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David Linthicum, Managing Director, Chief Cloud Strategy Officer, Deloitte Consulting LLP

Title: **Using infrastructure pipelines to reduce cloud complexity**

Description: Cloud isn't just cloud. It's multi, hybrid, edge, and everything in between. The complexity can be mind-numbing. In this podcast, David Linthicum talks with RackN's Rob Hirschfeld about how companies can use infrastructure pipelines to better standardize and manage their infrastructure ecosystems—which can significantly reduce complexity. Rob's take is that automation is key, but it has to be standardized. Of course, infrastructure as code plays a critical role.

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Operator:
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David Linthicum:
Welcome back to the On Cloud Podcast, your one place where you find out how to make cloud computing work for your enterprise. This is an objective discussion with industry thought leaders who provide their own unique perspective around the pragmatic use of cloud-based technology. Today on the show we are joined by Rob Hirschfeld. Rob is the CEO of RackN here today to chat about infrastructure pipelines. Welcome, Rob. How are you doing?

Rob Hirschfeld:
David, it's a pleasure to be on the show. I'm doing great, excited for everything that we're going to get to talk about, and really just going into the next season, a lot of excitement about what's coming.

David Linthicum:
Yeah, and I was excited about this conversation because we have a lot of people who operate in the academic side, they do a lot of thought leadership, analysts, people who work within the firm. Love to talk to entrepreneurs, because I was an entrepreneur for a long period of time and loved doing that, certainly innovation and kind of the creativity around that. So, tell us how you came to be CEO of RackN, and what's your background that led you to this?

Rob Hirschfeld:
[Laughter] Boy. I was trained as an engineer, so I'm a tech CEO from that perspective. And early in my career I started doing startups. I cofounded a startup back in '99. That kind of got me interested in that. But the genesis for RackN itself came out of work that we were doing at Dell, where we were building some automation and provisioning software for hyperscale providers. And that looked so powerful to me that I took my role as an architect, which is really cat-herding, and transitioned that into becoming a CEO and doing all the work that it takes to become a CEO from that perspective. It's a lot more—it's a bigger job than I was expecting. There's not the glamour there. I usually describe being a CEO as playing to your weaknesses because your job is to make everybody else play to their strengths, and, so, you pick up whatever's left over on the table.

David Linthicum:
Yeah, I always thought it was the worst job in the company, certainly for startups, because I, too, had a technology background when I was going through my CEO gigs. And the huge weight's on your shoulders. You're there to raise money. You're there to make sales. You're there to make sure that the company runs in a proper way for investors and customers and employees. And if you're playing as part of a team, there doesn't seem to be as much pressure as if you're leading the team.

And that's kind of—and I think that if you're a CEO of a Global 2000 company you have gobs and gobs of people who support you, and typically you're playing a role where you're going to sit in that role for about five years and then be swapped out to go do something else. And when you're CEO of a company, there is no kind of finite end. There is no deadlines, and you're trying to grow the business as quickly as you can to get a lucrative exit for the investors and the employees, and make sure you maintain your technology, and it continues to add value in the marketplace. Did I capture it?

Rob Hirschfeld:
You did, and one of the things that it can also feel like, especially with a new product, is the pushing the rope challenge, because when you're dealing with something like what we've been building, it's not defined, right? Customers don't necessarily say, "Oh, you're going to solve my problem. I know what that is." You have to be able to build demand for your product, and that is something that most people don't think through, right? We're very used to, “Tell me what to do, I'll go build it, or increase my sales quota.” But when you're in a space where you're creating something new and having to explain it to people, that is a monumental challenge. And it's a skill that I thought I had but have realized how much I have to build that muscle.

David Linthicum:
Yeah, it is a skill, and it's thought leadership-based marketing. And back in the '90s, I used to write books around particular areas of technology like enterprise application integration and then go to work as a CTO in that space, in essence, creating the demand and then harvesting the demand as a technology entrepreneur, in this case working with technology entrepreneurs and myself. And that's I think the sequence that people are missing. In many cases, people try to jump into the market that's already, in essence, growing and try to displace the existing players, which are typically going to be better funded than you are, perhaps even understanding the technology better.

And that typically doesn't work. You have to understand you're there to take risks. You're moving into a marketplace with new technology. It's going to be creative and innovative. You're going to have to explain the reason why the technologist exists. And you're going to have to be the complete lifecycle in terms of creating the demand, going through the sales, and then maintaining things afterwards and growing the market in different directions.

