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ASIA-PACIFIC REGIONAL INTERNET GOVERNANCE FORUM

NEW DELHI, INDIA

13:30

04 AUGUST 2014

CONNECTING THE NEXT TWO BILLION: THE ROLE OF FOSS

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 >> I invite all the dignitaries to occupy their respective seats. Honorable guests.

 >> MISHI CHOUDHARY: A very good afternoon. I'm going to blame the distance for the numbers in this room. It's too far.

 Welcome to this panel on free and open source software, which now talks about connecting the next two billion, the role of free and open source software. The fundamental requirement for a Democratic and free society in which we are all surrounded by and dependent upon technical devices, only if controlling these devices is open to all, we have free software, can we balance power equally.

 FOSS has now assumed even greater significance in light of revelations related to arbitrary surveillance conducted by the United States. Free and open source software can be used to build shared community infrastructure that will protect users from privacy abuses. As most online operations run on free software, there is also a need for greater collaboration between the industry and the free software community, so as to ensure security and robustness of the infrastructure.

 We have amongst us some really, really great panelists who are at the forefront of activism as well as usage of free and open source software. We are going to talk about this new way where server client architecture moved on to a new paradigm of Cloud to mobile. And we have amongst us, through remote participation, Rahul De, the Hewlett-Packard Chair Professor in ICT for Sustainable Economic Development at IIM Bangalore.

 Dr. G. Nagarjuna from the Free Software Foundation is not with us and he could not participate remotely either.

 We have Prasanth Sugathan from SFLC, India.

 We have Mr. Sunil Abraham, the Executive Director of the Bangalore based research organisation, the Centre for Internet Society. Sunil has also been a social entrepreneur and a software advocate for I don't know how many decades. Maybe his gray hair can tell you, which is not very many.

 And we have S. Ramakrishnan, director again of the Centre for Advanced Computing. He has been the group coordinator for convergence, communication and broadband technologies. Before assuming charge as the executive director of CEDSC, he was also the founder projector director of ERNET, Director of the National Centre of Software Technology and head education research and technology, and founder of the Media Lab Asia.

 This conference was organised by the Free and Open Source Software Centre, which is a research institution of the Government of Kerala.

What we do want to cover is a variety of issues out here. The importance of free and open source software in this new world.

 When some people have said that when software is a service and that is the way of the world, nobody receives software. Then what is the relevance of these licenses which mandate freedom along with software?

 Yes, open source does not matter anymore. But what matters is free software. Free software which is open source, plus freedom. As we like to say in our community, Richard Stallman is right. Freedom is what matters. The rest is just source code.

 What we must do is apply free software to the problems that we have today, which is unfree services, delivered in unfree ways, which are deteriorating the structure of human freedom. Like a lot of unfreedom, the really underlying social process that forces this unfreedom is nothing more than perceived convenience.

 I'm Mishi Choudhary, founding director of SFLC India, a New Delhi based legal services organisation, and I'm going to discuss this now with our panelists. I'm going to give all our panelists two minutes each to delve upon whatever they think about this issue. And then we will take -- we will go and discuss certain specific issues, and I will try to steer the conversation towards some questions which we think need to be addressed, especially by the ones who are at the forefront of the free software movement in India.

 I will start with professor S. Ramakrishnan.

 >> S. RAMAKRISHNAN: Thank you, Mishi. Hello.

 Thank you, Mishi.

 As the Conference itself talks about, achieving the two billion. India is the specific case of often talked about bottom of the pyramid, which today is, one can say, 300 million at the bottom of the pyramid and some class of about 800 million in the middle class. And top 150. So put together today we are somewhere in the 450 million touching the Internet. In some ways, we have still a long way to go.

 As you know, we have mobile touching more and more people, mobile Internet specifically, and with sub 5000 Rupees, we have already reached that stage. You can expect that to make a big difference. And the India language Internet and the localization, eCommerce, eGovernance and banking and finance and more recently education, health applications, and of course entertainment. All these put together under technologies of cloud and mobile applications and content, are they all enough to make a difference? I think that is one more key element which is perhaps missing is the FOSS element. To make it a critical disruptive point for India to teach the big bang of touching the bottom of the pyramid or the large Indian -- to make India a success story, you need to touch all these numbers.

Then suddenly you'll find the power of India will be made possible.

 So that is the key topic. Therefore, I believe particularly the variety of applications which are directly relevant to the bottom of the pyramid can only be seen, in fact will be seen only through the FOSS.

 >> MISHI CHOUDHARY: Sunil, do you want to talk now?

