INTERVIEW

THE O'REILLY MONOLOGUES

We invited TIM O'REILLY to talk to Linux Pro about Linux: instead he shared his thoughts on Linux, Open Source, the GPL, Microsoft, and more. By his own admission, "It's a lunchtime rant"...

TIM O'REILLY: To me, the biggest story with Linux – and the subject of the talks I have been giving over the last year – is the way that the Internet is changing the whole computing paradigm. A lot of the Linux advocates and a lot of the Free Software thinkers are backwards-facing! I have this trick question I use in my talks: "How many people in the audience use Linux?" – depending on the audience, it'll be 20 or 80 per cent. But when I ask, "How many of you use Google?" – every hand goes up. And my rejoinder is: "In that case, you all use Linux." We have this backwards-facing idea that what you use is limited to what sits on a desk in front of you, and that's just not true any more.

We're moving into a new era. There's a wonderful quote that I love from Dave Stutz (author of Rotor, the shared-source implementation of .NET). In his open letter, written on leaving Microsoft, he ends by saying, "software written above the level of a single device will command high margins for years to come - stop looking over your shoulder, and invent something!" His letter was all about how Microsoft is fixated on Open Source licenses, but that MS needs to get used to the fact that Open Source is commoditising a lot of the areas that used to be valuable in software. Meanwhile, there are vast new fortunes being created by people building on top of Linux – Amazon is built on Linux, Google is built on Linux, Yahoo is built on FreeBSD, www.SalesForce.com is built on Linux. What does that tell us? Why is the Linux market not owning its greatest successes?

Google: Linux's killer app If you talk to most Linux advocates, they'll say, "Isn't GNOME going to be great when it's as good as Windows?" To which I reply: "Why does that matter? It doesn't matter that much." The future is in software that is living on this new platform that we're building on the Internet, and an awful lot of that platform infrastructure is Linux already. I don't see a lot of focus in the Linux community saying, "Let's go do a story on how Google has the world's largest computer installation, all running Linux." Google has tens of thousands of Linux machines to facilitate its great application – the killer app of today's computing society. It puzzles me, and it frustrates me that the Linux community isn't saying, "Never mind Red Hat – look at our successes. Look at Google; look at Amazon."

Part of the problem is the political focus of a lot of people who speak for Linux. They go, "OK, these guys [Google, Amazon et al] aren't releasing their software as Open Source, therefore they're not part of our community." I would love to see the Linux community focus more on these killer apps. www.SalesForce.com is a good recent example. It isn't a Google or an Amazon, but it is about to go public with a billion-dollar IPO; yet why is no one trumpeting the fact that it's running on Linux?

In short, I think it's really important to recognise that people are building these next-generation applications on top of Linux, but they're not Open Source, they're not constrained by any licences because they're not distributed software. I'll come back to that thought in a

One day, will all businesses will be this aware of their place in the community and the consequent ethical, environmental and social responsibilities?

minute.

Software commoditisation The rules are changing. And if you look at a computer industry history, you can understand a bit about what the new rules are going to be. The last time this happened was with the personal computer. back in 1981, IBM changed the rules of the computer industry. Up to that time, all computer hardware was closed and proprietary. The PC was the first open hardware architecture. IBM thought it knew which particular rules were changing, but the rules then changed way more than IBM thought they would. IBM thought that what it was doing was, "OK, we're going to create this commodity personal computer, and it'll be sort of like VHS versus Betamax, and we'll own the market." But what IBM didn't realise was that first of all,

"IT'S REALLY IMPORTANT THAT PEOPLE ARE BUILDING THESE NEXT-GENERATION APPS ON TOP OF LINUX; BUT THEY'RE NOT OPEN SOURCE, THEY'RE NOT CONSTRAINED BY ANY LICENCES BECAUSE THEY'RE NOT DISTRIBUTED SOFTWARE."

everybody could make the same commodity hardware, and consequently the rest of the market would eventually be bigger than just Big Blue. IBM also turned over the software to Microsoft, because it didn't realise at the time that once you commoditise the

hardware, software becomes way more important.