So, what do you guys do at RackN? And what do you sell? And tell us about the technology you guys have brought to market.

Rob Hirschfeld:
I'd be delighted to. Our core product is something called Digital Rebar, and it's a software product. And in some ways, we're very different in market than what you might be used to, where it's a lot of SaaS or service providers, or very consulting-heavy around somebody else's opensource project. We actually make a software product that helps companies run their datacenters better. They run it. The self-management aspect is really important. And then we've standardized typical processes that they use inside of their operational constructs, and those standards we then put into the platform. And that actually provides a tremendous amount of value.

Things that companies have been doing over and over again like installing BIOS and operating systems and applications aren't business value-adding things, yet every company seems to be inventing their own way to do it and having their own custom processes. And what we've done is productive, that so it can be standard. It comes out of the work we were doing at Dell where we were helping the top hyperscalers and large-scale datacenter infrastructure providers who each had their own special sauce, special magic. We've been commoditizing that and making it accessible for anybody.

David Linthicum:
So, what would be the value proposition that you would explain to the CFO in the company as to why they should invest in your technology?

Rob Hirschfeld:
So, when companies are running infrastructure—and it could be their own infrastructure down to the bare metal; it could be cloud infrastructure—in a lot of cases what they've done is they do it in a way that's unique to their business process. And sadly, most companies actually have multiple unique processes that they use. They use different tools. They use different vendors. They have teams that aren't collaborating at all. And our value proposition is that we're able to create an end-to-end process, so from the very first time a server is turned on, we have a complete workflow that takes the systems all the way

through that process to eliminate the labor. But we also make it standard—this is where the infrastructure pipeline concepts come in—standard workflows that all their infrastructure, regardless of the vendor and the location of the site, can use. And that really changes the whole dynamic for how you're managing and running and scaling this infrastructure.

David Linthicum:
So, in other words, I have infrastructure that's not leveraged within my datacenter. You guys will be able to find it and leverage it and it becomes part of the process.

Rob Hirschfeld:
And really driving it end to end. We do a lot of, say, VMWare installs for customers, tens of thousands of VMWare installs. And when I say we, our software does it. Our customers run it themselves behind their firewalls. There's no network. We don't take their secrets or their data, right? People are very sensitive about things like that. And they can actually run—we're doing this for banks, and, so, it's high-grade security, all the possible features turned on, completely standardized process.

And that's a huge value, to be able to turn on gear and in an hour or two have it completely set up, ready, provisioning it, and doing work. And even more importantly with ransomware and things like that—and this is standard for our customers—the turnover and resets are really important, what some of our customers call repaving. They can literally say, "You know what? This rack needs to be reset." Push a button and have racks of gear reset, reconfigured, reprovisioned, updated, and put back into service over a coffee break. So, game-changing in how you think about it, and it's very cloudy. Like, that's a very cloud mentality, but done on any type of infrastructure.

David Linthicum:
So, typically, we have infrastructure these days that's connected to public cloud providers. People call it hybrid cloud. I kind of call it a pragmatic hybrid cloud because they're not dealing with a private cloud. In the datacenter we're dealing with traditional servers, which is what you're talking about. And how do you make it easier to kind of work and play well with the public cloud providers directly from the datacenter systems?

Rob Hirschfeld:
The way we do that is really by connecting standard components of the automation together in a modular way, which probably just sounds like spaghetti. When we built the system, the primary mission for RackN was to make it so that when we fix something for one customer, it was going to be fixed for every customer. Every customer would get the benefit of improved processes and standardization and how things are done well.

Rob Hirschfeld:
So, once we built this software so that you could take it apart and reuse pieces and patch the automation, that made it so that we could start targeting specific components of the infrastructure workflow. So, when we think about how the systems are built together, the differences between cloud and bare metal are really very small. If you can isolate them and then create a workflow that chains all that logic and space together, then you've actually made it so that you can create heterogenous infrastructure and make it standard processes to control that.

And that's really at the heart of what Digital Rebar is doing. We can start a workflow, detect the type of infrastructure that's there or build the type of infrastructure that's needed with cloud infrastructure, and then run standard processes all the way through. And they're not standard, like, rigorously standard. They're standard in a flexible way so that different teams can reuse these modules or different types of infrastructure can reuse what's appropriate. It really is game-changing, and it's been part of how we've been able to scale and create this self-management where our customers are doing the work of running their datacenters instead of having to outsource it.