 >> SUNIL ABRAHAM: So I'm a slightly more pragmatic software advocate. Unlike most free software advocates, I would say that Apple is the most successful example of a free software based business model. And one of Stallman's quotations that I have great fondness for is that "everybody has the freedom to be a slave." We don't want to liberate you from the proprietary software and then take you to free and open source software. We feel that you have the right to use proprietary software, the right to be a slave.

 So since we are at the APrIGF, we have to ask whether all the four stakeholders have an equal right to be slaves. Clearly, citizens and Civil Society can choose. They should be able to do whatever it is they want. We can't force their hand.

 The technical community insofar as we understand them here at this meeting is mostly concerned with the development of standards. Unfortunately, so far most of them have said that we will use open standards. Open standards without any royalty implications for associated patrons allow for the blossoming of free software. So they are really an ally for the free software community so far.

 Moving on to the next sector, private sector, they can choose either way, just like citizens, we can't force them one way or the other.

 But the Government, which spends taxpayer money, they have limited options. The public should not be required to pay twice for the same software. Therefore, when the Government funds the development of software, that software has to be licensed under an appropriate free and open source software license.

 Only when such software does not exist and it is much easier for the Government to push commercially off the shelf software can the Government use its money to purchase licenses for proprietary software. So fresh development always is first for the government. That is a key part of getting Internet adoption and governance.

 Thank you.

 >> MISHI CHOUDHARY: You also talks about and probably highlights the City of Munich saved 23 million Euros over the last ten years because of the switch to Linux. Satish, do you want to talk about this now?

 >> SATISH BABU: Thank you, Mishi. But before I get into the economics of free software, I'd like to touch upon the reason why we said this workshop should be titled as the second billion, instead of just connecting the next billion or two billion. What is the relevance of two billion? We believe that connecting the initial billion, the next billion and the third billion are going to be fundamentally different. The first billion was a kind of the cream of the users, people who already had access to computer, people who knew how to use computers. The second billion will be people who are new to computer, perhaps they have a mobile phone, perhaps know a little bit of English. And the third billion is going to be really a set of people who have been excluded so far not only from compute, but from many other technology access as well.

 And also we are talking about people who are either, you know, very poor, who are the aged, and therefore connecting the second billion and third billion bring in challenges which did not exist in the case of the first billion. So that is the reason why we wanted the title of connecting the next two billion. Because the challenges are going to be very different, and I hope to be able to elaborate some of the challenges as we have the next round. Thank you.

 >> MISHI CHOUDHARY: That is correct. We need the doggedness of FOSS communities and the encouragement across genders so we can use FOSS to get the next two billion online.

 >> PRASANTH SUGATHAN: When I first started on FOSS, I've got a lot of gray hair, Mishi.

 So, so not many people heard of Linux or free software. But now when you look at it, you have something like 1.5 million activations of Android mobile devices on a daily basis. And we're almost -- like 98 percent of the computers, they work on free software. So across the specter you have free software which is powering the Facebook, the Googles around the world. So you don't have to describe exactly what is free software anymore. As rightly pointed out, the next two billion will come from mobile devices and others, people who access mainly through devices like through mobiles and other technology that is available. And that will mean a lot to countries like India. In fact, this is going to mean a lot for a country like ours, because we can have new start ups, which could use free software which is readily available and not worry about licensing costs and expensive hardware.

 So you can build out normal things available at much lesser prices and that could mean a lot for our country and other developing countries like ours.

 Thank you.

 >> MISHI CHOUDHARY: That is correct. Now, when we live in a cloud to mobile FOSS in the Android form it now dominates the mobile field, and we are noticing immense investment by Android. But then we see fragmentation, which we do not like.

 I want to take the discussion to Rahul De who is joining us via remote participation. Do we have Rahul De here? I believe he is supposed to join us through remote participation. He is already online and waiting.

 Even if Adobe Connect works on Linux, anything with that name makes me a little queasy.

 While we check for Professor De, I'll use the time of the panelists out here and ask them some questions.

 Prasanth mentioned about next two billion who will be accessing the Internet will be different from the first who got online. I do want to get into this a little and I want to see what is the relevance of FOSS as an access enabler. What are the community projects you think which are already in the making, which address the various problems which Satish, as you say, whether it's infrastructure or localization or access for the disabled, that FOSS is better able to address the proprietary software.

 >> Satish was talking about the next billion. This comes from the next two billion. It could be the nature of the people who -- where the application scaling can be a challenge. Or it could be user interface which could be a challenge. So even that, I want to look at the case study of the health sector in India. Because health is probably all over the world, because health has been sort of a lag guard application area. And you talk to any doctor, he is not at all ready to touch a keyboard. So you find that different kind of interfaces are required. That's where the so-called smartphone and user interface is going to be very different. We are just seeing already in a big way a smartphone showing many of these possibilities. But if you look forward, it can be ominous and not just the Question of voice interface, but also even in the case of not only voice, but in terms of visual interfaces.