I think one of the consequences of Linux and the Internet is that software is becoming commoditised – open standards lead to commodity software. Whether it's Open Source or closed-source, you can't necessarily make money in the same way. Taking Internet Explorer as an example – it's got to be free, because it's basically implementing an Open standard. If it's not free someone else will provide the same functionality for free. It's not really complex software – it's the system that's complex, and the system is Open. So what we have done is created a situation where the software is commodity software, just like how the PC was commodity hardware. So where does the value go?

The value goes up the stack to data. If you look at the big successes of the Internet era, they are companies who have built these data-rich services – eBay, Amazon, Google, and now www.SalesForce.com. All these companies are building this infrastructure on top of Linux – among other Open Source tools and languages – but neither they nor the typical Open Source advocate think of them as being a part of the Open Source community.

Giving back to the community Part of what I have been trying to do with these companies is educating them about their debt to the Open Source community, and trying to help them think through how to give something back so that they keep the virtuous circle going. When Jeff Bezos (founder and CEO of Amazon) did the One Click patent thing, I said to him, "Look, you got all this benefit from Open Source and Open standards, and now you're saying 'the party stops here'. Well, that's a bad idea for you, because eventually you won't have the kinds of innovations you've benefited from, and you're going to end up beholden to a commercial supplier – if you were running on Microsoft, they'd be squeezing you by the balls right now. Instead you have this Open platform, so keep that party going - figure out how to

Eric S Raymond: "know that the Nutshell Guides are but the outermost Portal of the True Enlightenment."

Apple's Steve Jobs: licensed the One Click patent from Amazon – something that O'Reilly has thought about doing too.

give back; figure out how to have some level of engagement."

I've been lobbying Amazon the most, because I know the people there pretty well, but it's not easy to figure out – even with a lot of goodwill. How does Amazon give back? Well, it uses Perl and Mason, and Amazon has started being an active contributor to the Mason community. That's a start, but Amazon is also very proprietary about its core competencies; even if it wasn't, Amazon isn't like a typical software project where you can just give away the code and you have it up and running. So now, Amazon has started thinking about issues like: "How do we open up?"

What that question led to was the Amazon web services API, which allows some reuse. You can create interesting new applications that reuse the API's functionality. No, it's not Open Source, but in a lot of ways, it's better than having the Amazon code – because if you had the Amazon code, you still wouldn't have Amazon. Pieces of it would be useful, but when a paradigm changes, the rules of business really do become different. So much of the Linux and FOSS advocacy communities are still playing by the PC industry rules, when really what we should be doing is building a new set of rules that is totally based around the next generation of software.

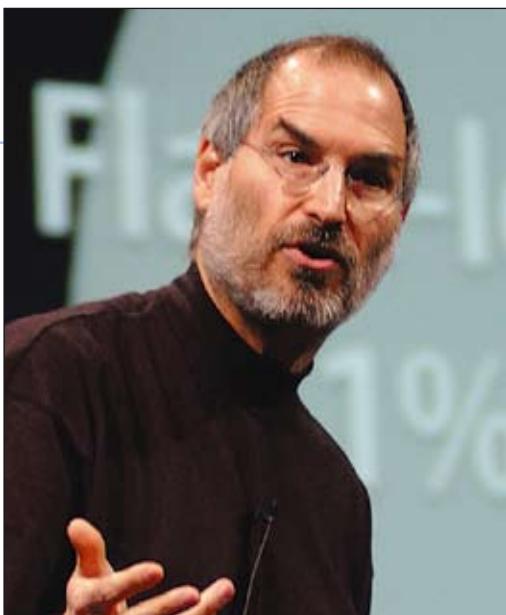**LXP: Has Amazon actually relinquished that patent?**
TO: No, it hasn't. Amazon did settle the case with Barnes & Noble, and I don't think it will actually use it offensively again. I think that's probably good enough... I mean, everyone's patenting; I don't think that's going to go away as long as we live, but the question is: do people actually sue other people over the patents they hold? I don't think they'll do that again.

