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Author(s): Frederick Noronha

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Linux: Open Source Software for South Asia

Frederick Noronha

The talent-rich but resource-poor region of south Asia cannot afford highly-priced, copyright protected software. Software professionals feel an open source code operating system like Linux offers great potential for this region and particularly for India.

The most fundamental way of helping other people is to teach people how to do things better, to tell people things that you know will enable them to better their lives. For people who use computers, this means sharing the recipes you use on your computer, in other words the programmes you run.

– Richard Stallman, Free Software Foundation

WELCOME to south Asia. This talent-rich, resource-poor powerhouse of immense software skills finds its abilities recognised across the globe. But it also finds itself ironically unable to afford the prices of 'legal' software that it very badly needs for itself. How does one get out of such a bind? Piracy is no long-term solution. Young Indian engineers and computer scientists are looking deeply at an unusual solution that has recently arrived on the scene and is fast growing popular. It traces its origins to distant Finland, and is an operating system called Linux, part of the 'Open Source Software' campaign globally.

"Linux is a developers' heaven", says G Sagar (24), a software developer and web-designer from New Bombay. Unlike the software products of Bill Gates and other computing majors globally, this software does not come with an unrealistically hard price. You can buy it legally for a few rupees, as low as Rs 100 or less even. Then, once you have one copy of Linux, you can legally copy the same software across dozens or hundreds of computers. You could also pick it off free from the internet – provided you have time, patience, and internet connectivity.

But many who are opting for it, are choosing it not primarily because of its low (almost no) cost. Linux is a very high quality product, it gives you the chance to go into its innards and work on it. And above all it allows older computers to get a new lease of life since it runs effectively even on slower systems like 386s.

The free software movement as we know it was founded in 1985 by Richard M Stallman. The basic tenets of free software are – freedom to study, freedom to change, freedom to share or distribute, the right to sell free software, and the

principle that the software 'source' has always to accompany binaries.

People want to believe they get what they pay for. Whether it is a new car or television set, it is easy to believe that you get quality if you pay a bigger price. Not so in the world of software. The Linux operating system may prove that, sometimes, the best things in life are free.

Linux is an operating system that runs on Intel-based (and other) computers and works a lot like proprietary versions of UNIX operating systems and Windows NT. It was invented some eight years ago by Linus Torvalds, a student at the University of Helsinki in Finland. Linux's origins are interesting: dissatisfied with his choice of operating systems, Torvalds wrote one that he liked. After he had made the source code publicly available on the internet, a community of developers arose that has built on, improved and expanded his work.

Current estimates of Linux users worldwide put the number of users at between 8 and 10 million. Linux source code (the internal instructions that make up the software) is publicly accessible. This means that there are thousands of developers – around the globe – working often voluntarily on developing Linux.

What does all this mean to India, or the countries of south Asia?

V Vinay is assistant professor of computer science and automation at the prestigious Bangalore-based Indian Institute of Science. He sees many important fallouts. Foremost is its impact on education. Free software allows teachers and students to look into the software and not just treat it as a mystical black box. "Children like to play with things, tear them apart and – if we are lucky – put things back. Free software encourages such exploration, allows interaction with other children, and learning to understand large complex programmes, without inducing any guilt of being a 'pirate' Dexterity in creation and not in usage is crucial if a developing country like India has to create its own niche. Or else, we will merely be followers", he explains.

Eventually, if the dream of computing for all has to be realised, even a conservative estimate of about one million servers at

Rs 100,000 per server, will result in an expenditure of about Rs 10,000 crore on software alone. Using free software will spare the country a huge financial burden, says Vinay. The other major impact of free software which Vinay sees is on the security of the country. "Free software is software that can be trusted as we have the source code", he explains.

Linux is not important only from the cost point of view. It is powerful and robust. It is also flexible and gives you the power to modify. This is important to some; since most commercial software are US-based. "We need something that can be customised to our taste and requirements", says executive editor of the Bombay-based *IT Vision* publication Prakash Advani.

In addition, Linux has a very low cost of ownership, Advani points out. You don't pay per client licence, you don't pay for every upgrade, add-on or features. Once you set it up it requires very little maintenance. As if this were not enough, it is free. "People associate free with low quality. That has to change", says Advani.

Linux, apart from being almost free in terms of price, supports a wide range of what would otherwise be deemed redundant hardware. "In fact I know cases where a 486 is used in networks as proxy, gateway, mail server", explains Sagar, the software developer from New Bombay.

