

## Cisco Cloud Unfiltered Podcast Series, Episode 15: Randy Bias



Want to win big (or at the very least, survive) in the digital era? Then it's time to stop fighting cloud, choose a strategy that fits your industry, and commit to major, major change. In this episode, VP of Technology and Strategy for the Cloud Software group at Juniper Networks, Randy Bias explains why only the bold will survive in an era where every company needs to become a technology company.

- Niki Acosta: Good afternoon, good morning, good evening, good whatever it is wherever you may be. This is Niki Acosta and this is Cloud Unfiltered.
- Val Benincosa: Woo-hoo! This is Vallard and I'm happy to be here with you Niki, and I'm super happy to be with our guest here today.
- Niki Acosta: Randy, introduce yourself from your home studio.
- Randy Bias: I'm Randy Bias. I am one of the early cloud pioneers and one of the pioneers in the OpenStack space. I'm now at Juniper Networks and just trying to lead the charge into the future and be the disruptor inside the big business.
- Niki Acosta: Never unfiltered, this is why we love Randy Bias, because he always tells it like it is.
- Randy Bias: Always unfiltered.
- Niki Acosta: Always unfiltered, and I didn't know that you were a house DJ. I mean, I guess you spin anything, you said, but you are a big fan of the West Coast house, which is awesome. Do you have any mixes online, Randy?
- Randy Bias: No, I need to start getting them up. I have old stuff but it's really old, from vinyl days. Now I've been moving to [inaudible 01:01] and trying to get all digital and stuff. I still have ... probably can't see behind me, but I have hundreds and hundreds of vinyl records I either have to get a digital version of or transfer. It's a process.
- Niki Acosta: Well not everybody understands house music. A little reference for you, "And we can make sandwiches," old school. All right, anyway, getting back to the topic at hand. We were talking pre-show and there's a lot going on, but before we get there tell us about

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how you got to where you are today, You've had a really interesting technology career and story.

Randy Bias:

It's kind of hard to shorten up, let me try. I started in the Valley when I was 19 and I started doing systems administration engineering, and then moved into network engineering, backbone engineering at ISVs. Then I moved into doing information security for a while. I have this bad tendency to kind of be very, very early, so for example when I was doing ISVs it was 1993, 1994, so it was not even quite transitioned to the commercial internet yet, still the NSFnet backbone. Then information security, it was like 97 to 99, I was really doing it full time. Actually, really into 2003 I guess. I just always was kind of early, and that kind of progressed through SAS and building data centers in Asia.

Then the kind of cloud thing came along and it was sort of this intersection of networking and storage and compute and security, and all that would fit in a mega-data center, and all this stuff was in my sweet ... I engineered all those sort of infrastructure pieces. That's about the time I decided to start my own startup. I started my first startup in 2006, end of 2006 I did this open source tool that nobody had heard of in 2006, called Puppet. Kind of a big thing now, but at the time the entire RC group was maybe 30 to 50 people globally.

I built an orchestration system around it with a couple of buddies so that we could define and deploy and automatically scale up and down an interior web application on this other system called Amazon Web Services Elastic Compute Cloud, which was in private beta at the time. The only thing you could get was a single size VM for 10 cents an hour, that was it. There was no [inaudible 03:23], no DNS, no VDC, nothing. It was way stripped down. That was a little ahead of the curve, didn't quite get there. We decided to scrap that, and then I wound up on my second startup, CloudScale, which wound up being one of the pioneers in the OpenStack space. That was acquired by EMC, and EMC saw me as being somebody who could be a start up guy and server guy and help them transition to more of a cloud-centric vendor business. I tried to do that and then they were acquired by Dell, and that plan got shot down. I moved over to Juniper to kind of do the same thing.

I'm in the cloud software business unit at Juniper and our focus is on doing investments and building more competency around software and kind of the next generation of Juniper products.

Niki Acosta:

What a story, that was good. That was really concise. It's a lot of fun stuff, a lot of parties along the way, a lot of good times back in the ... Are you going to go to the OpenStack summit in Australia?

Randy Bias:

I don't think so.

Niki Acosta:

No?

Randy Bias:

No, I'm going to miss this one. The first one since ... I don't know, since a long time ago.

Niki Acosta:

A long time. We were talking about some of the talks that you've been doing out on the circuit. You've always been kind of one of those forefront speakers at all of the events, but you've been talking lately about services as a platform and continuous response. Tell us about those talks that you're giving, and what the impetus was behind creating those talks?

Randy Bias:

Yeah, so you can find more details on my blog, CloudScaling.com. That's cloud as in "clouds" and scaling as in "scaling mountains." I'll try and just summarize these. Services as a platform is an older notion that some of the other cloud thought-leaders

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and pundits were talking about before, like Lew Tucker, who had a cloud-computing Cisco, and James Urquhart. I just basically observed that if you go look at Amazon Web Services [inaudible 05:31], vast majority of their investments is neither in infrastructure as a service nor as platform as a service nor in software as a service.

