



Announcer You're listening to the Sun Microsystems Podcast Network. Welcome to another edition of *Innovating@Sun*, with your host, Hal Stern. Today's topic, running Moodle on Sun. And now, here's Hal Stern.

Hal:

Hello and welcome to another episode of Innovating@Sun. I'm your host, Hal Stern, Vice President of Global Systems Engineering, and joining me for today's show is Stuart Sim, who's the Chief Technology Officer, Chief Architect and Founder of a Sun partner called Moodleroom. So, Stuart, welcome to the show and tell us a little bit about what you're moodling on. And I'm sure you get that pun a lot.

Stuart:

[laughs] We do, we do. Well, great to be here. We're a service provider for the worldwide education market, both academic and corporate learning, offering any and all services to do with support and hosting for Moodle, which is an open source learning management system, on Sun and only on Sun. We support a fairly large, diverse, worldwide market for all their education needs.

Hal:

So, I have to ask you the obvious question, because it's one, I think, that we get asked at Sun probably on a daily basis – so, Moodle is available as an open source project, it's free to anybody who wants to use it, but yet you have a business based on a piece of free software, so exactly how do you make money?

Stuart:

We offer services over and above all the innovation that's done by the community. So, the Moodle community has been going very strong for a long time; in fact, it's probably one of the healthiest open source learning communities on the Internet, and as a free download, anyone can take any innovation from that community, and even all the innovative artifacts that we offer from Moodlerooms, and put together their own service offering out of self-support, or indeed, offer support for their local community. What we've done is taken a lot of the functional enhancements and the functional richness of that tool and added what we call "operational characteristics." So, we supply all of the hardcore performance and security engineering, if you like, that any large institutions would come to expect from any standard commercial provider.

Hal:

So, there's a difference here between what you can do on the computer and what you do on a computing platform. Just to give everybody a sense of how big this is – what's your user base look like? I mean, if this is a hard problem, obviously, there's some need to show scale here, exactly how many people and how much content are we talking about?

Stuart:

So, at the moment, out of our datacenter, we're supporting over 200,000 distinct users, and we've just completed the first phase of an engineering project we're doing with Sun, to simulate the load of a million concurrent users. And the term concurrent is important there, because essentially, that simulates a single-stack-supported load of well into ten to 15 million users. And we do that, not just to prove a point and as an interesting engineering

challenge, but we're doing that to prove that open source software is – and particularly in this context – ready for prime time, and able to support some of the larger customer users out there, like the large engineering firms in India and China.

Hal:

So, I think if you take a step back and look at Moodle itself and some of the statistics they provide on Moodle.org, you're testing a million concurrent users; right now, there are close to 14 or 15 million distinct users actually engaging with Moodle-hosted or Moodle-managed [overlap] content right now.

Stuart:

That's right. And essentially, we've just become the largest single service provider on the planet for Moodle services, in terms of both hosted and remote services. And Moodle will scale from the simple download to run with a nice, clean installer package on your Mac or your PC desktop; and we want to prove that it can scale from the size of a small support partner or support network within your school to, obviously, the very, very large-scale, multi-institutional scalable platform.

Hal:

And as you mentioned early on, this is not just about universities or K through 12 schools providing content; this is really about any type of an institution – commercial education or otherwise – that's looking to go host their content for training.

Stuart:

That's right. It's truly hosted service where anybody can outsource their training needs, whether it's just-in-time training - for example, Moodle, being as flexible as it is, can handle the kind of rich-detail pedagogical models that you'd need for both higher ed., further ed., and K-12 models, but also through to school and kind of training modules they'd expect out of corporate learning environments. So, there are institutions that are really looking for a cost effective way of handling their compliance training, for example; rather than going for some of the very large ERP vendors, we offer a always up, always guaranteed, hosted service where we do integration into the corporate intranet. So, complete single signons from the secure corporate intranet straight through to this hosted platform. As far as the corporate employees are concerned, they're still on their local intranet.

Hal:

And again, they're able to get access to content that looks and feels as if it came from down the hall in whatever your corporate training office is; it's simply being hosted by an outside service provider.

Stuart:

Indeed, indeed, yeah.