David Linthicum:
Yeah, and this is a problem that I think we're going to have to solve in a better way. So, you're talking about things and we're moving to patterns where people are mixing existing on-premise systems. It could be traditional systems like mainframes, but in many instances it's LAMP Stacks and systems that were built in the last 20 years. So—and then working and playing well with cloud-based systems, and they're looking for management layers that are able to span between them, the ability to kind of provide an abstraction layer, remove the complexity of doing this from the various systems. And that's really kind of the only way I think we're going to be able to allow these things to scale.

In other words, if the datacenter's going to be around, which it always is in my opinion, and certainly cloud's going to be an emerging use case and we're going to move out into edge-based systems and edge-based datacenters and IoT those sorts of things, these kind of things, when you're dealing with infrastructure through abstraction layers, in your case infrastructure pipelines, is something that I think people need to start thinking more about. We always try to do things without automation. Am I right? Am I wrong? Or do you see things maybe in a different way?

Rob Hirschfeld:
No, I love the way you're saying it because I think that's really important. The goal here—none of our customers want to be told, "Here is a new Dell server or an Amazon server and it's different and has a different management style," right? Some of the edge stuff is coming out and it's like a completely new stack, and no customer anywhere wants to be told, "Oh, this is going to be managed in a completely new way than the things that you've been managing before." And, so, the challenge the abstraction isn't stacked neatly like a layer cake.

The challenge is that the abstraction has to be sort of woven throughout the process. And we don't take out, like, a configuration management tool or a provisioning infrastructure as code tool. The thing that's been missing is not those tools; they do a good job. The thing that's missing is pulling a thread with the right state information all the way through and end to make it work, right? For what we do physical, we have to deal with out-of-band management and DHCP and DNS and certificate managers and infrastructure management systems and inventory systems, client systems, right? All of that stuff has to be woven together and made work. You don't replace them; you connect them.

And that's really what makes Digital Rebar different and the infrastructure pipelining so critical. It's about the connections, in some ways just like what people built with CI/CD pipelines, right? I have a whole bunch of stages and I have to connect them all together. That's what we've been doing with Digital Rebar.

David Linthicum:
So, moving forward and looking into the future as to where this technology is going, obviously the cloud is here to stay and that adds a certain amount of value, and I think we're moving in some very productive directions there. But at the end of the day, we're moving from something that's fairly simplistic, namely having a datacenter with maybe a dozen different types of platforms—traditional systems, legacy, those sorts of things—now mixing that with cloud computing where we have another 24 different platforms—LAMP Stack, analogs, things like that that we put up to the cloud, and purpose-built databases—and the ability to kind of move into these highly-distributed systems, edge computing and the ability to support a remote workforce that's leveraging that infrastructure. So, this is something that isn't optional. We're going to have to have these series leveraging these areas of abstraction, so we're putting the complexity into a particular domain and monitoring the complexity through one set of systems where we can do so in a consistent way.

Now what we're seeing right now is kind of an evolution or a move in those directions. When I look at the real world, it doesn't seem to be moving as fast, certainly in the adoption within the enterprise. So, what advice would you give an enterprise as to looking at the future, having a strategy, and how we're going to manage these things moving forward? And what are the core enabling technologies, yours and others, that they want to look into now to get good at when these things start to arrive? Sorry for the long question.

Rob Hirschfeld:
Oh, I like this question a lot because you come back to the thing that we see coming at us really quickly, which is this complexity, rising complexity wave. And this is at the heart of your question. All of these things are coming, and we're not taking them off the table. So, if you look in front of you and aren't terrified of the impending complexity overwhelming your ability to keep up with what's going on, then you're not watching how these systems are evolving. We're not moving into one cloud and then solving all the problems. Even the cloud themselves have huge surfaces with a lot of moving parts on it. And, so, to me, the real challenge that companies need to be thinking about in the next five years is not how do I limit complexity, but how do I manage the complexity, or tame it, is the way we usually describe it, because some of this complexity is needful.

This was our big “A-ha!” in dealing with physical systems. It wasn't that you could make complexity go away, but you had to make your automation complexity resilient. And, so, when I look at what you're describing in the future and where things are going, it's very important that we start thinking about how some things can be standardized this idea of building codes, like building clouds to code so that we have more standard operating practices and standard procedures that are known safe. And I think that even though it's really hard helping wrangle teams to be using standard components or standard processes—this has been a struggle throughout my career, over 20 years of IT teams coming in and then developer teams rebelling against it.