Actually there's this fat middle layer in between infrastructure as a service and platform as a service that I'm calling services as a platform. Other people call it different things, IaaS++ I've heard ... These are sort of core functionality that's vital for an application to use, but in and of itself is really just a point solution. It's a single service, so messaging services, data-based services, notification services, queuing services, DNS ... all of those things sort of can be used individually, but really when most people seem to use them for ... when we look at like, Netflix is the best example, is they assemble a fixed number of those Amazon Web Services services together and they basically make a custom PaaS for whatever the application is they're trying to deliver.

I think people are in this ongoing situation where they're like, triaging their existing applications or new applications they want to build and they say, okay, is this something that somebody else can provide for us, like CRM? Okay, let's just go use Salesforce. Okay, that's great, put that away, we don't need to build our own CRM application, that doesn't make any sense." Okay here we have a bunch of utility apps, these are pretty small, they can fit in a very constrained environment, let's just aggregate those all onto a platform as a service system, because that's a constrained system and we can get leverage and operational efficiency that way.

Then you get to like, okay, we've got key intellectual property here that's providing us competitive advantage, like that whole Netflix backend. This is something where we can't fit it in a PaaS. The reality is, is the infrastructure as a service is too low to the ground. You actually need to go and use things like DynamoDB, and we need a messaging service because this is not something we want to build from scratch. We're either going to put it together or not. The service as a platform is just this idea that you can take all these different services and use them to build a platform kind of on a case-by-case basis. That's really where a lot of Amazon Web Services investments is going.

The reason I'm talking about it like this is that I think that people who are going to try to build a private cloud actually have to spend time in that same mentality. Grinding out virtual machines on demand is useless, whereas if they start to provide queuing services and messaging services and running Kubernetes clusters on demand for their developers, then their developers can get 70-80% of the work done for them because you've built that service as a platform system that they need, in the same way that Amazon did. If you don't, if you're just focused on ... you've got object storage and block and VMs and containers, you don't really get them ... You only give them 20% of what they need. That's just why I've been focusing on services as a platform.

Val Benincosa: I love that, so you're calling it services as a platform ... I've also heard something like that called almost as part of what a serverless application is too, does that relate to that somehow?

Randy Bias: I think serverless is one of the services that's in there, right? I mean, people like to get on the serverless hype bandwagon, and you can put everything in serverless. I don't think that's true, serverless has a place just like everything has a place, but you would want a ... function as a service piece is one of the services within a service as a platform system. You would want it to be one of the services in there so that a developer would need to build kind of arbitrate pipelines with multi-stage, that are scaled out ... would be able to do that and have that integrated into messaging and queuing and all the other pieces.

Val Benincosa: Yeah, because I've also thought that the function as a service part would be kind of the glue that stitches these other services together.

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Randy Bias: Absolutely. That's exactly right. Yeah, I think it's very current, that's a very smart observation, yeah.

Val Benincosa: It's services ... platform as a service, is that what ...?

Randy Bias: Services as a platform.

Val Benincosa: Services as a platform, and this is PaaS backwards.

Randy Bias: Yeah, it's almost an inverse of platform as a service.

Val Benincosa: Yeah.

Randy Bias: The terms platform as a service are what I called loaded code and go systems, so you [inaudible 09:36], load the code up, you turn it on. It's more like Weblogic or WebSphere. It's a very constrained environment, whereas service as a platform is an unconstrained environment. You're literally cherry-picking the pieces that you need for specific applications, and then maybe using things like serverless to wire those pieces together so that you can get 70 or 80% of your business process done before you even have to write the key code.

Val Benincosa: Yeah, and I think this is one of the things a lot of maybe Cisco customers, maybe a lot of Enterprise customers are missing, is when they start talking about building a cloud they're like, "Well, just VMs and object storage and we're good, right?" Like you said, it's only giving them 20% or hardly any of what you need, the real value of these clouds are the services that they provide, or the services on their platform.

Randy Bias: Yeah.

Niki Acosta: It's your gateway drug.

Randy Bias: Yeah. Yeah, if I'm a developer and I'm looking at my options, I can go to Amazon and I can get stuff done very, very quickly, or I can go inside and if I'm just grinding through trying to build my own services pieces to put my app on top of it, it takes too long.

Val Benincosa: Yeah.

Niki Acosta: That's the developer point of view. Obviously there's some complexity there, and you have this other notion of continuous response that kind of plays into that. Tell us about continuous response.

Randy Bias: Yeah. I'll lead into that by just capping off the service as a platform thing, I think if you look at platform as a service, that's a focus on developers, and if you look at infrastructure as a service, it's a focus on operators. Service as a platform is really focused on people who are doing DevOps. They're trying to blend those two disciplines. That kind of gets to that second piece of continuous response, which is just ... I've been talking about sort of, hey look, it's not enough for the continuous integration and testing and continuous testing and deployment.

There's actually this third piece, which is Day Two operations, because if you look at the greats who started a lot of ... the whole DevOps movement, you look at a lot of what they do and into the talks and early Velocity conference, a lot of it's not really about the testing and deployment of the code so much as the ongoing day-to-day operations of the code .... how do you understand how it's responding, what do you do in the case of failures and trouble-shooting, and so on.