Hal:

So, we talked about Moodle being an open source project, and I think there's a natural tendency to equate open source with x86 or x64 service – basically, things in the Intel or AMD camp. And yet, a lot of what you've built up in the datacenter is built on top of the T2000 – built on top of Sun's Niagara, CoolThreads technology.

Stuart:

That's right.

Hal:

<http://blogs.sun.com/innovation>

So, why? [laughs] Let's get it out there – why? So, why break the obvious assumption?

Stuart:

Because it's cheaper to run. You know, anyone running a datacenter these days knows that power is singly the biggest problem they've got – power and real estate. The T2000 is an excellent machine for its form factor, its performance-priced competitiveness. We run stacks and stacks of T2000s; we've got a special PHP accelerator module running within the CoolStack, which we jointly developed with Sun, to extend the current CoolStack optimization modules, to run PHP faster, cheaper and more powerfully on the Niagara set than we can do on the x64. And unless you're really reliant on a floating point model, then, the T2000 simply is the best machine on the planet to run Web 2.0 apps.

Hal:

Alright, so, this has been a border on blatant commercialization here, but you're running our CoolStack, optimized, open source product – so, you've got Apache and the PHP plugin you've worked on, on top of Niagara chip, with the Moodle PHP-based software on top of that. And you've picked both from a performance and throughput, as well as a power and cooling perspective.

Stuart:

That's right. That's right. And in fact, we found with the loads generation framework, that we're developing and actually going to demonstrate this year – this week, in fact, at EduCause – the technology we chose for building out that framework is one of Erlang, which is the highly, multi-processor language built out of the cell phone industry. But essentially, that just requires a machine that can spawn threads – that's all it needs. And any load generation software really just requires the ability to spawn threads and processes as fast and cheaply as possible. And again, the Niagara chip is simply designed from the ground up to do exactly that, being a web-handling, web-platform machine; that machine is the best possible architecture to generate the load that we need.

Hal:

So, I guess I can speak from a little bit of firsthand experience in that both of my kids go to schools that use Moodle and they find their homework assignments posted there, they find teachers' notes posted there; they'll participate with chat sessions with teachers or other students which, I would say, give them an element of being in a walled garden that's a little bit better than being out there on the open Internet, and at the same time, really give them a sense of direct connectedness back to their teachers, their students, the entire educational staff. And if it's not fast, I mean, the first thing they do is say, Hey, Dad, is the Internet down? So, performance and user experience, particularly with students who are used to the cell phone always being there and AOL Instant Messenger always being there, you have a very high bar to meet in terms of user experience.

Stuart:

We certainly do, and this is actually a real challenge. We've found that in the educational industry, I think that they're the first ones to try to meet the challenge of incredibly high user expectations, because those users are 12- to 16-year-olds, and even younger, and they're expecting everything to be on and available. And they also have a very low threshold for acceptance, so they'll be off, you know, if you can't have a website response time within three seconds – four seconds isn't good enough. And we aim for the two-second mark – that's our service level, because we simply know that the tolerance levels of our users aren't there with the rest of the market. So, we set ourselves very aggressive targets on performance, but then also, on the usability and look-and-feel; so, a lot of the innovation with social networks and look-and-feel, we have to map that whole experience from all the other sites that we know that the end users are visiting – the experience we deliver has to be in line with them. And that's a real challenge for schools these days where they're currently hosting even what we might call an application

that's five years old is legacy in the eyes of these students, and they have to move very, very quickly. So, the challenge to educational institutions is much higher, much higher, in terms of the user expectations.

Hal:

And it's not just in the educational market – if you're looking at corporate training or, you know, any other sort of community-based training, the content's always changing and people will find something else more interesting to click on if it becomes a problem or becomes a drag on their time – or even a perceived drag on their time – to go use whatever the delivery mechanism is.

Stuart:

That's right, yeah.

Hal:

So, I guess the old excuse that the dog ate my homework doesn't work any more; now, it's the DHCP server ate my homework and a whole other set of excuses come up in terms of why things aren't delivered. One of the things I think that's absolutely fascinating about what you're doing is that it's not just a relationship between your customers and the Moodle.org open source project and Sun, there's another party involved here as a service provider. So, you're actually an architect who does deployment with a variety of partners.