Enormous possibilities, because everything is going to be there for him to act without the keyboard. I have seen already that beginning to show. But we know that adoption by doctors will be much lower.

 And second is even from the point of view of back end, health is many ways a sector where public interest, as was mentioned by another panelist, also is a thing where the Government is going to be spending from India all over the world in a bigger amount.

 So there again is one more business case why we need FOSS to play a big role. So as I see going forward, I think that the demonstrable case of benefits can be shown by FOSS. Even when a new chapter is going to be opened up, the whole new application chapter is virtually seriously going to be born only in the next so-called one or two or three years, and for the remaining two billion or even more. And this two billion quite often people hinted at people who are disadvantaged. What do you talk about a doctor, is he disadvantaged? In some ways, yes, because he is not ready to use the technology that you offer to him now. Therefore, I think that there is a definite opportunity for a new technology with Cloud mobile, but also new user interfaces and FOSS to play a very big role on that.

 >> MISHI CHOUDHARY: Professor, the virtualization technology that were in the Cloud, there was academic and individual inventions. So FOSS made the Cloud. Now that we are getting into something different, which is how the Cloud is getting to the user, what is the specific role you are saying? I'm trying to get to the answer that what is it that FOSS does so that it makes it easier for the users to adopt?

 >> S. RAMAKRISHNAN: Basically, I'm referring to not just the application being shown by the FOSS, FOSS methodology, but innovation, also implemented through FOSS methodology. Already academia has indicated a few through a hospital kind of set up.

 >> MISHI CHOUDHARY: So I believe what you are referring to is that the ease of tinkering with anything that is based on free and open source software makes it far more acceptable and easy to adopt. That you can customize applications, because it is easy to do.

 I want to come back to Sunil what you talked about, freedom to be a slave. What you were getting to was that anything which the Government is involved in, in any Government projects, that you want free and open source software to be mandated. For everything else, it's the choice of the consumer, and you want the consumer to choose and do as they please, which is fine. Absolutely.

 But I want you to take this further and elaborate on how you want the Government to see the benefit. Although the Government of India has an open standards policy, the high courts and Supreme Court runs on free and open source software, but without realizing it. What are they doing, what do you want them to do?

 >> SUNIL ABRAHAM: So let's take a specific case study, which is the needs of the disabled. The proprietary text to speech engine available on most desktops today costs a thousand dollars. So suppose the Ministry of Social Justice has a scheme, and it does, here in India, to give 50 percent subsidy for the disabled for the software that they purchase. So with a million dollars of subsidy, all the Government will manage to do is serve the needs of 2000 visually impaired persons in this country. That is a very small impact.

 Additionally, the proprietary text to speech engine only speaks English and two other India languages.

 If, on the other hand, from that very same pot of money or some other pot of money, we spend a million or two fixing nonvisual desktop, which is a free software is screen reader, and eSpeak, which is a free software based thing, then once that is done in 16 languages, the same ministry can give free software and make a difference in the lives of millions of visually impaired people. So free software not only allows the community to scratch its own itch, but often the community doesn't have the technical competence to scratch, then the Government plays a very important role in producing a market dynamic and allowing innovation to blossom in the open or free domain.

 >> MISHI CHOUDHARY: The Government, in terms of adoption not only saves money to the Government, but also allows it to take -- allows the authorities to take their policies to a much wider audience with a very, very small budget.

 I do want to point out something that has been mentioned, raspberry pie, which is a very interesting project, credit card single board computer developed in the UK and now runs as a free software project, has a nonprofit foundation, and the intention is to stimulate the teaching of basic computer science in schools.

 Prasanth, you have done this for a long time. The way that Sunil said about access for the disabled and how a small pot of money can help make the dissemination much more possible. What do you see in the sector of education or any other sector, the role of projects like raspberry pie.

 >> (Off microphone.)

 >> MISHI CHOUDHARY: Well, let your minds be free with free and open source software. Satish, innovation and austerity is something that we are all striving to do, especially in developing countries like ours, where money is scarce, innovation is a requirement, where we are moving from not just being the service industry and software but we also wants to do various other things. Where in the education sector do you see the FOSS? Where do we see that this is the enabler.

 >> SATISH BABU: I will come to the issue of raspberry pie and so on. But the Question that was owes posed earlier about access and what are the technologies that are there, or what would be required if you are to connect the next two billion people. Obviously the mobile platforms will be the foundation of such a movement. Because they are the most likely computers that most people will ever have, especially at the bottom of the pyramid. The problem with mobile is that I do not consider either Android or iPhone to be really free from a user perspective. There are formidable challenges to making a complete free mobile operating system. This is well-known for quite sometime now and there are efforts at trying to sidestep this whole issue, whether it's tech nology condition the phone which have different operating systems which are different from iPhone or Android.