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There's a whole thing here, a whole category of DevOps discipline that I think is missing, which is continuous response, which is taking about how do we do advanced trouble shooting, how do we do root-cause correlation and analysis ... how can that all be in that same kind of agile methodology. If you look, a lot of people are starting to apply machine learning and artificial intelligence to actually assist the operator in doing a lot of this stuff. Hey, man, I've spent a lot of time doing root-cause analysis and correlation across a problem, and it's not magic. You can have a machine do those 25 steps, extract the logs and tell me where they are across everywhere. You don't have to be ... the operator doesn't have to be the person grinding through splunk or whatever it is to do the analysis. You look at, for example, the new company we acquired, AppFormix, they put a whole bunch of machines already in the algorithms and into the way that they built their operational telemetry tool.

I see this as sort of a thing that's happening across the industry, is people trying to figure out, "Okay, now it's up and running, how do we understand what it's doing? How do we understand how our customers are using it? How do we understand what happens in the case of failures? How do we respond to it?" There's kind of multiple layers to continuous response, which is the break-fix pieces, but then also the long term capacity planning and how do we understand how the system's behaving and the people are using it? You just have to have that final piece there to close the loop.

Niki Acosta:

Do you think that it's the same team that's responsible for continuous response ... is it the DevOps crowd? What I see happening a lot, especially with, I'll say Cisco's traditional data-center-centric customers, is there's really still a large focus on the actual infrastructure itself, the hardware infrastructure pieces ... versus I'll say the developer view, which is you care about your app getting up and running, and then there's kind of this weird thing happening where there's people that are kind of stuck in the middle that are supposed to be responsible for the whole now, but maybe don't quite understand all the pieces. It seems like there's just a big cultural difference in the way that large companies operate versus the way that smaller or medium companies operate.

Randy Bias:

Maybe it might be more accurate to say there seems to be a large cultural difference between the way legacy enterprises operate and newer web-scale/SaaS businesses, right?

Niki Acosta:

Yes.

Randy Bias:

My observation, and I don't know if this is true but it seems to me to be true, is that as enterprises have noticed that there's sort of a big gulf between the line of business and the infrastructure teams, that they're trying to use DevOps as the primary tool for culture change. Now, maybe they're not all successful, I can certainly point to examples of both successes and failures, but it seems to me that a large part of the reason people gravitate ... at least at the management level and the leadership level, towards DevOps is to try to institute that culture change. I think that's the biggest impediment.

I want to give you an example from my own experiences. In 2009 when this was really early on and Cloudscaling was in its infancy and we were doing some consulting, we went to Kaiser Permanente and we were doing some architectural work for them, and it was really interesting because suddenly one day, for two weeks, we didn't hear from the entire IT team. They just disappeared. When the guy came back we said, "What happened?". They said, "Well we had three different failures on KP.org," which is how they communicate with all their customers, how all their patients log in, check their medical records and do appointments and everything. They had three outages in a single month, and the reason was, is because they had a storage team, they had a network team, they had a security team, they had a database team, they had the app guys ... nobody talked to anybody and everybody finger-pointed at each other and it was nobody's responsibility for site-up time.

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When we look at the web-scale guys, we look at the SRE model that Google came up with, we look at how Amazon ... the classic Amazon.com business was run and how the developers became responsible for 24 by 7 up time, and the operators just built platforms for them to run on top of ... you can see it, there's a net new model that is designed for speed and nimbleness and for higher velocity of iterations. It just seems to be very successful, and that's what everybody's starting to gravitate to, knowing that they need to get there to be successful. What I'm seeing is that they're getting pushed more and more and the pain's getting acute enough that they're either going to have to get to that model, or they're just going to have to give up and start consuming public cloud and a lot of those infrastructure people just simply won't have jobs.

Val Benincosa: Yeah.

Niki Acosta: Do you think that's the number one reason why cloud has not been adopted as quickly as I think most expected it to be?

Randy Bias: Private cloud?

Niki Acosta: Yes.

Randy Bias: Yeah, I think the cultural problems are the biggest problem with private cloud. When I have been talking about this stuff for the last six or seven years, I sort of have this other way of talking about it other than pets versus cattle, which was sort of my schtick for a long time, is to sort of talk about assembly line IT versus the robotics factory model of IT. If we look at the way that automobiles were manufactured, even going into the seventies you'd have all these specialists on the line, the person who puts in the steering wheel, the person who puts in the dashboard, tires, yada yada ya. Just like right now, if you're putting an app in the data center, you've got the requirements for it and then you got the server people, the storage people, the network people, the security people. It's an assembly line, you've got all these specialists.

Then the automobile industry moved to more of a robotics factory model, so you had the brain surgeons who understood how to build an automotive factory at scale and deliver the robots and program the robots, and then you have the QA people on the other end. That sort of is really what web-scale guys look like. I personally think that we're in a position now where if you want private cloud, you have to build towards that same model as Google and Amazon. You have to be thinking in those same terms, you have to be doing that robotics factory style IT, you can't just do assembly line because assembly line is clearly going to be displaced.

Niki Acosta: Which would be great if you were starting from scratch, but I see the resistance because a lot of these older companies simply just have a lot of legacy stuff.