Stuart:

Mhmm.

Hal:

Do you want to talk about that a little bit more and how you go and you put your strong imprint on these things to make sure that you're able to go meet those levels of assurance.

Stuart:

Well, we built out our datacenter, we chose Sun as a partner, both in the software and hardware platform side, and we jointly innovate. It's important with the shared ethos with all of our partnerships, we have a fairly wide partnership model, linking back to not just open source projects, but also the list of ISV and system integrator partners that Sun has in the education space. And so, we looked to build out common reference platforms and reference architectures for broad ranges of software solutions that exist, unavailable for the education market. So, those solutions are a mix of both commercial software solutions and open source; we're very careful and like to see ourselves with leaders in terms of the licensing mix, and coming up with practical solutions at the right cost for the market as a whole. And we really look for best of breed, and I think that, you know, working with Sun, Sun, obviously, has a very similar approach to its marketing and its partnering strategy. And so, we definitely share the same kind of story there. In terms of building out the right reference platforms, we pick and choose the right ones that share in the same kind of philosophy towards the education market – just the right mix of products. We're fairly open with our partnering models and we have a very open attitude towards IP, it kind of shares the same ethos with the Moodle.org community, in that we at Moodlerooms, we don't retain any of the software intellectual property; everything that we develop, as we develop out our reference builds for both Moodle and also other open source projects we're linking to, they all get contributed. All those enhancements get contributed back to the community. So, the whole community – and as a result, the marketplace grows, based on all the innovation that's developed both by us and also through the community.

Hal:

Great. So, again the notion of who's actually going and adding to the open source project and that it's all people

working out of the goodness of their hearts. I mean, here you have a viable commercial enterprise that's also, I would say, a valued contributor to the Moodle.org community.

Stuart:

Yes, and we do that, in part, selfishly, for brand promotion and recognition. You know, we want to be the brand that's known for enterprise quality solutions in education, and promoting growth and innovation in the community. We don't – we can't afford all the research engineers that we need, and we also know that we're not the best place to do all the innovations in house. And so, we try and develop the right support networks, both from a technical standpoint, but also fostering a lot of the usability enhancements and all of the functional enhancements – the backend for the community, as well. So, we're working with some of the world's biggest deployments, including the European University, and others, who are deploying Moodle on a truly massive scale, and also making it a very integral part of their service delivery. You can imagine the European University, Moodle as their learning management system is a fundamental, key part of their business, as it is now, more and more so, for traditional schools.

Hal:

Yeah. I want to go up a little bit here and kind of summarize some conversations I've been having with IT executives at universities who are looking at this confluence now of the availability of content which is easy cut-and-pasted into a variety of documents, in many cases, kind of replacing the mail order term paper – if you're pretty good with Google, you can go find content on just about anything you'd ever have to write a paper on. At the same time, what do they do with the wealth of content that's created for courses, some of which, you know, the professors see as their intellectual property, some of which the university sees as its property; some of which wants to get recycled semester after semester, some of which is obviously fresh and related to current events. And I've heard a number of people postulate that the term paper as we knew it, the eight-to-twelve pages on a topic based on the reading from the last semester, is dying – if it's not already dead, it's dying very rapidly. And that educational institutions are working hard to figure out how is it they develop writing and creativity and expository skills without basically teeing themselves up for a bunch of content which is simply cobbled together from whatever people are able to use, using your favorite Internet search tools.

Stuart:

Sure. Very hot topic, as you can imagine, and it really is forcing institutions to take a real hard look – and the whole education sector, as a whole – a hard look at what it means to assess and what assessment technologies there are out there, not just in terms of their pedagogic nature, but also informing identity. And have a look at biometric devices becoming cheaper and cheaper – how do you really know who it is you're assessing at the end of the line, and what's the best way to assess them? You're absolutely right – I mean, there have been huge advancements in things like plagiarism detection, and plagiarism.org and Turnitin have become very popular mechanisms, but it's the same old argument with the cost of security – no matter how much you invest in it, there's always going to be a cheaper, faster way of undoing it. And it really does raise a question of what is the right assessment technology and toolset for today's student? And I think we're seeing, particularly in all the innovation we're seeing in the sector, that's one of the hottest areas at the moment with really looking at group assessment technologies, different functions for evaluating the way in which students collaborate and demonstrate their awareness of learning.