We have to have tools and products that help everybody row together. Just pounding the table and saying, "Automate, automate, automate!" is right now creating more work for more people, and it doesn't necessarily create safe, resilient, and secure systems the way it needs to. I mean, that's what we work with in Digital Rebar quite a bit, is not how do we improve the automation of these systems—we got that pretty well done. It's how do we make it so that, as you automate you can pick up standard modules that allow people to accelerate? And how do you allow people to write modules for a company that other people can use? That infrastructure as code reuse is really important.

And there's a challenge—and you mentioned this in your question, what we call distributed infrastructure, where there's autonomy at the sites, right? We are seeing edge coming. I'm a bit proponent of edge being the future of infrastructure and decentralizing how these control planes are built rather than pushing everything into a client server model in the cloud. But that distributed infrastructure is going to be—each site has to have autonomy. We have to have a way to connect and manage these sites so that we don't have millions of unique sites, even though they're independently managed.

And, so, those are things that are top of mind for us. The amazing component in what we've built and the way we've built it is that as you do more infrastructure as code and make things modular and this infrastructure pipeline abstraction that you were describing really well, those things allow you to then have many, many small sites that are slightly different or completely different but yet have shared management. And that to me looking forward is going to change the industry. We have to have better ways to reuse and share automation and infrastructure and management technologies that then create—everybody hates the word—a single pane of glass. It's really a federated control plane. But those things have to come together. We can't keep track of every team having their own, unique thing. It's not going to work.

David Linthicum:
So, what advice would you give to the rank-and-file enterprise that's looking ultimately to solve this problem? In terms of—and obviously your technology is going to be a viable solution in the business, and moving forward there's going to be other technologies that show up as well. So, how do you see your technology evolving to kind of evolve around the changing nature of the problems we're looking to solve? And what are some of the other key technologies that you guys may partner with to leverage so it's combined? You're able to kind of create a force multiplier moving forward?

Rob Hirschfeld:
The challenge that we see coming is—right, we've done a really good job of building this connected, end-to-end systems. And very much like CI/CD pipelines keep getting more internal components, that is part of what we see as a growth path. You don't want to have an infrastructure pipeline that has gaps in it, like somebody has to do something manual, or where you just hope the networking is configured correctly. You can and they'll still work, but they become much more resilient as you connect more things into it, and that's really the path that RackN is on, is to allow an infrastructure pipeline to create more and more complete control of an infrastructure system.

And our partners for that end up being all of the infrastructure pieces around us, right? Having servers with better APIs and more consistent control systems accelerates what we do. We don't replace those tools and those vendors. Having cloud vendors with consistent APIs that have reasonable control systems makes everything we do easier. And that's really where—the challenge that we see in partners and getting partners on board here is building systems that don't assume they are the single source of truth, and building systems that assume that they're going to be interconnected as part of a flow. Unfortunately, too few systems are built with that in mind. We typically look internally when we build systems and don't think about who's consuming our APIs or what workflows we're part of. And, so, our partners that do that well we really appreciate that and we're able to accelerate each other dramatically, create a lot of value for our customers by helping them be confident in their infrastructure and allow it to have zero touch and faster automation turns.

And then the ones that don't cooperative with that they flash like red lights in our automation and infrastructure because they're just not—they're not fast. They're not consistent. They're very error prone. And customers and people in the industry should watch for those components and those tools and processes where they might work well for the task that they're involved in, but they're not good at collaborating with the things around them. That's the differentiator to me.

David Linthicum:
So, where can we find out more about your product and even the concept out on the web?

Rob Hirschfeld:
The company is RackN, R-A-C-K-N, RackN.com. Digital Rebar is easily linked from there and you'll see us quite a bit on that. And we encourage self-trials of that. So, since it's a self-management product, part of what we sell is a product; part of what we sell is try it and use it and make it— that's part of what you're buying when you work with RackN. The concepts with this—I do a lot of talking about infrastructure as code, and if you go to SREcon or LISA, something like that, you'll see presentations I've done about sort of decomposing infrastructure as code into different components and how to deal with complexity and sort of really improve your infrastructure as code strategy based on business continuity, and also looking at all the pieces and helping them fit together.

David Linthicum:
Well, it's a great story, and I think it's a problem that we're going to have to continuously solve, and ultimately you're going to have to have unique technologies like this, unique approaches to make it solvable. And, so, folks out there, you need to get smart around this technology and other technologies that, in essence, remove us from having to deal with the complexity of an underlying system, because if we do that, we won't be able to scale. Then we won't be able to get the solutions into play and bring up security problems, governance problems, business problems. We can't allow those.

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