

NETEVENTS

GLOBAL PRESS & ANALYST SUMMIT

First Draft

*Session 7:
Rock Solid Datacenter Solutions
Which would YOU choose?*

Sean Hackett

Managing Director, Professional Services, 451 Research

Panellists:

Arpit Joshipura	Vice President of Product Marketing, Dell
Dom Wilde	Vice President, HP
Dhritiman Dasgupta	Senior Director, Product Marketing, Juniper

My name is Sean Hackett, I'm Managing Director at 451 Research. We're a research firm, similar to Gartner, and Forrester and others in that we have a syndicated business; we also do a number of other things. My specialty tends to centre round data centre cloud computing, so I have this session here about Rock Solid Data Centre Solutions. I have three great panellists here. I'll have them introduce themselves quickly, because I know I'll struggle with the names.

Dhritiman Dasgupta

Long and complicated name, just go by DD, first letter of my first name, first letter of my last name; my name is pronounced as Dhritiman, not to be mistaken with Dirty-Man, which I've got a few times.

Dom Wilde

I'm Dominic Wilde, I run Product Management for HP Network.

Arpit Joshipura - Dell

I was here, so I'll give you back 30 seconds.

Sean Hackett

Okay, perfect. I love starting it with this, the cloud changes everything, and I usually have a question mark on it, because I'm not so sure that I agree with this. So I usually have people that give me the roll of the eyes. I think really what's important here is how we define the cloud. So I have heard integration is a service, bare metal is a service, is a new from software, I think is interesting.

What we have really done is we have taken the definition and the IT industry has wrapped it around the boundaries of technology. That is not what it is at all. If you tell me that cloud computing is a new way to consume and deliver resources, then it is going to change everything. The fact of the matter is cloud is changing everything, because end users are ticked off.

IT has become the organisation of no, and speed – they don't have the speed, they don't have the agility, they are soaked by software providers who milk them for maintenance costs for years. So it just got to a point where that is really what's driven the market forward. IT CIOs couldn't care less about how we define cloud. What they want to do is they want to take workloads and applications, map policy against them and find the best execution venue for them; it can be internal, it can be external, it can be cloud shared, it can be cloud dedicated. It's all about choice and it's all about optimisation.

With that intro one thing I'm not doing here is saying that there is going to be four massive data centre providers that rule the world, that's not what I am saying. Keep in mind that I said it is all about choice. There can be micro data centres, latency sensitive applications where latency and proximity is an issue. And there is also going to be a number of – we talk about the internet of things, we talk about batch processing; massive amounts of processing that will have to happen. That is going to happen in some fairly big data centres.

And there is some disruption, and that's what I want to focus the panel on, is disruption. So how this ticked off user base and how cloud has really disrupted the whole value chain, right down through the facility to the network, etcetera.

So these are these big billion dollar data centres, the one up here on the left is Apple's, the one over here is VNSA, big massive, massive data centres, 15, 20 times the size of a soccer field. Google's I think that's in Great Plains, I've been there at that one. But the one that's really interesting, that made me create this slide, was I had a discussion with Christian Bladey at Microsoft. This is Microsoft's new [Boyd] and Virginia data centre.

It is really interesting for a number of reasons, one is it looks different from the others, it is outside, it is open air cooling, it is modular, and they drop those big, they look like big transportation rigs onto slabs and that's how they expand with some modular build. The really interesting thing for me though is there are no generators. So what's happening, the more I talk with Christian, what's happening is we're moving toward this world where we have this software resilient data centre. He said to me, if stuff goes down I don't get called any more, and that's a paradigm shift. So it's this

disruption down into the facility that will drive change into the network, which is where I'm trying to go with this.

What is going to be really important is, how do you build an eco system where you can ensure this resiliency? And it's not the resiliency of the facility; it's the resiliency of the service. For data centre folks and facilities folks, we own Uptime Institute, it's a bunch of facilities guys, when we talk about this their hair stands up. This is a real radical shift, and the implications on the network are pretty big.

