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I Believe in Network Clients

By Jonathan Schwartz

At an interview recently with John Markoff of The New York Times, I made a statement that seems to have generated some concern over my sanity. I said, “I don’t believe in thin clients.”

Let me start by saying I started my technology career with a company that built client (i.e., desktop) software. I care a lot about user experience. And for that reason, I’ve always thought the words thin client were oxymoronic. No two words have ever been less comfortable sitting next to one another — one cannot have a client without at least some functionality or “state” on a device, and the girth of that state (as measured by memory or storage or application footprint) directly correlates to the interactivity of the client.

In simple terms, TVs got more interesting when they sprouted set top boxes. Radio got more interesting when iPods came along. And cell phones blossomed when you could download games and ringtones to their resident Java platforms.

Industry convention says that applications written to browsers are defined to be “thin.” But by that definition, thin really equates to “using someone else’s runtime environment” — in that the browser itself has to be present for the service to be rendered. And last I checked, browsers require operating systems and windowing environments. Not exactly thin. So in my book, it’s inaccurate to say Google or YouTube are “thin clients” — they’re services that leverage someone else’s thick client. A browser.

With this heresy behind me, I’m also (less controversially) of the belief that the most interesting consumer innovations are those we experience with our eyes — through compelling clients. And until recently, very few companies were investing in client software or hardware — sure, there were lots of browser applications, but that’s what they were.

But that’s changing. Innovation on clients is back — we see it in a flurry of Web 2.0 companies investing in creative desktop interaction and the resurgence of JavaScript, in the myriad toolbars the big portals are driving into the world, and more interestingly, in an ever broadening array of new devices showing up in the hands of teenagers, on automobile dashboards, in our living rooms, basically everywhere. None of these are thin — at least in my definition. They all, however, leverage the network. And that’s the big innovation — it’s no longer just a browser presenting the network to users. Its standalone client applications and devices.

But why the renewed energy around clients? This was venture capital no man’s land a few years back, but no more.

First, the strategic reason — relying on someone else’s browser is a precarious choice. Especially when the distributor of the browser can use it to compete against you (type “news” into Microsoft Vista’s browser, and you don’t go to news.com, you go to MSN News...). That’s driving a lot of companies to validate their services against Firefox, Opera and the Java platform — and as interestingly, it’s driving companies to rewrite their applications to be standalone network clients, like iTunes, or the NetBeans developer tool. Standalone network clients, hardware or software, avoid the threat of disintermediation from unfriendly runtime environments.

Secondly, users don’t like to wait. Which from my pedestrian vantage point is the fundamental motivation behind “Web 2.0” — resident functionality, whether Google Earth or NASCAR’s PitCommand, is more satisfying than visiting a Web site that tries to load great heaping volumes of JavaScript into a browser every time a user appears (or more



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frustratingly, reappears). Patience isn't a virtue when it comes to computing — out of site, out of mind (pun intended). Make the user wait, they'll go elsewhere. However, if you provide a persistent executable, one that lingers between usage — or attaches to your belt loop — you're more likely to keep the customer.

Lastly, the network has finally become pervasive. You can get a signal nearly (I did say nearly) everywhere — but as we move from a world of relatively reliable landline networks, to one in which we share services with mobile and wireless networks, the latter's spottier reliability is becoming more pervasive. And for a network service to retain its utility, it's got to do more than fail to appear when invoked off the net. Which implies an interactive client that persists, or hangs around, even when the network disappears for a moment. That's why your in-car navigation system works, even if the update feature is disabled.

Now again, I am at my core someone who cares about clients — and user experience. Servers without clients are called space heaters — so it's good to see innovation returning to clients, especially network clients. It's been bottled up in the traditional definition of thin for too long. And although I don't believe in thin (except for one very pure, very low power, unthievable interpretation), I'm a huge believer in the network. And all devices that attach to the network.