LXP: Apple licensed it, didn't it?
TO: Yes, Apple did, and I think it should be licensed to more people. I've actually been tempted to do it myself, because I think it's a cool piece of technology.

Returning to the broader discussion, I'd like to think about how to take the ideals of Linux and the Internet – which are about collaboration, about openness, low barriers to entry, extensibility – and separate them from the original Open Source

Google founders Larry Page and Sergey Brin: probably the best-known Linux advocates in the world…

architectural design that just isn't present in a system like Microsoft Windows.

I had a similar conversation with someone at Apple about some of the things I wished that company would do. For instance, I love Rendezvous – a very cool Open Source technology that came out of Apple. But never mind the Open Source part – full advantage of Rendezvous isn't even being taken within the Apple applications – and that's just the tip of the iceberg. Apple has got some wonderful things in its various iLife applications: there are buddy lists in the Address Book, and also in iChat; and to return to the Rendezvous example, it was originally in some of the apps but not in others. Why doesn't Apple just let end-users get all this stuff across all the apps and make it consistent? They all have great functionality, and I'd love to be able to say, "these are the people on my buddy list with whom I want to be able to share my addresses"… The reason why this doesn't happen already is probably because the developers hadn't thought of it. Andy Hertzfeld, when he's playing with Chandler (a networked PIM) he's thinking that way. He's thinking, "Network!" How do you rethink these things in the age of the network? You think, "Oh yeah, of course I'm connected to these other people".

I'm totally rambling here, but when you look at all the social software stuff, you know – like Friendster or Orkut. They are all hacks to get around the fact that we can't share our addresses very easily. Apple says: "We didn't architect the applications that way," and: "We have to totally refactor these applications to make them into services that can be used by other apps". That's what I mean by an architecture that supports re-use.

Licensing and Unix heritage Linux has that Unix heritage where everything is designed to be a service to something else, and I don't think that people give that enough credit in understanding what's important about

definition, which is so heavily licence-focused. If you look at the values in Open Source, there are four or five different sliders, and you can move them differently.

A good example there is the company that Brian Behlendorf and I started called CollabNet, which your readers may know about. CollabNet started out doing Open Source projects, and it still provides infrastructure for OpenOffice.org and a bunch of other Open Source projects, but its biggest customer is HP, who use all the same technologies that OpenOffice.org uses (and Apache uses), but HP uses it inside its printer division – there's 3000 HP engineers collaborating inside the firewall. Completely independent of the licence axis, they are using the collaborative tools of the Open Source community.

LXP: Is that a bad thing?
TO: I don't think so – I think it's good because it's one of the real benefits. You can separate the idea of what licence do you release software under from how you develop it.

Looking at that axis of collaboration rather than licensing is one of the things I'd like to get people to think about. And it's more than just collaborative development tools and processes: look at the whole architectural aspect of Open Source – you design a system in such a way that it is easy for people to work independently. I originally got that idea from a conversation that one of our editors had with Linus Torvalds back when we were putting together the book Open Sources. Linus said something along the lines of, "I couldn't have done what I did even if I had the Windows source code because Windows isn't architected in such a way that I could have taken off a piece and worked on it." When you think about it, Unix has this 'small pieces, loosely joined' architecture, which meant that you could bite off a piece that's the size of a small team and replace it, while someone else could work on something else completely different. And that's a whole

"IF YOU WERE RUNNING ON MICROSOFT, THEY'D BE SQUEEZING YOU BY THE BALLS… FIGURE OUT HOW TO GIVE BACK… TO OPEN SOURCE."