Randy Bias: Sure. Yeah, I mean I get it. I'm not going to tell anybody that that's stuff's going to all run on Google and that the need for that stuff isn't going to go away. I've looked at there being three major system shifts over about 60 years now. We had the first major one was mainframes, and mainframe computing there from the sixties into the nineties, early nineties. Then the next shift kind of overlapping with that was the enterprise computing era, which is kind of the eighties into kind of about now. Then overlapping with that now is the cloud computing era. If we look at the mainframe to enterprise computing era shift, what IDC calls platform one and platform two, there's a few things you'll notice.

One, the size of the market was 40 to 100 times bigger in the enterprise computing era. The number of people who had jobs, the labor pool, the number of vendors was 40 to 100 times bigger, everything. There's still mainframes, they're still in use. Visa's still

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doing 25% of credit card transactions on them every single day, but there's not a lot of jobs there and it hasn't gotten any bigger. If we look at the cloud space, we look at Amazon's growth and we see what's happening. All the new stuff is in this new model, and it seems to be getting captured by public cloud. If you want to have that inside your four walls, then you would want to do that.

Does assembly line IT go away completely immediately? No, but do you get in a position where the labor pool gets tighter, there's less jobs, there's less of a focus, people stop trying to run SAP internally for CRM, they move it to Sales Force? Yeah, all that stuff's going to happen. This is one of those situations where you can put your head in your sand and you can pretend that you as the Microsoft exchange admin are going to have a job in the future, or you can get to the reality, which is that Microsoft exchange admin jobs are basically gone, it's just a matter of time, and actually level up and transition your skills. Be a coal miner or start working on solar energy, but pick the right thing for your future.

Val Benincosa: What's going to happen to, you think, private cloud then? Do you think it's going to keep going? Is that market going to expand you think, or is that just ...?

Randy Bias: There's success stories for the people who are willing to put in the money and the time and move to the new model. Microsoft is like a shining success. They moved to that model and became one of the major cloud providers. You've got Walmart who's in process and putting in a lot of effort into it. You've got AT&T. You've got people who are really quiet about it, like Goldman Sachs and Morgan Stanley. Then you've got a lot of aspirational characters that are trying to make the transition ... Citibank and so on. I think that it is a situation where only the biggest companies can really spend that time on it. Apple's spending all the time and money trying to learn. If you're a small or medium business, or a small or medium enterprise, it's hard to see how you can possibly justify spending that money and time, at least at the infrastructure layer. You should really just be going and consuming public cloud.

Val Benincosa: Yeah, and so I wonder then, there's been a number of companies including Cisco and others, EMC, who've offered these private cloud solutions. I wouldn't say they've all been a completely smashing success. Is there ever going to be some type of vendor that could do well with a private cloud service, you think?

Randy Bias: I mean, I think right now that that ship has sailed. OpenStack hasn't been what it needs to be in the time frame that it needed to be. It needed to be a lot more successful a lot sooner than it has been. I mean, we're like seven years in now.

Val Benincosa: Yeah.

Randy Bias: VMware hasn't made the changes that they needed to make. There's really not been anything else going on, and so what I'm observing is that because of the folks executing at the very lowest layers, the infrastructure layers, and because people didn't really understand what needed to happen there, what's happened is now they've gotten to the point where they're saying, "Hey, this isn't really as important as coming up to this new model and changing the culture, and moving towards DevOps, thinking about these new applications differently, and about velocity differently, and enabling developers. Let's just go try to do something else kind of next layer up."

That's where I see people focusing now more on platforms as a service and also things like Kubernetes and containers, where they're looking at those kinds of things as sort of enabling tools that dis-intermediate the infrastructure to a degree, so they can focus on where the value is, which is the net new solutions that they're building, the net new services ... to really enable line of business to go fast. Then the great thing about going that layer up is like, do you care if it's running on OpenStack or VMware or Amazon or Google? No.

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Val Benincosa: Right. Yeah.

Randy Bias: A great example of this is Rad Games, one of Juniper's customers, Contrail's customers took containers in then opened Contrail and then welded them together. Then basically came up with this very stripped down services as a platform basis so that wherever you were as a developer, whether it was on Amazon or on Rad Game's private infrastructure, nobody cared. You'd have the same compute abstraction, the same network abstraction. You could talk about security and networking and compute all using the same model, and you didn't have to relearn whether you want Amazon or their own private infrastructure or bare metal or VMS or containers. It just always looked the same.

Val Benincosa: Yeah, so is the container ... I know that's super hot now, everybody's talking about writing these container platforms and they're great that they go everywhere ... how does that fit in with the services as a platform model? It's almost like you're running these components on there, and they probably consumer things like SMS or ... I'm sorry, the messaging services and things like that, right?

Randy Bias: I am glad you asked this question, because I think this is what is amazing, is that ... Kubernetes in particular, it's pretty clear to me that it's won. Some people still think Docker's in the race, I don't. As an advisor to Docker I think I got some good perspective there. Some people think-

Val Benincosa: You heard it here, you heard it here.

Niki Acosta: Unfiltered.