There are new platforms coming up, which need encouragement, like Firefox, window touch, the applicant, which is a completely free operating system is coming up. Or the Android open source project, which is trying to extract open source from the Android platforms.

 Now, that is a bare minimum and I think the mobile has to be the Foundation for access enabler technology stack.

 There are also some innovative things happening in this space. Raspberry pie has opened up recently, to something called the open source hardware, which holds a lot of promise because it encourages grass-roots level innovation in hardware. Something like what open source did to software maybe ten years back, today it's possible in hardware.

 Google has a very interesting project called ballooning, which is about a bunch of balloons, which are going to provide connectivity. It will not be okay for us -- they are piloting this in the world. But this is someone is introducing a blimp-based technology.

 We have a lot of things on the ground for mobile things. But the point is that there are some situations where we may require this out of the box thinking.

 One thing is a tsunami. Sometimes a wave comes and blocks out the mobile towers. What are you left with? You need technology that will provide technology for different people, rescue efforts. So no idea should be kind of considered as looney, because they might have a role to play.

 Coming back to education very briefly, I think there is a move overall in the world to start computing or teaching computing at the primary school level. Now, this is not necessarily on a device. Because we can teach the basics of computing without any device at all and people are now getting started with that thinking, but raspberry pie and the open source hardware device are actually one such thing which can be very easily decentralized. And the Government is thinking about distributing 1000 raspberry pie units to schools. So the logic was look, these are kids who are born into the technology gender. They are the Internet generation or the technology generation. So computing is not at all foreign to them the way it is to some of us in the older generation, the digital immigrants as opposed to the digital natives.

 So I'm sure that, you know, a bunch of innovative things are possible, with without computing devices. But fundamentally all of these are under pined by open source. I'll stop here.

 >> MISHI CHOUDHARY: What I want to stress about certain projects which were actually started, whether it's an alternative, whether you call it Android fragmentation, signage and Mard, which is an open source software, it's based on the Google open source operating system. For us free software enthusiasts, we thought we would put freedom in everything and then we will turn freedom on and everything would work. It is in everything that you have right now, tablets, television, set-top boxes or any other device that you can think of. It's been turned on to some extent. But there is definitely some hindrance here or there, and I do want to bring out what is happening. This is also to Sunil's initial comment about why Apple is the most successful user of free software, although I would say there is a difference between 0E7 source and free software.

But let me step back and ask all of you. In this next two billion, we understand that cost wise this is going to be very effective. But why is it that users should care about those devices which run on free and open source software and not some shiny devices which are following the cult of the great king of the under and not being interested in the first thing which is available. Do you want to start and then we will take everybody there?

 >> SUNIL ABRAHAM: So this is a good Question, based on which we can develop or understand a critique of both free software and the multi-stakeholder model. The promise of if free software is given enough eyes, all bugs are shallow. This is the promise of free software.

 The gold standard multi-stakeholderism is apparently practiced by the standard setting organisations. And again, it is supposed to be a Meritocracy and it should not be possible for the richest Government on the planet, the American Government, the Government with the most number of mathematicians on their payroll, to compromise open standards that are being discussed at NISD. This should note be possible. But in what seemed to be an open inclusive participatory process with all the different stakeholders represented, the process was gamed and vulnerabilities were introduced into open standards, which are also implemented by many free and open source projects.

 So citizens must use free software if they are concerned about their Human Rights. Free software is the only way you can empirically guarantee that your rights are being projected. However, as our examples demonstrate, even heartbleed is an example of a free software project where everybody thought somebody else was watching. This phenomena is called Cloud stamping, and vulnerability got dlu. So I'm not making the argument that per se free software will always protect your Human Rights. But if implemented with the right letter and spirit, and if sufficient amount of public funds are also available to allow greater participation in the development of these standards and their associated projects, then citizens, the global citizenry, can be sure that their rights are being protected.

 >> MISHI CHOUDHARY: The heartbleed crisis which took place in an earlier part of this year. But it is correct that we expect and now we are -- it's something to celebrate that we hold FOSS to a much higher standard. At least the vulnerabilities come out and we are told with proprietary software we would never know. And what Sunil rightly said about at least one part of it, amongst other good things, is the initiative called the core infrastructure initiative, where people who rely on free and open source software also understand that FOSS needs substantial support in order to be able to do its job. But the very fact that it is easy to recognize, identify the problems with FOSS and correct them makes it far more superior than what proprietary software perhaps offers.