Open Source. That's way more important than licensing. For instance Unix, under the old AT&T licence, had a community that looked like Open Source, until AT&T did something stupid, which was to shut it down. So to me, licensing is just housekeeping you do after the fact to say, "Don't be stupid!" I actually believe, long term, that none of the Open Source licences matter that much, because what will happen is that people will realise that all these things that the licences try to enforce are really good practice.

We won't need the licences because companies will realise that that's the right thing – the smart thing – to do. As we move from the religion of Linux to the science of Linux, we'll get to a point where

everybody says, "Oh...". If you're a pragmatist like me, you'll see that sometimes people do in fact sometimes try to keep things proprietary, one way or the other. Contrary to the point of view held by Richard Stallman, I don't believe that everything needs to be Open, that everything needs to be Free.

I'm looking to maximise value, and I see that everyone from Red Hat and CollabNet, to people like Google and Amazon, is making choices about where it's going to be open and where they are going to keep things to themselves. I make those choices myself – sometimes we make books free, or we make parts of books free, but if we made other things free we'd be a smaller business – or we might even be out of business, and then the value that we are able to create wouldn't be happening.
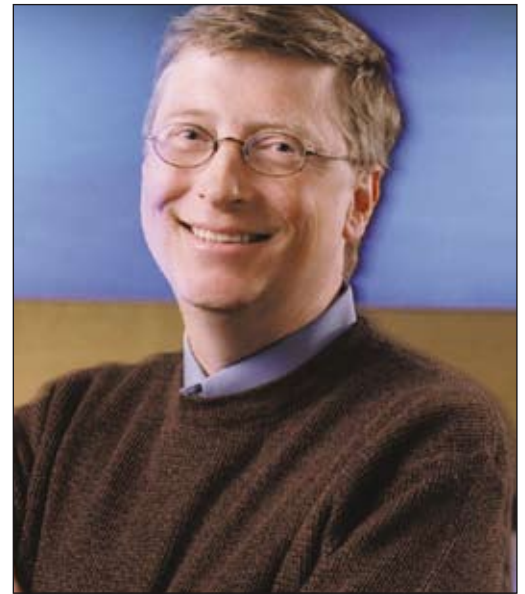
Maximising value Larry Wall has this great quote that's relevant here: "Information doesn't want to be free; information wants to be valuable." And for me, the real question is, "How do you maximise value?" I believe that one valuable thing Open Source teaches us is that people were not maximising value in a whole bunch of ways. Companies would create something useful that didn't succeed in the marketplace, and they'd lock it away somewhere, kind of like the end of The Raiders of the Lost Ark – in the big storage vault where no one will ever see it again. That's not maximising value – giving it away is maximising value because some dividend always comes back to you.

Larry Wall creates Perl, or Linus creates the kernel. If he goes off and tries to start a company, it's going to divert his energy: he's probably not going to succeed at raising money, he's not going to get to do what he does, so instead he maximises value by saying, "Hey, I've got something useful and I'm giving it to you, if you do something useful, give it back." We have this wonderful gift culture that grew up, and it works, right? But it's just one thing that works.

We also know that Bill Gates is creating a lot of value. Anyone in the Linux community who denies that is stupid, to be quite honest. I mean, Bill Gates has created huge monetary value for his shareholders, and he has created huge value for himself.

He also created the ecosystem that Linux depends on; I don't think Linux would be possible without Microsoft, because Intel and

The Internet wouldn't be the way it is today without significant input from Microsoft. Many Open Source advocates would treat this as heresy, but anti-MS feeling in the Linux community detracts from real issues in other areas.

Microsoft Bob: Probably not the future of graphical interfaces. As a forerunner to Windows 95, this result of millions of dollars of research only lasted a year… a whole 365 days too long, in many users' opinions.

Microsoft created the monoculture of machines that were all kind of saying, "Hey, we have this commodity hardware out there, let's now put some commodity software on it". It's a natural evolution. What Bill Gates did wrong was that when he started out, he benefited directly from the free-flowing hacker culture of the time, but as Microsoft became ever more and more powerful, he systematically shut everyone else down, and stopped the party. So again we see licences as a defensive move against stupidity.