So far, computers in India have been widening the gap between the haves and the have nots, says 26-year old Sudhakar 'Thaths' Chandrashekhara. Something like Linux could change things, because it can breathe new life into old hardware and help bridge the gap. Since Linux does a great job of supporting old hardware, one can get a decent 386/486 machine and have Linux running on it in India for about Rs 10,000 to 20,000, argues 'Thaths'. 'Thaths' is himself an engineer with Netscape Communications Corporation in Silicon Valley. Yet he admits: "Software copyrights are unfair to resource-poor nations like India". He is eager to see a Linux distribution specific to south Asia. "A localised Linux distribution will go a long way in making Linux popular in the various government departments", says he.

Ramakrishnan M (23) argues that Linux is "very, very relevant" to India because we have low purchasing power. "Imagine buying a state of the art C, C++, Perl compiler for any other platform. Not only that, the bug tracking system, the quality of software that you are getting is great", says he. For example, Ramakrishnan works in signal processing. His field has much commercial software available, including the famous Matlab costing about Rs 80,000. "A person like me simply

cannot think of buying it. Now I have the option of working in a package called Scilab which is free (not only for Linux but for all platforms)", says he. "You need not have to work with pirated software anymore. The support is available for Linux in abundance on the internet through mailing lists", says Ramakrishnan. Apart from that, Linux can work with 4 MB ram or even 2 MB. Imagine running Windows NT on a 486/630 MB HDD/4MB ram" says he.

Vivekananda L Baindoor (37) is a computer professional working at Bangalore. Part of the Applied Technology Group of TATA Infotech, their job is to look at new technologies, get into them, study them, use them, develop something in them. Baindoor believes there is a lot of still-untapped software talent in India. "The right way to tap the talent and get benefits for everyone is do what 'techies' do. So far we Indians have provided 'IT coolies' to the developed world", says he. "We found that Linux was promising. We needed to develop something which needs tinkering with the TCP/IP itself. Linux provides the source code for this and hence we got into Linux."

Bangalore-based IISc assistant professor Vinay says: "Linux has an important role... the very fact that it is free software is a good enough reason for me. Deployed on a large scale, Linux will save India a large amount of foreign exchange." But for it to grow, he stresses the need of local language integration. This is the single most important development that needs to be undertaken, says he.

Russell McOrmond (31), an internet consultant from Ottawa, Canada and one of those enthusiastically backing Linux in India, sees free software as a sovereignty issue. "Proprietary licences restrict the use of computing and can be used in a trade war against a country. Most proprietary software originates out of the US, and India needs more control over its policy by the US like it needs a hole in the head." Piracy, says he, is not an appropriate solution. "Piracy is not a valid form of civil disobedience as long as CopyLeft (a system which challenges the restrictions of copyright) is available, and I have no sympathy or respect for people who pirate software for any reason."

"By using Linux, one is safe and his/her conscience is clear that he/she is not using pirated software. It is an excellent tool to enable one to study the theory and implementations of operating systems", says Sachin Garg (26) of the Centre for Development of Advanced Computing (C-DAC) of Bangalore. Garg informs that currently the Indian C-DAC has proposed to develop a super computer based on

cluster computing with PCs using Linux as a starting point. The combination of Linux and the PC will enable these clusters to be available readily and cheaply. Indian government agencies such as the C-DAC – though lacking the publicity of the private sector – have a larger agenda of popularising localised solutions such as Indian language computing. These could be effectively involved with the Linux venture, its supporters argue.

Vaibhav Sharma (21), a computer engineer from Indore, says Linux would "definitely play" an important role in the life of future computer professionals. Computer educational institutions should take to teaching Linux, and government-run institutions should also focus on it as part of their master's and bachelor's degree. "Once any one of this happens, Linux would be powered with at least 10 more rocket boosters", says he. Linux, he says, is now available at a cost of a mere Rs 95, along with popular computer magazines like 'PC-Quest'.

Linux users have already been promoting this operating system from various big and small engineering colleges and institutions across India. "Regional Engineering College, Surat also had the first Indian Linux mailing list called BLUG (Bharat Linux Users Group)", recalls Suman Saraf (23) of New Delhi. Today he is at Hughes Software Systems, where he says close to 500 persons use Linux as their desktops. "Low pricing certainly helps the students and other freelance hackers. Indians and south Asians have a good understanding of computers in general and the open source helps them in understanding the working of the computer better", says Saraf.