Randy Bias: Some people think Mace is in the race, I think maybe they're runner up. One of the thing that Kubernetes did really differently than a lot of the other systems is they said, "Look, this is about an entire lifecycle, so we're actually going to specify how the app is deployed, how many instances of a scaling unit and in how many locations. We're going to build in self-healing and resiliency and auto-scaling into the underlying layer so that when you deploy an application, you automatically have ten instances or whatever and it scales up or down. If something goes away, it's automatically replaced. Then, we're also going to define how software gets updated and deployed and how we do rolling upgrades and incremental deployments."

All of the cloud-native-y ways that you sort of manage that new pet-based architecture is just built in. It's just wired in. There's no discussion about how to do it. There's actually thought to application operations on day one, and then what's really exciting about that is that then you can add something like Helm, which adds on top of Kubernetes' way to sort of define that entire application deployment model, so that you've got these charts with describe the whole deployment. What's exciting about that is with Docker, you could get a single container running MySQL, which is not useful. With Kubernetes, you can get a distributed MySQL service running with the push of a button, using a chart. Or a distributed Cassandra service.

For me, Kubernetes is the ideal way that you can actually build services as a platform, because it's taking into account everything through continuous response for DevOps. Then you can have ... you have run a single Kubernetes cluster and you can deploy on it your messaging service and your data storage service. You start to build out all the services. If you look at some of my presentations that are on this in Slide Share and up on the Cloudscaling blog, you'll see that if you went and looked at what Amazon does ... maybe OpenStack can't compete with Amazon and aggregate, and Kubernetes can't compete, but the entire open source [inaudible 26:55] system can, because there's already an open source equivalent for 80, 90% of Amazon Web Services, services as a platform tools.

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Val Benincosa: Wow. It's almost like Helm is the thing that makes it so that Kubernetes can be deployed ... it's like that killer app for Kubernetes, it gives you all those services, that upper layer that you need to actually run on these clouds then? Or to make it interesting for developers.

Randy Bias: That's what I think. That's how I think you can get competitive.

Niki Acosta: In terms of just OpenStack in general, we were talking about this kind of a little bit before pre-show, and you sprinkled a little bit of this in ... Obviously you've got strong opinions on Kubernetes and Docker and everything else, but is there a future for OpenStack in your view now, with the rapid pace of container tech? Is there a place for OpenStack in this future?

Randy Bias: I mean, I don't think in sort of the general marketplace. It seems pretty clear it's going to do well with carriers, and I think it might do okay in sort of the SaaS area, although there's as many ... there's as much anecdotal evidence that it's having challenges there as there is positive anecdotal evidence. In the general ecosystem, OpenStack is the thing that's a counterweight to Amazon, and it's deployed wildly in all the private clouds and all the data centers, and is federated and compatible and interoperable like that. That's done. That's not going to happen pretty clearly as far as I can tell.

Niki Acosta: Where's the primary control point now, for enterprise IT? Is it DevOps owns the services as a platform layer? It seems like everyone's in a battle to try to win the control point. Everyone still wants that, or at least vendors think that everyone wants that single pane of glass to see all the things.

Randy Bias: Yeah, that's where we're all struggling, whether it's Cisco or Juniper or any of the existing enterprise vendors. They're all struggling to understand that there's two emerging sets of control points. One is that it's still the legacy teams for all the legacy mainframe computing era and enterprise computing era systems. That will continue to be for a while, because the people aren't spending tons of time fork-lifting what's on VMware today and shoveling on to Amazon Web Services. Then the other new emerging control point is that the application developers in the line of business are beginning to get more and more control because there's more acute competition now, right?

If you're in the hotel industry, Air BnB is like, all up in you right now. If you're in the taxi industry or logistics industry, you know Uber's up in you. These people are going to have like, self-driving semi trucks and stuff. It's getting real. People who sit in their vertical, whether it's health care or financial services or logistics or whatever, and they say, "Well I'm just safe here because I'm the expert at my vertical," those people are in trouble because somebody else is coming in and they're saying, "I'm a technology company first and I'm going to apply technology to solve these problems in new ways," and they're becoming experts at the domain. They'll become experts fairly quickly and then they're going to apply technology better than you.

Right now, it's existential. Every single large enterprise needs to understand they're a technology business first and then they're a specialist in their vertical second. If they don't do that, then what happens is some upstart or startup comes in and starts using technology leverage against them, and then they haven't built the DNA or culture around that so that they can actually be competitive. What's happening is that the control point is now becoming the developer in the line of business. In the past, those people would have had ... there would have been a stranglehold because the infrastructure teams would basically blank-block them to keep them from getting-

Niki Acosta: Hey, is that a Scaramucci [inaudible 03:11]?

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Randy Bias: -their application deployed, but now they have the choice of just going straight to the public cloud because they can make the case to CEO and CFO that getting this thing done in three months time versus eighteen months time is critical to their success, and they will win. At the end of the day, all businesses, and this is really hard for infrastructure people and security people to understand ... all businesses care more about generating new revenue and creating new opportunities than they do about managing down risk. Yes, they care about managing down risk, but it is always secondary to driving new opportunities and driving new revenue.