IP lockup stifles innovation What I think will eventually happen is that people will realise, "Oh, the industry has more innovation when you keep a certain amount of fluidity." What happens is that when people lock up too much intellectual property – whether it's through patents or through copyright or through secret APIs or whatever method it is – you stop innovation, and the industry becomes stagnant. The best example of that is Microsoft. Microsoft has probably made more money from Open Source than any other organisation on the planet. But again, no one's telling that story. Why not? Because we define "Open Source" too narrowly.

But I look at the situation and say, "Here's Microsoft, and it was totally stagnant. They were working in the labs, and what did they come up with? Microsoft Bob." That was the next generation of computing. That was what we were all told: we've figured out what's going to come and be the next thing that will make you excited. And everybody replied: "You've got to be kidding". And all we've got left now is that nasty little talking paperclip, right? What really saved their ass was Tim Berners-Lee putting some software out into the public domain back in 1992; they looked at that, and TCP/IP, which came out of DARPA and UC Berkeley, and all the free software that was happening there, and thought, "Oh, cool, the Internet!"

So Windows 95 was a direct result of Microsoft being able to capitalise on all the benefits of a huge swathe of technological stuff that had happened outside its hegemony in the Open Source community. In the end, what frustrates me so much about the Open Source

community – as it stands at present – is that it's so focused on Linux. The Free Software movement in particular is so focused on replacing Microsoft as the challenge, yet they sound very surprised when I go, "My God, the Internet! The Internet! It's something we all built together. It is the greatest triumph: it's ubiquitous, it's the killer app, it was built by an Open Source community."

Sure, there was some government funding, but we all helped put it together, and the killer app – the world wide web – was actually put in the public domain: you can't be more open than that.
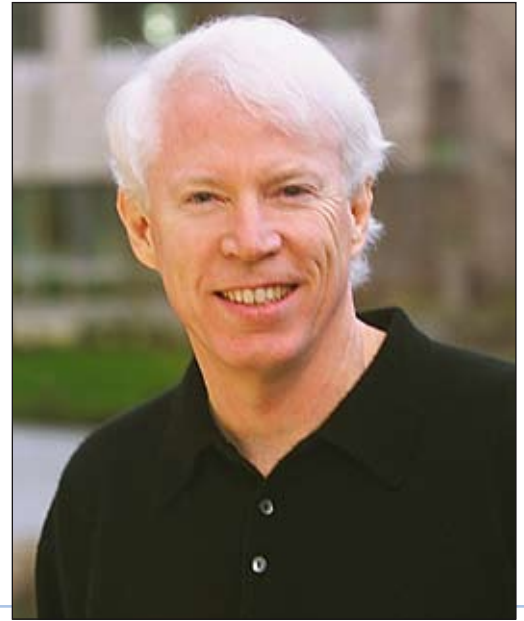
More Open Source innovation And again, why isn't the Open Source community saying, "Hey, HTML - what a great success for us." How about JavaScript as well? They're just off the radar, because they don't have the political element: and that's stupid. We're not owning the fact that we created the revolution that dominates the industry: in marketing terms, we're basically still chasing Microsoft's tail lights; when in a technical sense Microsoft just implemented our stuff after chasing our tail lights – only we seem to be too shy to position it that way.

Look at Apache. Microsoft has spent ten years trying to beat Apache and it hasn't done it yet (judging by the market-share of Netcraft), and Apache just keeps climbing. I feel like that's a real success story there, like the Internet. The fact is that Microsoft built Windows 95 and Windows 98… all those generations of technology since Windows 95 were all an incorporation of stuff that came from outside Microsoft. That's a huge part of the innovation. Now with .NET, MS is saying, "Now we're going to try to do to that platform what we did with Windows - we're going to try to control it, close it down." Fortunately, the public – particularly the developer public – is hip to that. For example, when Microsoft came out with Passport, and said, "Wouldn't it be nice, we'll do it all," potential customers thought: "We've seen that movie, we didn't like the ending last time, so we're not going to watch the sequel." I think that's a very interesting piece of the story.