"I love to see the look of amazement when a person sees a PC, Mac, Alpha, UltraSparc, and maybe even a PalmPilot all sitting in a row, running Linux. Hmm.. I know a guy who has tons of those scrumptious SGI workstations too", says Nikhil 'Nikk' Datta, pointing to the versatility of Linux to work on a wide range of systems. "It's time to show people why Linux is actually easier to use – without any screwy GUIs (graphical-user interface), or the Windows-like systems which seem to make a computer easier to operate", says he.

At the heart of this drive for promoting Linux in India is a seemingly simple mechanism called the mailing list. This way, one could keep on discussing issues and sharing information, as if one were in a perpetual conference on a particular subject. Linux-India, as the list is known, has done much to push Linux in various corners of this country. But, along the way, Linux-India's success has also become a drawback. By now, it has become a huge and active mailing list, with some

400 members. Each day, you can expect at least 70 or more messages to come your way, as Linux fans across India head home for the evening and another tryst with their favourite operating system. Some are put off by the heavy load, and also the infighting that sometimes comes up, as is expected in any such diverse group. There are many questions coming up on the Linux-India mailing list, and helpful members are quick to come up with replies. Y L Narayana recently asked Linux-India whether there were any statistical programmes available for Linux. "You know, the kind used to do things like analysis of variance and others", said he.

"Linux-India is just a seed which is going to grow into a huge banyan tree. It needs to get more serious people and business people involved", says IT Vision's Prakash Advani. Much of the credit for promoting Linux in India should also go to computing magazines, like PC-Quest, which have been bringing low-cost CDs to tens of thousands of readers across this country. Another commercial computer magazine, CHIP, recently came out with a special issue on Linux.

In Bangalore, former Indian Navy navigation officer U Taranath (40) is an amateur radio operator, who has gone into selling Linux CDs and other products in a big way. "The demand for slackware is so good that we started looking out for other Linux developers", says he. "Computerisation is important for any country, company or organisation. And it should happen within its own financial resources", argues PhD student Vinod G Kulkarni (31) of Pune.

Linux is different. Apart from significant gains in not having to pay for software, users benefit from the fact that the same old computers remain productive for many years even with relatively more complex software. This can be a major competitive advantage for any company, argues Kulkarni. His desire is "to see Linux proliferate", and is working on some source software products.

It can be tough convincing someone that the best things in life can, indeed, be free. Interestingly, at Netscape – the firm behind one of the world's most popular internet browsers – Thaths' own installation of Linux was what he terms a 'guerilla operation'. As he explains: "I installed Linux when my boss went on a week's vacation. By the time he got back things were running flawlessly and he could not complain." Others have had different experiences. Says 23-year old Prabhu Ramachandran of Chennai: "I had been using Linux at college and was impressed by the fact that I could do my work on it for free." More so, he points out, because shelling out

\$100 is pretty big (for us poor third worlders) for really buggy software which doesn't even give you one-thousandth of the facilities a simple \$2 CD containing Linux can give you.

Indians, and south Asians generally, Ramachandran argues, are also a very intelligent people and hence would certainly like software that doesn't assume a 'brain dead user'.

Gurunandan Bhat of Goa University's physics department played a key role in setting up internet facilities here. In 1995, when getting access to the internet, they decided to go in for a UNIX-like operating system. Says he: "In those days, the only place where Linux was installed at least in a production environment was the National Centre for Software Technology in Juhu, Bombay. So we borrowed a backup of their Linux installation (the kernel version was 1.0.2, I think) on tape. It might now sound funny if I told you that it took us more than two weeks to get it running." Till now, Goa University's 486 computer has been working for four years without a break, though the number of users has gone up fourfold.

Arup Bhanja of Calcutta recommends a fourfold strategy to boost Linux in India – showcasing Linux technologies available, stressing the lower cost of ownership, informing users about the pitfalls of using pirated software, and extending Linux to schools and colleges.

In India, increasingly computer users are getting aware of how they are squeezed between astronomical software prices, the falling value of the rupee, and allegations that those who cannot afford to pay are 'pirates'.

Vinay questions the fairness of copyright laws. "Fairness and copyright is an oxymoron. They are meant to protect the haves. Seen within the context of other haves, the laws are fine. The problem is when the same laws are applied to the have-nots as well. The recognition that software is different from other manufactured goods and therefore requires different laws has not yet sunk in with the US government." Vinay is a researcher in theoretical aspects of computing. "Software copyright laws are fair only to the software companies which try to enforce them. Not to the users. The degree of unfairness increases as we think of the 'developing' countries", says Vivekanand Baidoor in Bangalore. 'Legal' software can also prove costly in more than one way. Users have to pay high costs whenever they upgrade.