So the way that networks have to be architected, if this is going to happen, is you're going to have workloads and mobility, VM mobility happen where workloads are spread out; the real essence of distributed computing. And the architecture of the network's going to change; you can't have a tiered architecture any more. So, what happens with protocols like [Spanning Tree] as we move to flatter networks, we move to [Trill] there's lots of discussion here about software defined networks. There are implications on security and server bandwidth. We talked a lot about bandwidth and Ethernet. Really, data centres will need to be more scalable and more application fluent if they are going to make it in terms of how we move to the next generation.

Just keeping in line with Ethernet and the discussions here about Ethernet, we are seeing this shows results of interviews with end users, gigabyte Ethernet to the desktop, 10 gig Ethernet to the backbone. We're seeing accelerations in all these services as demand rises and we see more of that east-west server-to-server traffic and bandwidths expanding etcetera.

So without further ado I'm going to now turn it over to each one of the panellist and they'll go through a four or five minute presentation.

Arpit Joshipura

This is a different part of the panel, where we actually get to use slides. The problem is, what is our data centre strategy and how do we use networking to enable what's going on? So it is four or five slides to just talk about the networking and the data centre of the future.

Dell's strategy everybody knows, we have transformed from a PC company to a full end-to-end IT service provider company; gaining market share on servers, networking, storage, software services and providing the whole end-to-end IT stack. So, no introduction needed, but that's the value proposition of the new Dell.

Now, having said that, we mentioned and talked about the traffic pattern change, this is fundamentally the disruption that our legacy infrastructure cannot keep up with. Which is, the traffic is going east to west, meaning server-to-server, VM-to-VM as opposed to user and internet or user to the data centre and that's what east-west is for those of you who have heard the term but do not know where it's going. You've got campus on the left, coming into a data centre, whether it's a rack or a server or a blade infrastructure.

These are the workloads that allow these kinds of traffic patterns to change, whether it's a VM migration or a virtual desktop or any of the [inaudible] implementation. So

just keep in mind, new [inaudible] require new architectures, legacy architectures want scale in the data centres.

Then we get to the logical aspects and we have talked about SDN so I won't spend too much time on it. But, as I said, there are three camps on how to solve the problem. There's a camp that says, I'll take my legacy environment and allow it to be programmable, it's still legacy, and we got you by the margins, but you're there.

There's a camp on hypervisor, on the top, that says, don't touch the physical network, we will allow everything in the virtual world. Well, they expect the network to be there. There is a problem there, you need more connectivity.

Then there is the purest, as I said, open-flow based. The challenges there are what do you do with the investment? So our strategy from a networking perspective in Dell is allow for the transition, allow for the hybrid approach but focus on the purest, next generation deployments based on the use case.

With that, I think what I would say is where are we heading? Where are we heading is, your very discrete server, storage, network, compute, software elements that are being discussed in the industry today, and we all have a different point of view on that. But my point of view and how Dell sees the things is, this is all going to come together and look like this, which is a system of unified management where the boundaries of server, storage and network are completely redrawn and invisible to an end user, because all they want is, as Dan said it very well, what's my business application, how do you link it to the infrastructure below, not just network, but the infrastructure below.

So that is my two minute overview.

Sean Hackett

Perfect, next is HP.

Dom Wilde

I'll keep this short and sweet as well. At HP we believe in simplification at the end of the day that's what is needed in the data centre of the future, that's what's needed in the data centre today. What we believe is that in a virtualised and a world where we have to service applications, we believe the customer needs to spend less time on managing the infrastructure and keeping the network alive, and spend much more time on focus on the quality of the business experience; in other words, making sure that they are delivering the services that they need to deliver, in the way that they want to do it.

Now today the problem we have is that most of the time that's not possible, because traditional networks have been configured by trying to guess some future state of the network, some future state of an application, or some future need of an application and statically configure a network; and that just isn't going to work any more. So what we need is the ability to dynamically enable the network to service applications

and indeed allow the application to program the network. So the SDN panel that preceded this talked about many of those points.