Preserving the culture I'm not saying Linux is unimportant – Linux is hugely important, as it's a big piece of the platform – but it's only a piece. A lot of people think they see, "Here's Windows, and Linux is playing catch-up". What I see is that there's a new platform: the Internet. Microsoft is trying to take that over, and we need to say, "We're already up here, guys!" How do we make sure that what we built stays ours – that they don't take it over? As opposed to thinking that the game is to get to parity with them, they are trying to get to parity with us, we're just not owning our successes.

Meanwhile, there's a new set of application providers building on top of what we have collectively built, and we're not spending enough time making them say, "OK, this is our community - these are the rules we need to learn to play by." A lot of these next generation companies are going to say, "I want to be like Microsoft", whereas I want them to say, "Hey, I want to keep that

Jim Allchin, Group Vice President, Platforms Group, Microsoft – and visionary of a networked future.

culture that we came from." So it's real important to get people like Larry Page, Sergey Brin, and Jeff Bezos to say "Yeah, those are my forefathers - they taught me something, and I want to keep that in my DNA, because that's going to be good for me. Because if I don't do that what's going to happen to me is I'm going to close everything down and ten years from now someone's going to come along and do to me what we're doing to Microsoft." Anyway... I guess that's a very different perspective to what you'll usually get on Linux.

LXP: Earlier, you mentioned that you thought that licences weren't that important – they were just housekeeping. Does that mean you're not too worried about the recent announcements of problems between the Apache licence and the GPL, and also the X11 licence and the GPL?
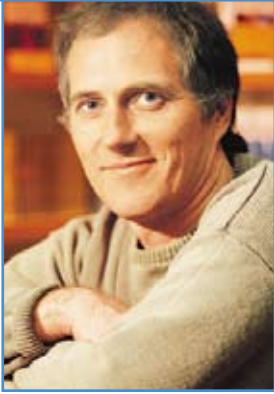TO: I haven't really spent a lot of time thinking about it, because I really think that licences aren't even a necessary evil; I feel that the whole Open Source community is making trouble for itself spending time trying to control too much. At the end of the day, Richard Stallman has just as much desire for control as Bill Gates does, and I don't identify with either of those extremes. I want to find that middle ground where we're focused on creating value, not managing to control what other people do – I don't care what other people do, as long as they don't try to control what I do. I want to see people stop writing licences that try to control what other people do. There may be specific reasons why people say, "Hey, I've really got to write this licence this way," but I think it's just a massive diversion of energy.

If I was Microsoft, I would just be so happy to see the way that people are focusing on licences – that's where MS keeps focusing everyone else's energy. But meanwhile, I meet with Jim Allchin (Group Vice President of Platforms Group at Microsoft) and he's totally onboard with this vision of a networked future, and that that's what MS wants to own. He literally said to me, "It's just like GUI – nobody owns it." And I thought, "What do you mean, nobody owns GUI?",

but that was the vision they started from: there was this new platform – the Graphical User Interface – and nobody owned it. And now there's this new network thing, and nobody owns it – and they want to own it! And that's the fight for the future. Again, I feel like our fight should be to make sure that nobody owns that, and that we keep the culture where it remains in commons. That's way more important.

A question of philosophy I personally am a very strong

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"EDUCATE COMPANIES ABOUT THE VALUE OF HACKER CULTURE – IT'S ABOUT PUSHING THE ENVELOPE, IT'S THE FRONTIER WHERE NEW IDEAS COME FROM…"

TIM O'REILLY

Apache/BSD licence fan. People should be able to use whatever licence they want – if people feel strongly about it, they can put the software under the GPL, but I think it creates some huge problems even as it tries to solve others. To me what's important about Open Source is that we lower the barriers for people to innovate, to try things, and the GPL is so focused on being a defensive licence to make sure that people don't do something.

