

BRIAN BEHLENDORF

Graham Morrison geeks out about synthesizers with a kindred spirit, then remembers to ask some questions about free software.

What do the *Apache* web server, the EFF, Mozilla, the World Economic Forum and Obama's 2008 campaign have in common? The answer is Brian Behlendorf. He is one of the founding developers of **httpd**. He was the co-

founder of Collabnet, the company responsible for *Subversion*. He's been on the board at the Mozilla Foundation for over a decade, and joined the board at the Electronic Freedom Foundation in February 2013. He was a technology advisor to the 2008 Obama campaign,

and helped the Department of Health and Human Services develop open source solutions for electronic health records. He's served as CTO to the World Economic Forum, he's an entrepreneur, a fan of electronic music, and a true open source polymath.

LV **Larry Page said Google could save a 100,000 lives with access to big data, but is Google the right company to do this data mining? Can you see a way of doing this that respects people privacy, while still saving 100,000 lives?**

Brian Behlendorf: I think what disturbs people is not the sense of data being shared, but data being shared in ways they either can't quantify or can't control. And control of data is an awkward thing, because there's no physical law that allows me to take away something you know about me, nor should there be. Because you have as much right to data you've collected about me in a mutual transaction. When it comes your rights to sharing that data with others, that's where I think we can talk about appropriate rules or not. And so finding ways to actually get their consent, to share that kind of data or make people active participants in understanding where they can feed that...

LV **It's trust, isn't it?**

BB: It is, certainly. There's a project out there called the Respect Network, which is a coalition of a bunch of different companies (I think Swisscom is a part of this and a whole bunch of startups), to basically put

together a contractual network for sharing data that binds the participants into covenants with the end user. When you give data to a member of the Respect Network, you can grant them the right to share that with other groups that you talk to also within that network, but you also have the ability to ask them to remove that data, or to update it and have that update shared once with the rest of the members. So it's a way of starting to claw back a little bit on the consumer side, an understanding of how that data propagates. And then you can't share it outside of the Respect Network, right. That contractual relationship stops someone from being able to do things nefariously with your data, like share your credit card information with your health insurance provider so they know about all those trips to McDonalds.

LV **<laughter/>**

BB: That actually happens! It's not a hypothetical thing.

LV **Maybe we're too cynical, but that's the kind of thing we worry about. Even in anonymised data, there's still a shadow of yourself, and of the population.**

BB: De-anonymisation is getting better and better all the time.

LV **But where does the trust come into de-anonymisation?**

BB: We shouldn't pretend that you can take data about somebody's very intimate details, like places they've been, especially transit data. There's a study that showed you can uniquely identify individuals by having just four data points of their daily route.

LV **Wow.**

BB: When you think about it, the places that you work and the place that you live, how many other people take the same route to work within a couple of hundred feet to a couple of hundred feet? It's probably a very small number. If you gave me, here's anonymised transit data showing every trip inside London, I'd probably be able to go from here and here, who are the two people that live here, and then with one or two more points, discretely just get it down. So that's scary, right?

LV **We're right to be worried about it being in the wrong hands.**

BB: We're right to be cynical or question anyone who says "don't worry, we anonymise it first before we hand it on". At the same time, I do absolutely agree that better data informatics can lead to better health outcomes. But I think that only works if you've got the active





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participation of the end users and they understand what they’re doing. I think this is what drove a lot of people nuclear with the Facebook timeline thing, is the sense that there was no consent around that, no awareness of it. Even if we know that our timeline gets played with, OK I can understand being played with to click on an ad, I’d be more likely to click on something, but played with to be more depressed or happier about the world around me, that’s pretty F’d up.

LV Or sicker or healthier...

BB: Right. So I think we have a few more iterations of this where we are going to discover I think what ways to quantify that deeper need we have.

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When we see that a friend told us about a disease they had, if you search on Google and suddenly you’re seeing ads for creams and lotions on other websites. Maybe it doesn’t happen with Google, maybe it’s other places, they’re kind of re-targeting in that kind of data utopia. What could happen with that?

I think that’s going to drive a demand for different technologies. In the same way that Apple stepped in at two different times, once in the 80s and once 10 years ago, and said there’s a need for better design when it comes to how we use computers, I think there’s an opportunity for another company to step in and say we’re going to provide technology that addresses this gap, this thing that’s in the zeitgeist that the existing leaders are saying no-one cares about, which is the desired form of trustworthy technology.

LV Surely the most important thing is implementing the system that could save 100,000

people’s lives and we could do that right now?

BB: I think we’re going to find upper limits to what it means to be human. We could get so precise with the data that we could tell you that for every Oreo that you eat, statistically speaking, that’s six minutes off your life. You could even come up with a wristband that would monitor everything you do and go ‘You’re going to walk out in this sun? Well that increases your risk of getting skin cancer and that’s another 10 minutes off your life’.

And pretty soon, if you have that perfect picture, insurance is no longer about creating a pool of roughly equal people to help balance out the extremes, instead it becomes about prepaying for medical expenses. And that’s the danger here, is that it’s not necessarily in the individual’s interest to preserve their life at all costs.

LV As a society, we can’t afford to go down that route.

BB: There's so much more basic information needed that it's almost not even worth thinking about right now. Like, the challenges people have just getting their medical histories transported from one place to another to another, especially people with chronic issues [such as] diabetes. I mean imagine, it would be so much better if you could create consistent, high-quality, longitudinal data pictures.

LV Google's got the data.