 I'm going to try and use an Android based phone now to get professor Rahul De to join us from Bangalore and let Rahul present his part of the presentation.

 Rahul, are you with us?

 >> RAHUL DE: Can you hear me?

 >> MISHI CHOUDHARY: I can. I hope that everyone else can.

 >> RAHUL DE: (Off microphone.) Which enables this. So I'll -- this is addressing the questions you addressed, you also raised the one about, the Question about surveillance and the ability of large Governments, of Governments around the world, as Sunil was mentioning, to surveil everything that we are doing. Yes, and that is a threat. And the way to go around it of course is, as you said, is to address it through legislative action, through local reaches for ourselves.

 I'll say one thing. If people are watching us, we can also watch them. And here's where free software makes a huge difference, a large difference. And even in this era where Cloud seems to be the happening thing, we have to insist that at least on our local devices, on the hardware that we have, because free software is available so that we can see who all have access to what we are doing. This is easier said than done, but I suggest that it is a very distinct possibility.

 I will stop there.

 >> MISHI CHOUDHARY: Thank you, professor De. He is the professor for ICT in sustainable and economic development in Bangalore. He has a Bachelor of Technology from the technology of Delhi. MBA from Delhi. Graduate of business from Pittsburgh USA and sits on the board of FSCIN. And has been involved with the software. Do you want to talk about the project that Professor De was mentioning and the study that Professor De is doing and how that relates to this?

 >> SATISH BABU: So the free and open source software communities talk about the four freedoms. I'm not going to elaborate on that but I'll talk about the fifth freedom. The fifth freedom is supposed to be cost. Now, cost is actually a barrier in many situations. But free and open source software, due to a variety of factors, makes the cost of software come down significantly.

 Now, early on this was debated through several studies in the form of the total cost of ownership, which has been subsequently resolved. And now it's clear that the free and open source offers a different regime. One of the major beneficiaries in India, is the provincial and central Government. So Rahul De who just spoke and my organisation are doing a study on free and open source adoption for Governments in India. Two of them who are kind of poor, considered poorer Governments, two of them are reasonably well developed Governments. So the comparison that is being made is what has been the benefit of some of States, like where I come from, the State of Kerala, which is considered at the forefront of the adoption of open source, in 2001, the first in India.

 So the study, Rahul is coordinating the study and the initial findings of that. There is a significant savings arising out of this use of free and open source software by these Governments.

 >> To an earlier Question about -- which Sunil also talked about, lest we take FOSS is the only way even that should be put through a glass, to analyze.

 In terms of infrastructure for many other things, if the Government were to sort of -- if you had a choice of let us say multiple proprietary, and typically why do the critical roles Free and Open Source Software plays is quite often people are locked up in multiple islands. That is a serious problem there. In fact, that is one of the things about open  standards and those things. Standards is the way to go. But who is going to be the arbitrator for that?

 So this is where as long as you have a choice of Free and Open Source Software as one of the choices, that itself changes the complexion of the game. Which not only you solve the problem of so-called reference platform against which you can say otherwise people will lock you in. And if they are not interoperable, then you have a problem with A or B. Open choice makes the choice.

 Second is you want to grow the scale. Again, open source gives a clear choice. But I think whether it's the form of -- and even when it comes to infrastructure, especially as Satish was pointing out Government cases, then the Indian case study from 2002 to 14, whether it's eGovernance or any other sector, education, when it comes to this, you see that Free and Open Source Software brings intangible benefits in terms of -- usually by offering a choice as opposed to proprietary software.

 >> MISHI CHOUDHARY: Thank you. What I'm hearing is the consumer wins against and does not mandate any specific vendor or brand, especially when eGovernment services or anything to do with public service provision us is involved.

 Prasanth, do you want to touch upon this, before we move on to the por tas of FOSS when spying is free and it comes with every service that you get?

 >> PRASANTH SUGATHAN: There is a definite financial benefit of moving towards free software. There are many instances, in terms of educational institution, in Government, where there is a different preference for proprietary software, and that even now the reasoning given of total cost of ownership, that we had filed -- IC FOSS.in filed a reply. Governments are still sticking to proprietary software and not adopted free software. In the 2012 IT policy, it States that Free and Open Source Software should be preferred and open standards should be the norm. But that is not happening in all the cases. In the example of laptops distributed by various state Governments, there were issues that preferred proprietary platforms in a few States. That's when you know that there is a cost benefit and other freedom benefits associated when going for free software.