Niki Acosta: Yeah. I definitely see that. I mean, I got a notification the other day that an account that I had, something that I bought online from a pool company, that their systems had been hacked and my information had been compromised. It's like, when this happens now, I don't even ... it's not even a big deal. Every company has been susceptible to a hack. Now there's voting data that's out on the dark web. All the information pretty much is out there. I don't think that people are as, I'll say, concerned, at least on the consumer level.

It's not completely foreign to find out that your credit card got hacked or that someone made a copy of your credit card info and swiped it somewhere in another state. I think just about everyone's had that happen once or twice. If that's the case, I see a lot of companies trying to battle it out for AI, because they could look at me and say, "Okay, Niki spends most of her time in Austin Texas but we're getting these weird charges in Philadelphia. We need to flag this immediately and shut it down." I kind of see this AI thing that's happening. It's terrifying.

I read an article today in the New York Times about AI and what the future might look like if so many more things get automated. At that point, it will be the service that is provided that people are going to value, that there's going to be a lot of jobs that are just poof, going to disappear. You see it happening. California, they're testing out all kinds of machinery to try to like, pick strawberries off of strawberry crops because they don't have enough workers right now to be able to fill that gap. The machines aren't perfect, but they figure they've got to do something. If they can't find enough unskilled labor to do it, they've got to figure out a way to keep their crop from spoiling on the vine, literally.

Randy Bias: Yeah, there's been like an escalating set of light bulbs in cloudland, where the first light bulb was like, "Oh, gee, wow, now it's cheaper to keep my data around. That's amazing, I'm going to keep more of it because I might need it at one point." Then the next light bulb was like, "Oh wow, if we figure out how to big data or if we apply techniques, we can actually mine this data that we've been keeping, and get more ideas about how to engage our customers and just how to manage our products and so on in a better way."

Then the next one after that's been like, "Oh, it turns out that if we have machines do a lot of analysis for us in an automated fashion, we can do it even faster so that we can have even faster responses to what's happening to our customers and give them an even better experience." Then I think the sort of subtext under all of that is that if you're doing that, you're keeping up, and if you're doing it first you're getting ahead. If you're not doing any of it you're like, "Oh, what's this?", then you're getting behind very, very quickly and you're becoming very ripe to disruption.

Niki Acosta: Totally. I mean the whole thing behind the New York Times article was like, look, this is happening, it is going to happen, what is going to happen when the governments of a lot of these countries across the world don't have as much income anymore because they don't have wages to tax. It kind of creates this cold domino effect all because of technology. It's unfathomable but hey, if [Jack Maw 35:11] is right and we get to work half as many hours as we do today and nobody bats an eye, that's pretty cool.

Randy Bias: Yeah, that gets in the meta-question, which is, is our society ready to create a leisure society, and have we decided what that means, because there's certain political

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ideologies ... now we're like, off of the computer topic ... that are basically ... it's anathema to them for there to be a scenario where people might spend a lot of their time on leisure or arts or things like that, that they think that that's terrible, but at the same time we are creating more and more of a situation where just the machines can take care of it.

Val Benincosa: Yeah.

Randy Bias: This stuff where we've tried to pretend that there's a certain amount of scarcity ... what do you do when there's really not as much scarcity?

Val Benincosa: Yeah.

Niki Acosta: Yeah. You hang out, you read books.

Randy Bias: I think that sounds good.

Niki Acosta: Do yoga.

Val Benincosa: It's big and large, like on ... like Pixar's Wall-E where it's big and large. We just coast around in our chairs with our Big Gulps.

Niki Acosta: Yeah! Oh god, that's terrifying. Terrifying.

Val Benincosa: I've got a question-

Niki Acosta: So um-

Val Benincosa: Oh, go ahead Niki.

Niki Acosta: Shoot, no, you go.

Val Benincosa: I've just got one question about your continuous response, Randy. If I'm doing continuous integration, I'm doing continuous delivery, where would I start by doing my continuous response?

Randy Bias: I mean, look at the blog posting I did on this on CloudScaling.com, where I really broke it down to three categories of what makes up continuous response. Start there, and then I think the second thing is to just start using the terms, because what we're really trying to do here with adding a term is not so much muddy the water, except acknowledge this something that's already happening. People are doing continuous response today when they're doing it in operations, just they're not thinking about it as continuous response. There's like a body of work and thinking around continuous development and continuous integration that doesn't exist for continuous response that basically needs to. Really it's up to you to sort of get in the conversation and start talking about it and thinking about it as well. I'm just trying to apply a way to categorize that whole group of things.

Then the last thing is, I think, a lot of where the immediate value is beyond just the discussion and having better terms and ways of thinking about it, is to really start looking at what does it mean if you can do operator assistance around using machine learning and artificial intelligence? That's an area that really is underserved right now, so whether you're building a new startup, whether you are an existing enterprise vendor, people are trying to apply these techniques to basically help out.

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What I've realized that's really interesting is that if you look at most systems that are in production ... like I had a buddy here, ran the NOC at Ebay, when you went into the NOC at Ebay, you had this gigantic dashboard. In the dashboard there were zero metrics on like, network interfaces. There were zero metrics on storage systems. All the metrics there were like, how many transactions per second am I getting to the PayPal system? How many auctions just ended? It was stuff that ... the metrics for the NOC were about the business and the business processes, and then they had tooling to drill into, oh, we know that when this transactions per second fade at this time of day, that's actually normal because we've got a roll off of people in one country or another, but then we've got a spike at another point of time in the day that that's actually something that's abnormal.