I want to see licences that encourage people to do things. I can still remember my conversation with Bob Scheifler of X, from back when we were doing our X books and we were enhancing the MIT documentation,

Dave Stutz, Author of Microsoft's Shared Source .NET platform, Rotor; now full-time vintner.

and that it was becoming free.

We got some flak about that, and I went and talked to Bob. I said, "Hey, this is his software, his vision – how does he feel about it?" That's what I've always tried to base my philosophy on: respect for the wishes of the creator of the material I want to re-use. Bob said, "No, that's what I want. We're just trying to create stuff that people will take and run with, and they'll build on top of it." I love that philosophy: when you're giving a gift to the world and saying, "If you want to commercialise it, great; if you want to keep it free, great – it's your choice." Nothing is taken away if somebody does a proprietary fork – either it works and people say, "Hey, that's good enough!" and I don't care because they are good stewards of the software; or it just doesn't work.

And with Apache, what we've seen is that everybody who has tried to do a proprietary fork has failed; so, those licences I criticised earlier actually work reasonably well, and there's far less bullshit about "You didn't quite do this, and you didn't quite do that." When I look at the GPL, I see it as an obstacle to my goals. I'd rather see people spending less time fussing about "Is it compatible?" or "Can we re-use it?", and say "Yeah, you can do whatever you want." To me, again, this has to do… well, there's this wonderful line from Tao Teh Ching, by the Chinese philosopher Lao Tze. He said: "Losing the way of life, men rely on goodness; losing goodness, they rely on laws."

Why licenses? Licences are laws. Let's try to encourage people to do the right thing, as that's better. But even better than that is learning the way of life, which I think is just the science of it, understanding that openness works. And we can trust that openness works, because it really does. And what we have to do is teach people what works, and what I see working is people saying, "Hey, I need to be open because it has these benefits, and over here I need to be closed because it has these benefits, and basically finding an appropriate balance."

On the other side, to the folks who fear that Open Source is an 'intellectual property destroyer', I like to point out that there are lots of opportunities for proprietary advantage – even in the most open systems. Let me give you a couple of examples. Take the open architecture of the IBM PC that I touched on earlier, which launched the commodity hardware revolution. I just point to the label on most PCs: 'Intel Inside'. Here's this Open architecture of IBM PC, but somebody managed to create a proprietary spot in there – there are probably a bunch, but that's the best known. Now that we have the Open Internet, it could be branded 'Cisco Inside'. When we move up to the software stack ,there will be plenty of proprietary pieces hidden in plain sight. There's some right now, even in the Open Source Internet.

The business model for BIND was domain name registration, we just didn't realise it at the time and so it became separated and it's now a monopoly. That is basically worth hundreds of millions of dollars a year; it's a valuable property. There will be those kinds of things. If we think ahead we can anticipate and make sure they

don't go to the wrong people. It would be nice if Paul Vixie (Author of several RFCs and well-known Unix system programs, among them SENDS, proxynet, rtty and Vixie cron; and founder of the Internet Software Consortium, which in 2004 was renamed Internet Systems Consortium) was making some of that money, and if it were a bit more competitive and a bit more open. But also, I think innovation has stopped in many of the consumer-facing applications; however, there's a lot of innovation going into building out this next generation infrastructure for computing. I think that what we're going to see is that we now have these new consumer-facing applications – the Amazons, the eBays, the Googles – whatever it is that fills the application layer: and we're going to start weaving together an Internet operating system. And there are going to be a lot of pieces inside of that, owned by people like BEA (www.bea.com). People are going to figure out the hard parts of that problem, and eventually we're going to have utility grid computing, and there are going to be people who figured out the hard parts of that problem – I know of start-ups that are working on it right now.