In our world, we've developed an architecture based around a simple premise; one size does not fit all. The data centre has segmented. You can't build one architectural design that satisfies everybody's needs. You have enterprises of varying sizes; you have hyper-scale customers who are building out thousands and thousands, if not hundreds of thousands of servers. You have service providers who wish to deliver new and innovative services to a broad, globally distributed, customer base. So one size is not going to fit all, and the important thing is, that the form factor in which we deliver the network has to fundamentally change.

We've already started doing that, with developments like our [Moon Shot] server enclosures, which deliver Arm based processors, thousands of servers in a single enclosure, with the network fabric integrated already in there, and the ability to have that fabric act in unison with the rest of the fabric. Those are the kinds of innovations that are going to be needed, going forward. It is not just about simplifying the fabric; it is also about enabling that fabric to be policy driven. Sean mentioned, as you move forward the policy, the business policy is what you want to focus on, and the network needs to be responsive and reactive in being provisioned.

Then finally, it's not just about the fabric, the delivery mechanism, how we actually physically deliver our data centres, how we enable them to be stood up, is incredibly important as well. So power optimised data centres or pods and the eco pod which HP invented, enables you to deliver thousands of servers, whether they're physical or virtualised, optimised and all ready configured with the network fabric ready to go, drop-in style, alongside an existing data centre or to build-out and scale-out new data centres as well. So there's a lot of innovation in these areas that we're going to see coming.

Sean Hackett

Next up and I don't believe you have a presentation, is Juniper.

Dhritiman Dasgupta

Thank you, I decided not to use slides, instead tell you a story. About five years ago I joined Juniper. It was about the time when the founder of the Company and CTO and a bunch of architects basically tried to solve a really tough problem. The problem was as follows; if time, money, resource and revenue were not an issue, if we could build the entire data centre network all over again, what would it look like? We actually didn't have a nice problem of about \$12b of business that we were doing in data centres, so we could come out and say what we wanted to.

We started looking at and asking ourselves, who taught us how to build data centre networks? At lot of times I get the answer Cisco, but that's okay. The answer actually lies in history; it's the same folks who built campus networks. As Arpit was pointing out, there's a fundamental difference between the traffic flow pattern in campus networks, predominantly north-south and in the data centre it was

predominantly east-west. So we said, why do I have a north-south network, this tree shaped network that we see in the data centres? So we decided to go absolutely clean-slate.

We said, what are the fundamental problems with that architecture, it boiled down to three. First, that network is slow. I started my career as a chip designer, I used to build networking chips, now I wear fancy clothes and present at events like this, but I still remember a few things from my chip making days. Which is, every chip, every switch, every router, anybody who's ever built it, there's a huge amount of time spent in doing just one operation. That operation is opening up a packet, seeing what's inside, closing the packet and sending it to the next guy. So essentially that tells you the number of switches you're going to traverse, you're going to repeat that same, redundant, packet processing operation.

In a data centre, if server A wants to talk to server B, ask yourself, does the first packet, when it hits the first switch, does it know where it wants to go? Absolutely, but it's that ridiculous architecture that makes that same operation repeated over and over again; a complete waste of time, that's what we thought.

The next big problem we saw was with the management of the network. Yes, as an industry we keep building bigger and faster boxes, but there has been no innovation. I think SDN has the promise of fundamentally simplifying how we manage networks. So we said in a data centre, which is 30, 40, 100 switches, think about the pain the network administrator goes through to manage, configure, tweak, not only the individual devices, but the interactions between the devices. We call these protocols, three, four, five letter fancy acronyms. Great, but do you think network operators love it? Absolutely not it's a big pain and that's what gets in the way of delivering the agility.

So those were some of the problems we found, that the networks were inherently slow, repeated packet processing operations, management of the network was an absolute pain. So we said, okay, in the past we took inspiration from the campus network and replicated it in the data centre. Is there any other network we can take inspiration from to build the perfect data centre architecture? Actually there is a network which has been sitting in front of all of us for the last 25 years; it's the network inside a switch. If you think about it every switch has a network inside. It's the network that connects all the ports together; these are the ports, think servers.