Part of what machine learning can do is we can apply these techniques to our domain-specific problems that really ... it's not a one-size-fits-all. It's actually, you have to apply it for your particular domain. As you get to learn more about machine learning and you start to apply it for your operational tooling, that can provide a tremendous amount of value in terms of returning service levels, maintaining higher service levels but also returning systems to service more quickly.

- Niki Acosta: In terms of the SLAs then, the SLAs for somebody like Ebay or ... not so much at the infrastructure level but actually at the customer transaction level ... that's a pretty big deal.
- Randy Bias: Yeah, I mean that's where everybody is. They pretend it's not that way.
- Niki Acosta: Do you think that, I'll say the typical large enterprise, is starting to understand why there are competitors eating their lunch and willing to take bigger risks to usher in a new era of new processes and new thinking and new teams ... or at least train existing teams?
- Randy Bias: Yeah, it's definitely happening but it's very different per vertical. There's a high level of variance, right, in financial services, in places like retail for certain. There's a lot more pressure. In other places like healthcare, the pressure is there but it's pretty slack. You see the healthcare guys ... there's a lot of money in the system and so they just throw money at problems rather than technology. There's variance within the entire marketplace, but there's definitely places where the pain is acute versus in a sort of just I know it's happening, but I really don't need to worry about it today.
- Niki Acosta: Right. I have noticed a trend though of, I'll say the simpler, cleaner experiences ... at least happening on the consumer end are definitely starting to impact large enterprises in the way that they communicate with their customers and the way that they ... their social media presence and the way that they service their customers. It is a huge shift, and a lot of these ships are hard to turn.
- Randy Bias: Yeah, sort of for me at the core of all this is what I talked about, the change in the customer engagement model. As people have different kinds of experiences when they go home and they use Gmail or when they're using their Apple products or when they go home and they log into a very modern software as a service interface besides Gmail, like Sales Force or something like that ... is that their expectation levels just get to a different place. Like, why can't you do it like these other folks do it?
- Val Benincosa: Yeah.
- Randy Bias: People get calibrated into one other place and if you're not paying attention, you wind up looking like the dinosaur. As soon as you look like the dinosaur and the perception is that you're a dinosaur, people treat you like the dinosaur and then it's hard to get back in where you should be.

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Niki Acosta: You made an obvious example of a company that has just transitioned on a massive scale, as Microsoft has done. Why do you think that is? You think it was a new CEO coming in combined with market pressures?

Randy Bias: No I-

Niki Acosta: It must have been a really good strategy there for that to happen.

Randy Bias: Yeah, I love those guys. I think they're amazing. I went from maybe ... you could almost call me a Microsoft hater, it wouldn't be quite true but you could almost call me a Microsoft hater, to a big fan. I don't use a ton of their products but I'm a big fan. The thing was is that they did spend 10 to 15 years bleeding red ink. I saw this from the inside, I was doing some consulting for the Hotmail team at one point. They were completely different, sort of thinking about solving problems very differently, and then there was the Xbox Live team, there was the Office 365 team. There were all these teams, for a long time that were very not successful, but they were doing all the learning. If you went back, and you looked at Microsoft's services, year by year it was just bleeding red ink for ten years. Just learning how to build mega-scale data centers ... it was really trivial stuff.

I remember when I was consulting for the Hotmail guys, I went in, and I talked to the [inaudible 43:22] these guys, and they were like, "Yeah, when we first started we couldn't do any automated builds." I said, "Why not?" They said, "Well, visual studio had no command line tools. We actually had to escalate up through our SVP to the SVP who was in the chain of command for the visual studio people to have them build command line tools so that we could have an automated build process for the app."

Val Benincosa: Yeah.

Randy Bias: It was all that stuff. It's all that, so just real hard learning on Microsoft's part, and I think anybody that wants to compete in any way with the web-scale guys are kind of in for a similar timeframe. You're not going to get it done in a year. You're in a five, ten year ... maybe five if you're like kind of slog of changing the DNA, learning how to be a different kind of business, bringing in new blood, creating early successes, building on those successes ... that's what AT&T's been doing, Walmart. That's why I kind of called them out.

I think Microsoft is pretty much ... it's the IMB of this era. IMB was the kind of the mainframe, and then they were about going to be disrupted as we went into the enterprise computing era, and they reinvented themselves more as a software and services company, and then they were able to make that transition. Now we're in that similar form of disruption where all the enterprise vendors ... Juniper, Cisco, everybody sort of has to try to figure out the same transition, and this is why you see people like Cisco frankly, doing things like buying companies like AppDynamics or Juniper buying AppFormix. We are looking at ways to transform the business, and the challenge in front of us is how do we become that next generation of cloud enterprise vendor? It's going to be tough, it's going to be hard. That's part of why I'm at Juniper, which is to help make that happen and make [inaudible 45:05] different happen.