BB: Once they have those contact lenses, they may have perfect data. But I think we should help individuals with managing their health stream information, and through that, helping everything else. When I was at the Department of Health and Human Services, there was this recurring theme, which not everyone was a fan of, but it was individuals at the centre of their health information exchange, and there had been very few attempts at doing a really good personal health record system. [Microsoft's] HealthVault has probably been the best funded of them, Google gave up on it with Google Health; now it looks like they might get back into it, them and Apple, with this health metrics thing. But I think those will eventually come back around to helping the people who are trying to maintain their health, a mix of the exercise, doctors' reports and labs and that sort of thing.

LV Can you tell us about your role on the board of the EFF, Mozilla and Benetech?

BB: Sure. They're three non-profits that are pretty different in terms of how they go about implementing change in the world. It's largely about oversight, direction-setting and trying to bring in other individuals with interesting viewpoints. But trying to understand what's at the core of these three – as well as making sure that we tackle issues like a CEO not working out or should we shift the mission to tackle that – that's what we do.

The EFF's background is as an activist organisation. They just did a major release of something called Privacy Badger, which is for blocking cookies and things like that. It has seen a major expansion in the public attention being focused on the EFF because of the Snowden leaks. And there's recognition that things feel broken in a space at a much deeper level than just policy. That it's something about how we relate to governments and other organisations with the privacy of our data and the systems that we use. Part of the feeling is in tools, but part of it might also be in the way we relate to these organisations and the liberties we've allowed organisations like the NSA to take. And so in addition to writing software, we sue the government. We rally public attention around certain key

issues, we try to shift legislation here and there, and make people understand when there's a vote going up on an issue they care about. A lot of it though is also education, helping people understand what these issues are, or helping train journalists and people fighting for different particular points of view in different countries. Like, explaining to them what the laws are in these areas or what are the tools you can use to communicate securely as well. So it's a pretty diverse organisation, the EFF.

Mozilla is very different. Mozilla's

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main thrust is the fight for the open web, and they do it by building consumer products that people love. And we've had challenges as you would expect any 14–15 year-old-organisation to have. The organisation is about 11 years old, but the project started even four years before that in '98 as the open sourcing of the *Netscape* browser. There's now about 750 people working for Mozilla. We have one major revenue stream, and we're looking for others.

LV By 'one major revenue stream', do you mean Google?



Brian Behlendorf is potential father of the term 'Intelligent Dance Music' as he ran the famous early 90s mailing list.

BB: Well it's not even that it's just one vendor, it's that we're dependent on one particular way of doing things. I have to be clear here, I'm on the board of the foundation, the foundation owns the corporation, the corporation is the one that builds the products and gets them out. The foundation licenses the trademark to the corporation, so it brings some money in that way, and we have some other investments and things. So the foundation does a lot of public benefit kinds of projects; the Webmaker project, Popcorn, that sort of thing, and fund a lot of open web, education projects. The corporation is the one that builds the product and we have to maintain this distinction because the [tax authorities in the USA] look very differently at non-profits and for-profits. So I can't tell the corporation what to build, but we can talk about this fight for the open web. It used to mean fighting for HTML 5, JavaScript and CSS, and we won that war. We were not only a faster browser, we've shown the world that these technologies are a better way to build web apps and websites, and why building a site for one browser or the other is lame.

And then the world took a tremendous step backwards and got app crazy. We as technologists out there wondered why would you want to build platform-specific apps when you have the web, and what we kind of got schooled on by Apple and others was this idea of local applications that could deal with local data that could deal in disconnected environments, that one could procure in an app store and pay real money for, generating a revenue stream for people, was interesting.

 **Apple stumbled on that idea though. Their original idea on the iPhone was to have web apps.**

BB: It's funny how, for many of us, our biggest money makers come from happy accidents. But they took a step back, and now we do have platforms like Apache Cordova, which allow for some degree of portable development. But I think what really became clear, even five years ago, was the sense that the fight for the open web was no longer about a browser and about the presentation language, it was also about payments and also about where you store your metadata.



These are all things that are becoming core parts of the operating system. So the web standards needed to be updated to be able to do things like trigger the camera on your device to take a photo, which wasn't in HTML before, so rightfully that's one thing that apps had on us, so we had to come up with standards for that. But then we needed to look at not just getting Firefox to run on Android or getting it to run on iPhone, which Apple wouldn't let us do because it's a closed platform.

 **It's a great app on Android.**

BB: So on Android we're able to do it, but even there it's not enough. Even there it's clear that we need to be so much more deeply integrated with the rest of what people expect from their phones. So that was the genesis of boot to Gecko and now Firefox OS. (Firefox OS phones are now available for sale in 15 different countries, by the way). The majority of R&D software development effort at the corporation is now focused on Firefox OS and making that work, on mobile in general I'd say, but Firefox OS is a huge part of that. It's a huge deal for us and I think it's not just phones, it'll be tablets and other things you'll see.

But thinking about fighting for the open web, it's funny how the Snowden stuff comes up again. It's almost like the battleground has shifted to talking about helping people and how their communications can be secured, and not entrenched with any one vendor.

 **And you could argue that's something you've done your whole career.**

BB: It's a fight that I've helped with at different times and I'm still very happy to be working on that at Mozilla. And at Mithril too, hopefully. I mean, if a company comes along that is able to be an interesting part of this fight, that'd be a huge thing. The opportunity here is really big for companies, and let me be plural about that, to step in and look at providing an extra layer of security or an extra guarantee, or maybe even capturing this moment in the zeitgeist, where there is an unfulfilled demand by consumers, sometimes even not expressed directly by consumers, to understand how to trust technology. Even enterprises have this challenge too. So I'm constantly out there looking for folks doing interesting things here who we could help put thruster rockets on and go to orbit with. 