Think about that network for a second? Are there any protocols inside a switch? Is it two tier, three tier, five tier? No, every port is directly connected to every other port. The performance is predictable. The switch does not have biases between the kinds of traffic. And, what's most important, you do not manage each of the ports individually; you manage the whole switch as a single entity, with a single IP address. Instead of protocols, we've got this notion of shared state in tables, and we've given these names over time, Mac address table, routing table, security table. But the idea is very simple, all the ports don't start exchanging information with each other, instead they look at these global tables, treat them as the bible, and say, I know what I need to do.

So we thought about that network. We said, is it possible to take that network which has been trapped inside the physical confines of a single switch for the last 25 years, can we take that network and bring it out to the data centre? And that's exactly what we did. I won't get into the details of Q Fabric, that's the product where all of this got instantiated, but think about it this way. Data centres have had to make a compromise between speed, reliability, and scalability. You can have a really big network, but it's going to be very difficult to manage. You can have a very big network, but it's going to be very slow.

Until Q Fabric there was no solution that does all three at the same time. My friend Dom mentioned that one size does not fit all. I absolutely agree with it, but one architecture can fit all. If you can get the benefits of speed, if you can get the benefits of reliability and have the entire data centre managed as if it were one single switch with one IP address and one configuration file that in my mind is the perfect data centre network. In 10 years every data centre needs to be built this way. So, with that I'll end my discussion.

Sean Hackett

Great, thank you. So we had the rock and roll and the head-to-head. Usually I save this question for the end, but I'm going to throw a little curve ball in and ask it now. Each of the vendors come up and you hear the elevator pitch, and at least for me things kind of sound the same. What I'd like them to do, and I'll start with Dell, is to tell me why your approach is different than the others.

Arpit Joshipura

I think once you get to the basic trends, check, everybody is going to say the same thing. When you get to basic problems that we have all solved, everybody is going to say the same thing. The approach to get to a solution is different for different. For us our focus is different in terms of the design for a scalable design point. What that means is our solutions are architected for the largest section of the market, which is really what we call the mid-market. And then we can scale it up and scale it down, versus starting very high-end and then dragging it down. So the design philosophy of that is different.

The second thing that is different from the specialist vendors is that we solve the problem in a holistic manner, software, clients, devices, all the way from thin to thick clients, all the way into the data centre and campus, end-to-end. And break the boundaries of conventional thinking, whether it's server, storage, computer, networking, software, etcetera. So I think from a single vendor traditional approach, specialist companies, we differentiate from that perspective, and from the other larger players we are focused on a section of the market that requires a scalable design point up and down.

Sean Hackett

So, it was design philosophy, holistic approach and it sounds a lot like what HP would say.

Dom Wilde

Yes and no. I think as the largest IT provider in the world we have some unique capabilities. It is not always just about the technology, the technology is obviously very, very important. We all have our different approaches to that, but it is everything that you can wrap around that as well. It's a level of trust with customers; it's a level of access with customers. It's the fact that we have the breadth of offering and technology across our entire business, everything from the desktop all the way up through the data centre and beyond.

But I think the other important element is the services element as well, it's being able to actually consult on this. I would say one other thing that from a networking point of view, but this is true across the whole of HP as well; we take a very transformational approach. You hear a lot of vendors talking about how you look at my nice shiny, bright object and it's a better architecture than that guy's. At the end of the day what the customer is interested in is, I've already made an investment, I already have some sunk cost, how do I get from here to there? That is what we find that people are struggling with and HP is in a unique position to help them to solve that problem and understand the transformation journey and to actually execute on that.

Sean Hackett

And?

Dhritiman Dasgupta

Let me spell out what transformational means. Q Fabric delivers end-to-end, server-to-server latency of five microseconds or less. Let me put that in perspective, any switch out there, the time it takes for a packet to travel a single card on a single switch is in the order of 15 to 20 microseconds, that's one switch. I'm talking about end-to-end in five microseconds or less.