So with that as a preamble, allow me to congratulate the Java community on having voted to approve a new Java platform, Java Standard Edition 6, whose arrival via the Java Community Process heralds the single biggest improvement in the Java platform in years. And a vast improvement in user experience. Vast.

With Java now powering more than four billion devices (ahem, network clients), the question we now face is how do we approach the next few billion. And without giving away the answer to that question, I'll leave you with one of my favorite quips:

Different isn't always better.

But better's always different.

Jonathan Schwartz
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Open Source Galvanizing the New Market Economy



If a rising tide raises all boats, then open sourcing is the next big tide in the world of technology. Sun Executive Boardroom is pleased to present an interview with Senior Vice President of Software Marketing Peder Ulander, who joins us to discuss the myriad of doors that open sourcing opens for developers, enterprises and customers.

Q: How do you define open source software?

Ulander: It's essentially computer software whose source code is available under a copyright license that allows anyone to study, change, improve, redistribute, modify, and build on top of it. The goal of open source software is to embrace a community of developers around the software platform and make it freely available and openly marketable. It's a methodology for software development, but also a route to market. For developers, open source is about participation and collective strength. For users, open source is about vendor neutrality and control over the technology.

Q: What are the business benefits to open source?

Ulander: Open source allows customers to engage in various technologies early on in an evaluation cycle without cutting a purchase order. They can download it, use it, get their developers on it, and build a proof of concept that helps them decide if they like it. Risk and barriers to entry don't exist.

Another benefit of open source for a customer is that there is no lock-in to the company that has delivered the source code. Let's use Linux as an example. People liked Linux because it didn't have the proprietary nature of traditional UNIX flavors. It offered the flexibility to run on multiple hardware technologies, delivered by different vendors. In the late '90s, you either ran Solaris on SPARC, AIX on Power, HP on their custom stuff, or Microsoft on Intel. The desire was to get UNIX-level reliability and capabilities with commodity-based hardware. Linux removed the barriers to entry, enabled more choice, and opened up opportunities for customers. The attractiveness to customers was the ability to leverage commodity technologies from multiple vendors, participate in the community, and take advantage of significant cost savings.

The global effect of open sourcing is that barriers are lowered for talking with new developers and customers. We see tremendous potential to expand into markets and regions where legacy infrastructure like wireline telephones don't exist. The global reach of the network enables community participation from all parts of the world. In some places, open source is a mandate. More and more countries are proposing legislation for open source software. Why? Because it allows for economic independence and sovereignty over a part of a nation's infrastructure.

This in turn brings a business benefit to Sun, but the big benefit goes back to that barrier to entry. When you eliminate that for developers and sys admins, they have the ability to create proofs-of-concept or next-generation platforms. They get engaged early on with the software, and can move forward to production and engage with Sun on larger commercial terms.

At the end of the day, while companies take general open source to do their test cases and proof of concepts, when they go to market with that platform, whether it be a service or business infrastructure, or their entire solution for the market, they generally want to have commercially-supported, commercially-backed, commercially-indemnified technologies when they go to market. This means they are going to come to Sun for commercial licenses and a partnership.

At the end of the day, companies generally want to have commercially-supported, commercially-backed, commercially-indemnified technologies when they go to market.

Q: What are the business benefits to a standards-based approach?

Ulander: Open standards-based solutions give businesses increased compatibility and the freedom to select the components they want, to build their infrastructure from a wide range of vendors who support the published standard. There is an element of hardware neutrality as well. The widespread adoption of commodity hardware and the massive scale in the datacenter presents a unique opportunity for open source. A move toward standardization permits flexibility and cross-platform interoperability for customers to merge systems and introduce efficiencies in their datacenter.

Q: What are the risks associated with open source?

Ulander: If open source presents a risk to your business, it's more contingent upon what your business is rather than what open source is. There is a lot of noise in the industry that some open source software contains unlicensed intellectual property. Is that a risk if you are selling or using that software? Perhaps — if you think you will be the target of litigation. For many folks, the answer to that is no. You may want indemnification from your supplier. Consider too the risks of proprietary software — large sunk costs not recouped, dependency on a particular vendor, and a similar theoretical risk with IP.