That's part of why you look at our new CTO, we hired him out of Google. We're committed to trying to figure it out. Will we? I don't know, but we're going to take our best shot.

Val Benincosa: I love it.

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Niki Acosta: I definitely see it happening at Cisco. I think Cisco has a unique position, as does Juniper. We've been around forever, there's a lot of complexity in the network ... just a ton of complexity, especially when you start thinking about service providers and what's happening politically with net neutrality. There's just so many things. I do see sort of this interest in creating these simplified experiences. I credit Meraki a lot for that, because Meraki it's like, hey, go online, order this thing, we'll ship it to you, set it up, boom, boom, boom, it's done. Those kinds of intuitive, simple, clean experiences ... I'm starting to see it more in our brand. I'm starting to see it more in the way our products actually look, which is cool. I walk into pretty much anywhere and everyone's always got a Cisco phone on their desk and you can always kind of like peek over and see how old of a model it is. Now the stuff that's coming out, it looks cool. I don't know if that's Apple's doing or what, but I definitely see this sort of trend.

The other thing too is I think that humans just haven't evolved fast enough to be able to process the amount of stimuli that we get on a daily basis. I see people moving to these clean, intuitive experiences in efforts to kind of give their brain a break ... whether it's visual input or when people are putting a summary and letting people know ahead of time, "Hey, this is a long read, but I'm just going to give you this little paragraph and just give you the gist of it upfront because you may not want to spend all your time." I think there's some really interesting studies on time that are happening, to back up this constant stimuli thing. The effect that it has on software and experiences ... with artificial intelligence and self-driving cars and everything else, it seems like it's a pretty cool time to be alive.

Randy Bias: Yeah, I think you're making a good observation there, which is that people want to spend their cognitive computing power, their talent pool, the things that make them special on the things that make them special. When you're doing all the undifferentiated heavy lifting yourself, you can't really get there. You're spending time doing things like deploying an EMC VMAX or whatever, and so is the company next to you. That's not really of any value.

Val Benincosa: Yeah.

Randy Bias: The value is if you're a bank and figuring out some way to increase the number of transactions you can do or start a new market segment where you can get into a drive new revenue ... part of what you're saying on the simplification of the user experience is, I want to remove the cognitive overload. I want to not have to think about things like my wireless, I want it to just work, so I can spend my time on things that actually will make a difference for the business. My wireless system being better than the guys next door will not make any difference to my competitive edge in the marketplace.

Niki Acosta: Carrying around boxes of vinyl doesn't ... you know?

Randy Bias: Yes!

Niki Acosta: Having to wait for a record in Texas knowing there's a 90% chance it's going to come in the mail, not fun.

Randy Bias: You know how heavy one of my crates are? I mean, they're like 75 pounds each. Brutal.

Niki Acosta: Oh man. DJs used to be so fit back in the day, hauling around record bag and crates and tables and stuff. Now it's all digital, it's nuts.

I do see a pivot though. I think that consumers are valuing the human condition. I think consumers are valuing simple experiences, even if they aren't as full-featured. I think people are getting more comfortable with the idea that SaaS is a thing and hey, it may

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not have this feature now but it will probably have it later, or it's not that big of a deal, they'll get to it eventually. I think people are starting to warm up to that. I credit Google and companies like Facebook and Amazon for leading the charge on just making things incrementally better and getting away from these sort of net 30 cycles of buying stuff and running it as long as you possibly can before you need to refresh it.

Val Benincosa: Yeah, just making a good experience for people.

Niki Acosta: Yeah, that's what it's all about.

Val Benincosa: Huge. Huge.

Niki Acosta: Huge.

Randy, we are about out of time, but I know we can find you at Randy Bias ... B-I-A-S, I can't believe I butchered that, on Twitter. Are you going to be speaking anywhere in the near future?

Randy Bias: [crosstalk 49:55] I think I'm doing something in September, there's like a big SDX event. Do you know about this thing? You guys are probably there, who is this, it's the ...

Niki Acosta: Probably.

Val Benincosa: Somebody is.

Randy Bias: SDX-E. SDX-E.

Val Benincosa: Software-defined-something-exchange?

Randy Bias: Yeah.

Val Benincosa: Software-defined-anything-exchange.

Randy Bias: Austin, yeah. Next month.

Niki Acosta: Oh, it's in Austin! Fun! Give me a call, I'll take you out to dinner. Let's hang out.

Randy Bias: Cool.

Niki Acosta: Good times Randy. Well always, always, always a pleasure having you on. You're always so insightful and you are definitely a trendsetter. The pets and cattle thing we were talking about before the show, you didn't invent that but you took an old example of it that was kind of outdated from like, years before, refreshed it, gave it life, and just like that ... cloud. Pets and cattle, boom.

Randy Bias: I popularized it, yeah.

Niki Acosta: You popularized it. Such a trendsetter. We'll be looking forward to more future trends courtesy of Randy Bias. Always a pleasure.

Randy Bias: Cheers, thank you.

Val Benincosa: Thank you Randy, it was great to meet you.

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Niki Acosta: All right. Everybody say bye.

Randy Bias: Bye.

Val Benincosa: See you.

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