 >> MISHI CHOUDHARY: Well, it is again freedom which is important. I want to talk about something very, very important and probably on a lot of people's minds, which is surveillance. Now that you get all these services, free Web hosting, some PHP, and your entire data is owned by so many other people, then what is the role of Free and Open Source Software in addressing the problem when NSA and various other Governments are watching everything that goes through the Net. We talked about access, how to get the next two billion online and what will happen. We have seen efforts like from Facebook, trying to sell their own things as open access, what kind of access are we trying to sell these people? What is the role of Free and Open Source Software in resisting the resistance by the most powerful Governments, Sunil, when they are the ones who are in the race to the bottom to get your data and surveil every minute.

 I'll start with Sunil and go in that direction.

 >> SUNIL ABRAHAM: So the standard response to how FOSS will help you prevent being surveilled upon is the earlier argument that I made. Which is given enough eyes, all bugs are shallow. Given enough eyes, all the Government back doors will be identified.

 But what we have realized, when we heard from Edward Snowden, that those missed encryption standards that depended on elliptical curves were compromised because the U.S. Government has more mathematicians on its payroll than anyone else, is that we cannot be sure. Increasingly Civil Society activists are getting cagey about trusted free software projects, like TOR and TAILS. Because they say why is one Department of the U.S. Government funding this? So if that is no longer the primary argument that you can make for free software then what is. Remember what Edward Snowden told us. He said that we most likely cannot stop surveillance but we can make it very expensive. So therefore the right to modify, one of the fundamental four freedoms comes super useful if there are a variety of free software distributions, free software products, et cetera.

 All complying with, as Ramki says, with open standards. Then the cost of being surveillance will increase dramatically. If there was only Android and 90 percent of the Indian market only used Android. Then compromising Android is cheaper. But if there were 50 prominent variations of Android, then the spyware that the evil Governments develop have to be tested on each one so that it works. So we have not stopped surveillance but we make it much more expensive and therefore reduce the amount of surveillance going on in the world.

 >> MISHI CHOUDHARY: Maybe the resistance, encrypt everything. Make their job tougher.

 I do think that DARPA is a major sponsor of technological research in both private and public domains. And the fact that something is available under a Free and Open Source Software license at least guarantees that you or somebody else can use it for whatever purpose you like, good or bad, it does not matter. And freedom to use it for any purpose is there. And that's the beauty of free software Prasanth.

 >> PRASANTH SUGATHAN: I feel the very fact that -- (Off microphone.) So of course it is -- it's not -- I mean, you can't say for sure that they would not be able to access your data, but definitely, the more people who start using encryption, who start using TOR and other services, it will make it that much more difficult for them. So if we start using encryption and services like TOR.

 So if you look at Indian scene, as for the latest DRA data, we have something like 238 million users of the Internet. Of this, 220 million use it through mobile devices. That's a huge proportion. And it is going to a real problem if all they get are like, as was pointed out, walled gardens. If all they get are services provided by Google and Facebook, then they are not getting the Internet as it is, they are only getting the walled gardens provided by Facebook and Google. And this is the problem. This is where the free software communities should come together to make sure that we have innovative services running -- like we have enough common structure available for social networking and emails, and make it not that easy for Governments to surveil us and more easy to use our products and privacy.

 >> MISHI CHOUDHARY: That's true. Because as transparency becomes hard to use free software for surveillance, because if people want to go take a look, they can. What do you think Free and Open Source Software is when it comes to this regime of spying that we live in. Spying, when every Government is spying on everybody. When there is mass surveillance which is arbitrary, but Free and Open Source Software have a role to play in there?

 >> S. RAMAKRISHNAN: Yes, of course. But it's not such a -- perhaps as straightforward. Because you are viewing from the purely client end of it. But you do not know if it's in the network of servers all over the place. It can be behind, we now use the word "Behind the Cloud." Behind the Cloud, you think what is being stored is in the Government system, they are all being done with all the safety precautions, even many of them through Free and Open Source Software are used in the servers, but we still don't know enough about it. So purely from a user point of view, yes, the bar gets raised so you are comfortable with it.

 But when it comes to applications like Facebook and things like that, I'm a conservative user. So I'm very safe on that. So if you ask me and others ask me, I also tell them be cautious.

 >> MISHI CHOUDHARY: Satish?

 >> SATISH BABU: Thank you, hello?

 (Off microphone.) (Off microphone.)

 The problem with the encryption is that (inaudible) what that means is that (inaudible) (Off microphone.)

 If more and more of the users use it, the chance of (inaudible) would be lowered. But

 (Sound not clear)

 -- using transport analysis tool. Now, the good news of course is that TOR has not been broken, this is the design parameters of TOR. It's meant to do certain things and not other things. And what the guys tried to do was just a set of certain things. TOR is not broken yet, but it can we broken on the feasibility of breaking it.

 So my own response is that we have to create new tools, with the existing tools, and free software does promote the ability to do that.