For the producer, the risks might also be that the market you're entering or creating is much more competitive. You have to innovate and stay on top of your game. Look at how Oracle just came into Red Hat's market. To stay competitive, Sun looks to standardize on everything that doesn't differentiate us. That's what our customers want and it brings the right focus to our engineering efforts.

Whether you are dealing with proprietary software, free software, or open source software, the risks involved are always a result of the actions taken by the company that has built that technology. If a company is contributing a small percentage and goes out of business, that's a risk. Sun is the largest contributor to our open source platforms and communities. We stand behind them.

We are engaged and continue to evolve development to ensure there is continuity, road maps, etc. We're concerned with maintaining a level of quality, a level of customer experience, driving the open standards, minimizing the fragmentation, and making sure that when companies want to leverage open source technology, they have a partner who is strongly committed to it.

Q: Why is the network the lifeblood for open sourcing?

Ulander: The Internet has enabled incredible access and inter-connectedness across cultures and continents. The power of the Internet has allowed for tremendous uptake in sharing and collaborating, in which individuals do not have to be co-located in order to share work. Individuals are not even required to speak the same language for this sharing to occur.

Yes, you can have open sourcing without the network, but the network has definitely fueled the whole revolution around open source technologies. If you're betting against open source, you're betting against the global community.

Q: What new markets does open sourcing present?

Ulander: Open source is very important in rapidly emerging economies such as China and India, and also in the delivery of public services. As I said earlier, it offers countries sovereignty. Countries that have been dependent on Western suppliers for software and IT can use open source technologies to build the intellectual property of their communities and deepen the local knowledge base. Open source lets these governments take control of their internal affairs and helps to create new market demand and flourishing businesses, along with local job opportunities.

Open source can also be said to compete with non-consumption — people who are deploying no-cost software who might not have deployed a solution at all. These folks might not be our target customer, but they are driving network adoption and might be serviced by our customers. *A rising tide raises all boats.*

Monetization however, has moved from the point of purchase to the point of value that may be realized at the time of deployment.

Q: Do people have to choose between commercial software and open source software?

Ulander: There is always choice, but people don't have to choose one over the other. They can have a mix of both or use each independently. Just because something is open sourced, doesn't mean it's commercial. Companies that want to deploy on OpenSolaris can do so, and if they need development services or support services, we can help. There are many companies that will never call on Sun because they've engaged in a pure open source model without commercial support. For many large enterprises, however, a key requirement might be systems that are indemnified or have warranties, support, and service level agreements such as is available with Solaris.

Q: How do you make money on open-sourced software?

Ulander: From an investor perspective, if we don't open source our software, someone else will open source theirs. If we don't open source, our markets will shrink because open source is the trend for governments, businesses, developers, and individuals.

Monetization however, has moved from the point of purchase to the point of value that may be realized at the time of deployment, during development or whenever the customer decides to take advantage of the expertise and assurance available. There is a false assumption that support for open source is limited to chat rooms, message boards, and virtual communities. These resources exist, but the benefit is that they exist in addition to the traditional forms of support and services.

Sun's job is to embrace open source to proliferate our technology to expand our market penetration. There are six million Solaris downloads, tens of millions of OpenOffice downloads, and big engagement around Java as that becomes an open source platform.

Look at Google, Yahoo!, or YouTube — we don't pay to use those. These are examples of companies that figured out that free access to consumers' eyeballs is worth money to corporations who pay for advertising and such. This just underscores how services and products can be delivered for free and monetized in unique ways to grow the business.

Open source from a business perspective is about innovation, leadership, and influence, not ownership.

Q: What do you think the future holds in this area?