If legal software becomes mandatory, most people would cease to use computers and usage would go down harming us more. On the other hand, if India continues

to pirate software, the country gets a bad name in the intellectual property corridors worldwide, argues Arup Bhanja (28), who worked on various software projects in India and abroad before settling down in Calcutta with his internet consulting business offering low-cost value-added services in the internet media. "When software is developed in India at lower costs (offshore development) and sold all over the world at high price who is benefiting more?", asks Arup Bhanja.

"My belief in copyrights has been influenced heavily by Richard Stallman, who says that a book or a piece of software is a global resource, and if you prevent people from using it you're reducing global wealth", adds Raj Mathur of Delhi. Raj Mathur puts the argument this way, "just one C compiler for Windows may cost me the equivalent of one month's salary in India, while in the US I could get it for, say, one-fiftieth of my one month's salary. So the problem is with the buying power that we have." If Coke can sell itself at far lower prices in the third world than it does in the west, and the same holds true for books, why don't software companies lower their prices in this poorer part of the globe, he asks.

With a product like Linux, it is often not just a question of costs alone. Mukund who manufactures industrial electronic products from Nagpur does not think that the 'free' tag on Linux will make any difference. After all "in India, 90 per cent PCs run on pirated software", he argues. But Linux will be accepted for its stability and compatibility. India's rich software talent could also give a boost to Linux, he feels. "We are all poor people and believe in piracy only (look at China). So whether the software is copyright, copyleft or open source does not matter to south Asians", Mukund argues bluntly.

K Arun, a 19-year old biochemistry undergraduate from Chennai says Linux interests him "primarily because I'm a neophile, and love tinkering with stuff". He also points out that there is a huge amount of scientific software available for UNIX/Linux. "Indians are definitely contributing to the growth of Linux. In fact there are a few how-to's written by Indians which come as part of distributions. But I am not too sure if it is by expatriate Indians in the US or generic Indians", argues software developer G Sagar from New Bombay.

Regions like south Asia could surely support the global Linux effort. They could do so by developing applications, putting money into Linux-related ventures, supporting Linux (either for free or for a fee), and advocating the use of this unusual operating system.

"Putting money into Linux-related ventures has started to happen. Look at firms like Pacific Hitech and G T Enterprises in India (a firm in Bangalore which is popularising Linux by aggressively selling its low-cost CDs and software). But this is still on a small scale, possibly because of the local economic situation and the general low per capita incomes", says Raj Mathur (38) of Delhi, who has been in the IT industry for the past decade and a half. Indian firms like HCL have announced Linux support initiatives. Bangalore-based C and B Consulting is already doing it, Mathur points out. Linux-India's list-maintainer Arun has published a few utilities for the popular Linux application, called KDE, says Chetan Kumar (23), another software engineer in an infotech company in Bangalore.

"With the kind of internet services available in India, it might take some time before a (Linux) programmer base develops in India", says Goa University's Gurunandan Bhat. He feels that since most universities and colleges have yet to get even a decent internet link, it is no surprise that our biggest potential developer base is lost to us even before we get started. In view of Netscape's Sudhakar Chandrashekharan, people of Indian origin (NRIs) have made significant contributions to the Linux effort. But people in India, in general, have been consumers of the efforts of others. "Not that there is anything wrong with that. In the open source mode of development a large group of savvy users is as important as a group of developers", 'Thaths' Chandrashekharan argues. And as the internet connectivity in schools and colleges improves, more and more students – who are the primary sources of innovation in the rest of world – would start contributing to the Linux effort in India.

Some Indians, like Ramakrishnan, already find the idea of open source software to be the "most revolutionary idea of the decade". Everyone interested in Linux should read about 'The GNU Project', as outlined on the website www.gnu.org. "I have read it several times", says Ramakrishnan. He is doing his MS in communication systems from the IIT in Chennai. "In future I want to contribute something for Linux software. I would also like to contribute monetarily towards FSF as and when I get a decent job", says he.

"The community spirit must be fostered by tapping the young computer users in schools and colleges", says 32-year old Bhyrava Prasad, country manager for Insight Solutions India office in Hyderabad. He is gushing in his praise for Linux: "The future Linux in the world is brighter than a thousand suns."