Those guys are going to have deep intellectual property, as they are doing a lot of innovation and are going to end up controlling big pieces of the future. And one of them is eventually going to emerge and be the next Microsoft. Who knows? It could be anyone. But there are people who are building the insides of that global machine that we're now seeing the first prototype of in today's Internet.
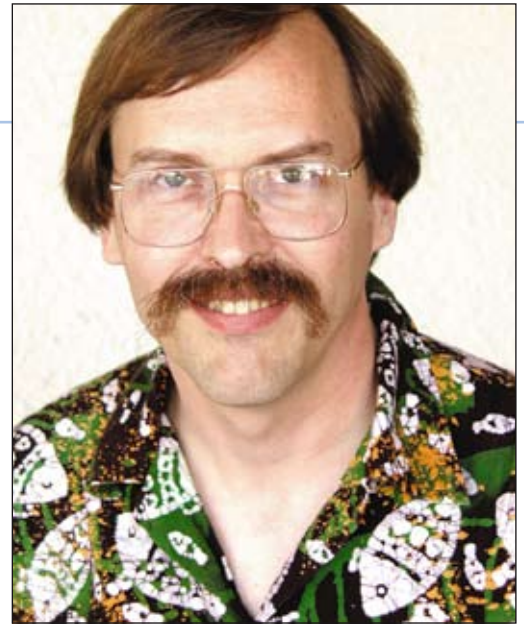
LXP: Isn't the counter-argument that one of the biggest benefactors of Open Source software, through the BSD licence, is Microsoft?
TO: So?

LXP: As you mentioned earlier, MS has created systems that are closed out of systems that were previously open and available to everyone.
TO: My reply to that is, "Yes, if you're Richard Stallman then absolutely that is a bad thing, because his goal is the creation of free software." He doesn't care whether that's better software – he has actually said, "That's not what I'm about." He's not about creating better software, he's not about creating more functionality for users – he's about

Larry Wall: "Information doesn't want to be free; information wants to be valuable."

creating Free software, which is a moral, ideological point of view. If Microsoft hadn't been able to take all that BSD-licensed code, the TCP/IP stuff, and we weren't able to have Microsoft helping to drive the commercial adoption of the Internet, we'd still be sitting here, like we were ten years back, with a bunch of geeks who have this wonderful Internet functionality but the average user probably would not have it.

And yeah, maybe we'd still have our party, and maybe we would have marginally more success, but there would be hundreds of millions of people worldwide who wouldn't have those benefits. Take a look at some of the hacks that are being done. Here's one I picked up off Slashdot that I love: there's a wireless 'pony express' happening in Cambodia, where some guys have set up five motorcycles equipped with wireless, and they drive this route through rural Cambodia, and once a day email gets picked up. And there's a base station back at a school where they connect back up to the regular Internet – what a wonderful hack!

The hacker impulse – the freedom we really care about – will happen even on Windows. We just need to inject more freedom; we don't need total freedom. I look at that and think, "OK, so here are people in rural Cambodia who are able to the benefits (or, in some cases, they are probably getting spam – the drawbacks) of the Internet. And this thing that was created was partially done because, yeah, Microsoft got a lot of stuff out of the Open Source community, and they took it in, and what did we lose? We didn't lose any freedom. Yeah, some other people got proprietary software instead of nothing." The whole of the Internet was undeniably driven by commercial adoption by people like Microsoft. It would still be a geek thing if it weren't part of Windows. We'd still be a very distinct minority; there'd be 10 million people using the Internet, instead of hundreds of millions.

LXP: There are quite a few people in the Open Source community who couldn't see that as a disadvantage!
TO: No, but if you're looking at the creation of value – I see this as the natural evolution. The hackers are always going to move on. What I think really matters to the computer industry is that we need to educate companies – including Microsoft – about the value of hacker culture. Hacker culture is about pushing the envelope, about pushing the boundaries. Open Source is a facilitator for hacker culture, and openness of various types is a facilitator for hacker culture. And it's the frontier where new ideas come from, and we need to go for that frontier. ■■■

Andy Hertzfeld ex-Apple full-timer, now at the helm of Chandler development.