Ulander: When I look at market and technology trends, I see both traditional enterprises and Web-based companies with strong requirements around integrating applications into the web. The Web is this new platform where everything has to be simple, cheap, and fast. There is only one development model that encourages this new market economy and that is open source.

The traditional UNIXes of the world — HP-UX and AIX — are going away because they haven't become open. Solutions like Windows don't drive interoperability and haven't captured the hearts and minds of the developers building new services. The YouTubes and MySpaces of the world will not be running on these technologies, they will be running on open source.

Sun is committed to engaging these new developers by making 100 percent of our software open source. From the kernel, all the way up to the Java layer, to the user identity layer, we are open sourcing everything to encourage, embrace, and engage with next-generation developers and enterprises.

About Peder Ulander

Peder is vice president of Software Marketing at Sun, responsible for marketing strategy and operations for Sun's complete software portfolio. In addition, Ulander oversees marketing and relations with various developer and open source communities.

Prior to rejoining Sun in March 2006, Ulander spent 18 months at MontaVista where he had global responsibility for driving MontaVista's product and marketing strategies. He is recognized as a leader in the Linux and open source industry and has a dynamic reputation and a history of introducing award-winning products in new and emerging markets.

Trading Carbon Credits in the Datacenter



Like many organizations, [Concentric](#) is confronted by a dilemma in its datacenter. Customers of its hosted applications and email services demand greater performance. But costs for power and cooling would skyrocket if Concentric, a 14-year-old business unit of XO Communications, simply added more servers to answer the demands of its business.

Concentric's innovative solution is giving it the best of both worlds. Sun recently spoke with Barbara Branaman, Concentric president and general manager, about how Sun Fire T1000 and T2000 CoolThreads servers are instrumental in enabling it to realize massive throughput, while reducing power, cooling, and space requirements.

Q: At most enterprises, ballooning datacenter infrastructure is the source of skyrocketing energy consumption. Is that true at Concentric?

Branaman: You can add energy price increases to the list of inevitabilities that also include death and taxes. For the last two years, our colocation customers who control their own equipment and power consumption have increased our power bills by up to 25 percent annually. We, in turn, then pass some of these increased bills back to these customers, which is fairly standard in the colocation industry.

Q: How do these costs break down? How much of the increases are due to the rising cost of electricity and how much stems from server power requirements?

Branaman: I wish I could say that most power cost increases come from inflationary energy markets, but the reality for the last couple of years is that up to 80 percent of this equation derives from increased server density. Companies require ever more processing power. For instance, our colocation customers gain more performance from their existing racks because of increased server density.

But it's important to understand that there are other reasons why companies that run email services such as Concentric need more processing power. For one thing, the last two years has seen a twofold increase in the amount of spam — and our servers that provide anti-spam and virus filtering must scale to meet these increases. Beyond the zombies and botnets that cause these annoyances, anything that uses a back-end database adds to server load. Then there are Web 2.0 applications, which are exciting but often aren't written with scalability in mind. All of these occurrences come with costs that add up to increased CPU utilization and larger utility bills — as well as environmental consequences. And performance requirements are only going to increase.

Q: How does an enterprise address the costs and environmental issues and still meet performance requirements?

Branaman: At Concentric, we try to go straight to the heart of these issues. Hardware virtualization and our patented clustering technologies help us address many of these power concerns by giving our hosted customers the performance they need while granting us more power efficiencies. But the servers we use also need these performance and efficiency qualities — and come with price tags that allow us to remain competitive in the SMB market.

Q: What types of server purchase decisions are you making that will have a positive impact on your power-related costs?

We take a very close look at how we replace servers that we retire. In 2007, we plan to replace many of our clustered machines with Sun CoolThreads servers — the [Sun Fire T1000](#) and [Sun Fire T2000](#) models — because we've found that these machines allow us to do more computing without increasing power consumption. From an infrastructure cost perspective, Sun Fire T1000 and Sun Fire T2000 servers help us ramp our capacity without having to worry about power scalability, and allay our concerns about energy costs associated with older

generation servers. Besides, the price of these servers is very competitive, and that allows us to provide our services with fees attractive to the SMB market.