 But then, this is a very long journey. We are not going to be as someone already mentioned, it's going to be very difficult to resist 100 percent. But the actual difficulties that lots of people are asking, what about this encryption, what secrets do you have to hold aloof from the Government? After all, the Government should know generally everything because the Government is trying to protect all of us. This is a difficult Question to answer. But they don't realise that there are places and times in the world today when people can be killed for what they are transmitting. And these are regimes and there is a lot of turmoil and the Government is snooping on what you do. And in India, things are relatively peaceful so we don't have that kind of a situation. The key information providers, journalists, are being snooped on. And they can lose their lives in other parts of the world. So there is actually a very very significant cost.

 So the problem that I also see is that many of us, free software advocates tend to use the tools without knowing the flip side, without knowing that they can be broken. So we have to be wise about using some of these tools. So in summary, I would say that Free and Open Source Software has a great deal of role to play. In sharing that, in fact, this is the Sixth freedom of. The freedom of my own privacy and against surveillance. So in ensuring this freedom, free software has a major role and there is no other things that can help us in this type of thing. But it has to be used with the knowledge of what it does and what it doesn't do. Thank you.

 >> MISHI CHOUDHARY: Yes. Prasanth.

 >> PRASANTH SUGATHAN: The Government announced that when contact with 1.1 million dollars with backdoor attack.

 >> MISHI CHOUDHARY: Well, that is correct. What Sunil said earlier, whether it's the standard setting bodies, which have been infiltrated to such an extent because they are so avoiding those meetings, and not everybody sits to the end, and then the capture becomes easy. And everything nasty or center is usually hidden under a lot of verbiage and jargon. But still what we have heard is that there are tools which are already in existence, and there are a lot of Free and Open Source Software which make it possible for people to modify them to use and protect their own privacy. That is why we also see efforts and recognition from the FOSS projects about the importance of privacy, whether it is the public XMPP operators' commitment to encryption or a company which is successful based on a lot of open source but does not believe in free and open sourcewares, using a tool called end-to-end.

There is recognition and there is a big role for it.

 I do want to come back to one major Question and I think Ramki left. But I want to come back to all of us who are using and working in the field for a very long time. Why is it also esoteric? Why does it seem that people are not so concerned about the questions that seem so natural, like breathing to us? What is it about FOSS or the other technology that we are not able to get to, or maybe we have to some extent, to the public. What is the reason and what are the steps that we can take, everyone else can take, in order for the general public to understand the importance of Free and Open Source Software in all the fields that we touched? Sunil.

 >> SUNIL ABRAHAM: This is a complicated Question. Free software is, perhaps, esoteric because it's still, in Indian philosophy, can be compared to an unmarried youth. So in Indian philosophy, there are many stages of life and the two stages that I would reference here are Brama the State of being unmarried and youthful, and the next stage which is being married.

 So if, for example, you have a free software meeting at my office in Bangalore, you will get something like 20 men and one woman and all the 19 men or most of the 19 men will ask the single woman for her phone number and she will never come to the next free software meeting.

 So --

 >> MISHI CHOUDHARY: Okay. You can ask my phone number, I'll still keep coming.

 >> SUNIL ABRAHAM: So it's traditionally known as a very hostile moment to women, very poor gender representation in the software movement, even worse in the traditional IT industry. And movements which takes marital crisis so much that they lost their manners. So if you get on to mailing lists and other channels, unless the community has gone out of the way to make themselves friendly, it can be a hard community to penetrate and work with. So I'm hoping that the free software developers will fall in love, get married, and the movement will move to another stage where it will be much more welcoming and will allow a larger population to join the ranks.

 >> MISHI CHOUDHARY: Great. Ask Sunil to come up with analogies that none of us would think of. But there are efforts being made. There is a programme that I would recommend for all of you to check out, called outreach programme for women, which is being run by the Ganone foundation and there are other such efforts to have some gender balance.

 I want to say that one woman can kick 19 peoples. That's why she is enough. But I'll move on to Prasanth for his comments and then Doctor De and Satish.

 >> PRASANTH SUGATHAN: If somebody wants a mobile phone, they just want a phone that works. Only a few percent understand that under an  Android phone there is a Linux operating system. Ten years back it was like Linux was difficult to use, free software was difficult to use, but that's not the case now. But people are not worried about the freedoms that come along with it. So with that, a bit of teaching and people trying to understand the issues of surveillance and privacy, I mean, I think if people are willing to understand what are the problems with privacy and posting everything on Facebook, then people would be a bit more bothered about that. The same with free software. If you make people more aware of what are the issues of proprietary software, then definitely I think they will look at free software option and try to understand what exactly is free software and what are the freedoms, as such.

 >> MISHI CHOUDHARY: Professor De is online. He wants to comment on this.