Hal:

And again, I think that if we're – we've been thinking about, you know, what computers would do in the classroom and what computers and computing would do for education, I would say, for the better part of 20 years now. And a lot of things that were held up as the death of the educational system as we knew it, or replacing

teachers, or replacing content all failed – none of those things came true. And what we found is that it's raising our expectations and raising our standards of what it means to go learn something, not just in K through 12, not just in college or university, but once you start working, too. And really, I think a lot of things based on content management, based on the work you do in the Moodlerooms, have forced us to go back and rethink what does it mean to continue to be educated? What does it mean to continue to acquire knowledge and go do something with the content we've made available? Which is, again, different levels of perception, different levels of interaction, different user experiences – clearly what you're going to do for a fourth grader is different than what you do for a 40-year-old engineer. But, it's offered us an opportunity to really go back and revisit some of these things that are decades-old assumptions.

Stuart:

That's right. And a part of the core – one of the core missions of our organization is to continue to support education as it evolves and try and come up with an open platform and support an open platform. If we can reduce the cost of the standard delivery mechanisms as they are now, we are hopefully allowing institutions more time, using their financial resources, but also the time they have available, to try and look ahead, look forward, rather than just try and catch up with what's going on at the moment. And we have found that in many institutions that we're working with, that's indeed been the case, and they've been able to spend their limited resources on looking ahead to the future, rather than just trying to support their – the high demands of the students they have now. And I will say that, again, part of our mission is to try and support the evolution of teaching and learning; but also, to encourage those those learners, to come back and want to continue their learning. So, lifelong learning and the support of this ongoing learning model, so rather than just as a kind of compliance measure, if you like - you know, you have to hand in your essay at this particular time and we can make that process as seamless and integrated with their whole life experience as possible, really, we're trying to encourage students to really want to become better learners.

Hal:

And I would add that it's not just learning the factual things, but in many cases – particularly as you start talking to adult learners – it's learning about the context and the use case, as well. For example, within Sun, there's some initial training you can go through and some examples you can look at to learn how to use our blogging system and to go have a voice that gets heard on blogs@Sun.com. Coupled with that, though, is a bit of informal training around how this relates to your employment contract and what you can and cannot blog about, and what makes a good blog and does blogging about your dog and your cat and your trips to the 7-11 increase your readership more than blogging about the internals of the JVM; and how you go and develop a voice and a readership. Clearly, that's different from learning about the French Revolution, but it's also a learning context that we're trying to provide, now, to 34,000 Sun employees.

Stuart:

Yep. And indeed, makes them a better social participant for the next ten, 20 years on the net – which is where we're going.

Hal:

Absolutely. And again, it's not something that goes away, it's something – simply, our ability to drive education across a very wide and very diverse audience is a continuing challenge here. So, anything you want to add in closing? Any final thoughts for the show?

Stuart:

Just to add onto your comment about content – again, another hot topic, you know, open content, open licensing,

the cost of textbooks obviously a very hot topic here in the U.S. and across Europe, indeed the world, where we're really trying to grapple with this problem. There are a number of different innovative solutions, and I want to say a lot of the projects are really working together, and some of the things that – as well as this kind of hardcore performance engineering, learning the cost of education and learning the cost of systems integration for schools, one of our other interesting areas of focus is this open content repositories. So, looking at linking a lot of open repositories where open licensing and non-restricted licensing models are available for open content so that textbooks can be molded into Flickr models where you can choose your creative license model, and we have federated search repositories across each of the different instances. And we found this huge interest amongst all the different schools in the western world that are putting together open content repositories to try and at least build a model that might support the open publishing of content for education and promoting reuse. So, that's an area to watch.

Hal:

So, social network continues to modulate and inform the educational network, as well.

Stuart:

Mmhmm. [unintelligible]

Hal:

Well, Stuart, I want to thank you for being our guest here on Innovating@Sun. Again, you've been listening to Innovating@Sun with Stuart Sim, Chief Technology Officer and Chief Architect of Moodlerooms, and I'm your host, Hal Stern.

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