Q: What about other architecture options that combine performance with energy efficiency? Did you investigate any alternatives to the CoolThreads servers?

Branaman: Last year we investigated CoolThreads servers along with other alternatives for increasing performance and scaling back power use. Ultimately, we decided to go with CoolThreads servers for a couple of compelling reasons. First, we have a long and rewarding relationship with Sun that dates back to the early 1990s. Secondly, we simply could not find any other machines capable of handling a heavy transactional environment at such low rates of power draw.

Ultimately, the Sun architecture was suited for our applications. With 32 compute threads per multithreading processor, a single CoolThreads server acts like 32 distinct servers. As a result, a single CoolThreads server can replace five to eight existing servers that require energy for operation and cooling. Since our software platform is extensively multithreaded, we are able to very effectively utilize the CoolThreads servers.

Q: Are your customers also migrating toward CoolThreads servers?

Branaman: Yes, some of our colocation customers are showing up with T1000 and T2000 servers. But we don't control what kind of equipment customers bring into the datacenters — as long as the servers meet safety and liability standards. In fact, many of our customers come to us because they have high power consumption requirements that our competitors can't meet. We can devote the power savings we get from our CoolThreads servers to make up for the extravagant power demands of our customers — almost like we're trading carbon credits in the datacenter.

Plus, our customers get other benefits from our use of CoolThreads servers. We run a lot of virtual machines that host applications, such as ecommerce stores. During the holidays last December, we discovered that we could simply use a single T2000 to replace clusters responsible for handling transaction traffic for many of our customers. In fact, the customers aren't even aware that we've been swapping out pieces of our hardware infrastructure, because as far as they're concerned, the system just continues to work as they expect.

Q: What other infrastructure challenges does Concentric face in 2007?

Cooling is a big issue, and something we're addressing with CoolThreads servers. Go to one of our server cages, put a hand on just about any server, and the box will feel very warm. But place a hand on a T1000 or a T2000, and the box will be cool to the touch. This means that we don't have to worry about these new boxes straining our climate control systems.

Q: Do the utility companies supplying you with power know about your recent successes in energy reduction?

Branaman: Power companies have their own capacity planning issues to worry about, which is why some utilities actually ask us to minimize server use between the hours of 3:00 and 6:00 in the afternoon. That's not going to happen, of course, because we can't tell our customers to expect decreased services during an exceptionally busy part of the business day. As a result, we're currently investigating the possibility of installing solar panels on our rooftops. The tax credits available make this an attractive possibility for reducing the amount of power we draw from the grid.

Q: What about the possibility of new regulations covering datacenter power consumption?

Branaman: The possibility of new legislation regulating energy draw in datacenters seems very likely. At the end of last year, Congress resoundingly voted to have the Environmental Protection Agency (EPA) study how datacenters can best save energy. The focus, unsurprisingly, will be on servers. What the government will conclude is anyone's guess, but the EPA will discover a lot of inefficient machines out there.

The issue is not so much potential regulations, but rather how well written the legislation will be. It's very possible that companies running datacenters will discover new regulations on the federal, state, and municipal levels of government in the near future, and these companies better be prepared. We're convinced that we're ready to meet new regulatory mandates — as well any new power challenges as the year progresses.

About Barbara Branaman

Barbara Branaman is president and general manager of Concentric's hosting business unit. She has been with the company since 1998, and has held a number of roles including director of product management for hosting, group manager for small and medium business hosting, and manager of user experience. Prior to joining Concentric, Branaman held managerial positions in marketing, product development, system engineering, and interface design at Sprint, Teknekron Communications Systems, Rolm, and IBM. Branaman has an undergraduate degree in Chinese language and literature from Oberlin College where she was a member of the Phi Beta Kappa honor society. She earned her MBA from Thunderbird.