Sean Hackett

In legacy switches?

Dhritiman Dasgupta

Yes. Let me give you another example of transformational. Think your data centre has 6,000 physical servers. You would need at least 125 switches to connect all of these 6,000 physical servers, which means at least 125 configuration files, licenses, an admin staff of at least 20 people to manage that infrastructure. Transformational would be one admin, one configuration file, all 125 switches looking like one switch with 6,000 ports.

Sean Hackett

Good, so another few questions. I guess the next question for me would be pick the most disruptive event that you think is going to happen over the next couple of years in the data centre and then help us understand how you would address that disruption?

Dhritiman Dasgupta

I think it's the sheer growth of data and we're all in the business of data transfer. Data transfer is typically 10 times higher than the rate at which data is getting created. So data is going to dominate, it is by far the biggest trend.

Sean Hackett

So it is data, so how do you?

Dhritiman Dasgupta

The ability to handle the sheer amount of data that's hitting the data centre's today.

Sean Hackett

And what makes Juniper unique to solve that surplus?

Dhritiman Dasgupta

Well, it's the scale of the solutions, it's the elegance. So, think about it this way. The reason why I think a lot of customers are scared or shy of taking their entire data centre and converting it into a whole private cloud infrastructure, is the complexity. You can scale up to a certain point, but at a certain point it becomes so complex to manage that infrastructure that customers actually scale back. And what you get instead of a big cloud, is cloud-less.

So what I'm talking about, with the explosion of data, you need these large resource pools so you can effectively share the load of switching, routing, processing, applications what have you, but being able to do it without adding the complexity, and that's where I think Juniper has a unique advantage.

Sean Hackett

Okay. Couple of minutes a piece, HP and then Dell.

Dom Wilde

I actually think the ability to address the data explosion is just table states. I think a couple of the bigger transformations that are going to occur is really, one around the transformation in the organisational structures themselves, in terms of breaking down of silos and things. I think that's a fairly large C change. But I think the bigger transformation is actually going to be around the focus on the application and the move to – the real move to the "as a service" and cloud. And today HP is perfectly positioned for this, we invented converged infrastructure, so you converge the infrastructure. So you can't just come with a network story, you have to come with a

converged story that talks about how the network is deeply integrated with storage and with the server edge as well. You can't have standalone network story any more.

Then, that transforms into a software defined data centre, as we talked about software defined networking this morning. A software defined layer which defines a business policy that drives that infrastructure. And then about the application delivery of services, which is the convergence of cloud. So, how do you move from the public cloud to the private cloud, back and forth, through the hybrid cloud, and how do you get these different cloud models to transform and interact with each other.

Those are the three big major trends, it's converged infrastructure, it's software defined data centre and it's convergence of cloud.

Arpit Joshipura

We all know and have heard enough trends, so I'm not going to talk about that. I think in my mind the things that are happening that are really, really disruptive is what I call software defined enterprise, or everything. You start off with, what's a software defined PC or a laptop; well it's a thin client, [inaudible]. You go from there to software defined storage, software defined network, software defined servers are already here, it's called VMs.

The point is, as these elements of traditional hardcore physical separation of boxes and infrastructure break these boundaries and cease to exist as we know them, the power of how to solve the problem shifts. That's where I agree with the organisational challenge, because let's face it, if you have \$100 to spend in IT in a data centre, \$70 of those go to the server guys, \$20 to the storage guy and \$10 to the network guy, typically if you look at the market sizing also.

The guy who has the most money is going to dictate how it looks like, and so server admins are becoming converged admins, and they need to look at network very simplistically or [inaudible] no CLIs. So that trend and we've talked enough about SDN, is what's going to change the way data centres are built in the next two to three years, and technologies from us are there today, breaking the boundaries.

Sean Hackett

Okay, great. So just to wrap up we have another couple of minutes for questions, any questions in the audience? Well, thank you everyone. Thank you that was a great panel, and thank you all for your attendance.

[End]