 >> MISHI CHOUDHARY: One minute, Professor De. I see it's the Android phone. So you'll have to be a little patient.

 Sorry about that. I think now we can hear you.

 >> RAHUL DE: Hello. Yes, Prasanth, what was the Question?

 >> MISHI CHOUDHARY: Professor De, I had asked why frooe Free and Open Source Software seems esoteric right now. Why is the general public not so sensitive about the advantages which FOSS offers, despite its ubiquitous presence?

 >> RAHUL DE: Oops.

 Can you hear me?

 >> MISHI CHOUDHARY: Yes, we can.

 >> RAHUL DE: Mishi, I'm sorry. I don't know the Question. There is too much echo.

 >> MISHI CHOUDHARY: I'll let Satish respond and I'll just tell you what my Question is, so that you can answer it.

 >> SATISH BABU: Yes. (Off microphone.) It's a function of how well developed the society is.

 So in other words, this is a -- the value is basically depending on -- it's like Maslow's hierarchy of needs. So you value freedom when most of your other needs are met and you look at freedom as an essential. That's when society can really opt for free and open source software. If you look at India, you see a lot of variability in the ways that regions, different demographys, value free software. And my own experience from a place where there is a fair value being attributed to free software, it's not a technologically more robust solution, it's a good alternative.

 It's that it is because that -- because of the fact that that state where I come from is perhaps better developed. Now, this is not to say that we are really kind of apart from the developed world. There was an incident where two women were bashed up. Why? Because they wrote about a movie that was released, that the movie was lousy. And the fans association, the guys came and bashed them up. If you don't have the fundamental acceptance in society that women can make statements and they have the right to do that, then it doesn't follow that we can then utilize the freedom of these technologies. So in that sense we have a long way to go in most parts every India. And the much more fundamental issues have to be valued first before we come to free software itself.

 Having said that, I'm not bearish about free software's penetration, there is a lot of interest.

But this is only in certain areas that are more educated, that are willing to look at alternatives, et cetera.

 >> MISHI CHOUDHARY: Dr. De, is he there? I think you will be joining with -- we are already running over time, it's 3:10. I'll just have Dr. De to make a comment. We could not talk about software and the software product industry, but I'll have Dr. De comment. Yes, Dr. De, we can hear you now.

 >> RAHUL DE: Okay. I'll address that Question about awareness of free software. Let me mention, let me begin with an earlier Question, which is how you deal with awareness of information technology as such. I found that people working in large corporation, modern corporations, are also not aware of free software and its intricacies. So communicating free software is very hard. One has to begin at the stage of just talking about what software means, and why it's important for us, why ICT is important.

 Now, the good news is that because of of the proliferation of hardware and device with a large number of people having such things, the task of communicating what software does is somewhat easier, although still very hard.

 So that is the product within which I would answer this Question. Free software has many things going for it within schools, I know that I've been doing this, I've been with Satish for a while, in schools there are movements for free software in the curriculum. We looked at close to 7 States. And in all of them there has been a push back. People tried things, schools, many schools earnestly tried to work on free software, but, well, the very powerful proprietary software has won out in most cases.

 However, as a community we cannot give up. I believe the fight has to be at that level. In schools and colleges.

 Because of the nature of free software, that is where it's going to make the biggest difference and that is where we can hope to make this connection.

 There are other instances and isolated instances one can find where free software has made such a massive in rode that there are many people who are aware of it and that's spreading the word of mouth. There is no Government that backs it effectively other than the Governments like Venezuela or Turkey maybe certain parts of Latin America, Argentina in particular, where free software was actively promoted by the Government. In other cases it has not and that is the same for India. The software has not only to be provided for through legislation shall it also has to be actively communicated as to what its it value is. I hope our Governments will do that in the near future, but the community has to. And the some communities are very active and they are working on this.

 Thanks, I hope I addressed the Question.

 >> MISHI CHOUDHARY: Yes, you do. And we have run over time of the but thank you for this discussion. I hope that people will think about this issue and start asking the Question how to resist the resistance with the help of freedom, and which can help us remove all impediments all obstacles to the free flow of information, and protect us from whatever eyes are watching us.

 Thank you so much for this discussion. Thank you, Satish, thank you, Dr. De.

 There is no time of the people have to go for another session, because we started late. So I'm sorry there are no questions, but you can always reach out to people on the panel, Satish, frees check out, he is on Twitter, the organisation is called ICFOSS. Dr. De is active. Prasanth is at SFLC.in. So please fee free to chitchat and whatever questions you might have to make sense of it. I'm sure everybody is happy to engage and answer. Thank you everyone and thank you for attending.

 (Applause)

 (End of session)

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