Source License
*Artistic license
*Attribution Assurance Licenses
*BSD license
*Common Public License
*CUA Office Public License Version 1.0
*EU DataGrid Software License
*Eclipse Public License
*Eiffel Forum License
*Eiffel Forum License V2.0
*Entessa Public License
*Fair License

FOSS at IIT Bombay

Just the network first ...

- Inside IIT we have 50 IP subnets.
- Over 5000 nodes.
- All Private addresses 10.x.y.z
- 4 Different WAN subnets
  - 128, 64, 32, 32 address only!
- iptables (www.iptables.org) to the rescue.
- Selective services/machines opened up
  - Incoming ssh to different dept. servers.
  - Outgoing ssh, Yahoo/MSN chat
  - Outgoing port for SciFinder
  - Outgoing ftp from select machines
- Making a good policy is the hardest!

Critical Network Services

- Firewall (Security sine qua non)

  www.netfilter.org and www.iptables.org

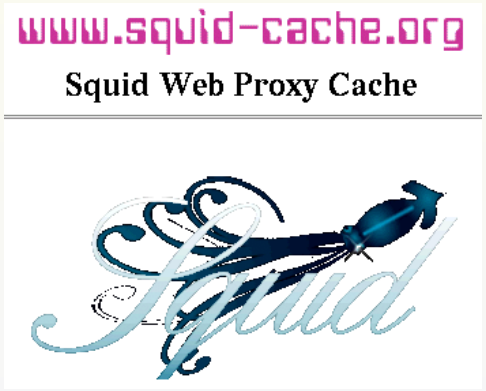
  Free firewall software distributed under GNU General Public License

- Domain Name Service (DNS) http://cr.yp.to/djbdns/
- Directory
- Viru ektrapro.com

Critical Network Services

- E-mail (www.qmail.org)

- Newsgroups (inn)
- Web Proxy



- WWW Servers (httpd.apache.org)

Network Servers Rack

- All Vanilla Intel Boxes running GNU/Linux
- Most services load balanced. Hot Swappable (at the machine level itself)

Is IIT-B only a consumer?

Primarily a consumer of swatantra software so far. But, the tide is turning...

- Varta
  - Authenticated access to IITB newsgroups for our alumni!
  - A very valuable source of input (Chirag Kantharia)
  - Sophisticated HTTP to NNTP gateway
- Secure Online Polls/Surveys
  - UGs can vote on next Film Society movie.
  - 3rd year Btechs can rank Institute Electives
  - Hostel 5 students can decide on picnic venue
- Streaming Audio/Video
  - Based on ffmpeg and Palnatir and mplayer.
  - World Cup better incentive than my lectures!
- MTech Projects
  - HyperSuit (Document Object Model)
  - Arrowsmith (Network Discovery and Performance Measurement)

Freeduc in Schools

- What does it cost to produce?
- How to distribute? (Postman: once in 3 months!)
- What expertise does it need?

What innovation is needed for India?

- Localization!
- Relevant content.

Who can/will do this innovation?
Compare with proprietary software!

Super Highways are good, but why wait for that?
Freeduc is just one example.
eMoviX:
a micro Linux distro meant to be embedded in a CD together with all video/audio files you want, so that the CD will be able to boot and automagically play all files;
MoviX:
A mini CD Linux distro able to boot directly from CD and load in RAM a console interface to MPlayer. From the interface you can easily play DVDs, VCDs, audio/video files Audio CD, internet radios, TV, you name it!
Supported formats- AVI, MPG, QuickTime, MP3, OGG/VORBIS and a few others. See http://movix.sourceforge.net/
Easy, cost effective way to distribute information!
Static vs. Dynamic content

SciLab vs Matlab

- 2-D and 3-D graphics, animation www.scilab.org
- Linear algebra, sparse matrices
- Polynomials and rational functions
- Simulation: ODE solver (ODEPACK) and DAE solver (DASSL)
- Scicos: a dynamic systems modeler and simulator
- Classic and robust control, LMI optimization
- Differentiable and non-differentiable optimization
- Signal processing

Other Educational Sector Examples

- Linux Cluster (16 node) at IIT-Bombay
  - Most Value for money!
  - Molecular modelling
  - Circuit Simulation
  - Aerodynamics
- Online Course Management
  - dotLRN
  - Moodle
- Not just for Science and Engineering

FOSS for India

c|net NEWS.COM
TECH NEWS FIRST

FRONT PAGE | ENTERPRISE SOFTWARE | ENTERPRISE HARDWARE | SECURITY

Track thousands of Web sites in one place: Newsburst

Enterprise Software >> Open source

Indian president calls for open source in defense

Published: July 7, 2004, 10:03 AM PDT

By Dinesh C. Sharma
Special to CNET News.com

TalkBack | E-mail | Print | TrackBack

In another public-sector boost to open-source software, Indian President A.P.J. Abdul Kalam called for his country's military to use such nonproprietary technology to ward off cybersecurity threats.

"Software maintenance and software upgrade is an important issue for defense," Kalam said at a meeting of Indian Navy's Weapons and Electronic System Engineering Establishment in New Delhi last week.

Without naming any proprietary software products, the president asked defense engineers to develop and implement on open platforms. "Even though the required software for the equipment could be developed by the private industry, it is essential that the technical know-how and the architecture is fully available with these services for ensuring provision of lifetime support for the software which may or may not be forthcoming from the trade."

Cost of FOSS

There is no Free Lunch! What is the tradeoff?
Skilled Human Resources versus Money!
Which one does India have in **abundance?**
Which one should we bet on?