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Conference Debate Session II—Welcome to the Multicloud: One Cloud Provider Can't Fit All. Here's How the Industry is Responding

Chair:

Peter Burris, Chief Research Officer and General Manager, Wikibon

<u>Panellists</u>:

Mansour Karam	CEO & Founder, Apstra
Jean-Luc Valente	VP, Product Management, Cloud Platforms and Solutions Group, Cisco
Galeal Zino	CEO, NetFoundry
Michael Segal	Area VP of Strategic Alliances, NetScout
Jon Mittelhauser	Vice President, Oracle

Peter Burris, Chief Research Officer and General Manager, Wikibon

 [Microphone inaccessible]

…but if we can forward the slide then I will introduce the panellists. Okay. First - I don't know if they put it up there so why don't we just do it. The first one is Mansour Karam - is the CEO of Apstra. Mansour, why don't you introduce yourself very quickly.

Mansour Karam, CEO & Founder, Apstra

I'm Mansour Karam, the CEO and founder of Apstra. Apstra builds software that automates and abstracts out infrastructure to deliver a service layer to business

applications and it does that across the entire lifecycle [unclear] and across all types of network services - connectivity, security, compliance and performance.

Peter Burris, Chief Research Officer and General Manager, Wikibon

JL Valente is at Cisco.

Jean-Luc Valente, VP, Product Management, Cloud Platforms and Solutions Group, Cisco

Good morning. JL Valente. I run the Cloud Platform and Solutions Group portfolio from a product management standpoint.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Galeal Zino is at NetFoundry.

Galeal Zino, CEO, NetFoundry

Good morning. Galeal Zino, CEO of NetFoundry. We connect applications wherever they are. So looking forward to this discussion of how applications and data are going everywhere.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Michael Segal at NETSCOUT.

Michael Segal, Area VP of Strategic Alliances, NetScout

Good morning everyone. Michael Segal, responsible for strategic alliances at NETSCOUT. NETSCOUT assures performance and security of services for the largest enterprises and service providers in the world. The way we accomplish it is through something we refer to as visibility without borders, which is very relevant to our multicloud discussion today. Basically we look at traffic data and convert it into actionable insight regarding key performance indicators for both service performance and security.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Jon Mittelhauser is at Oracle.

Jon Mittelhauser, Vice President, Oracle

I'm Jon Mittelhauser. I run the cloud native group at Oracle Cloud building kind of infrastructure for modern applications [unclear] et cetera. Also the representative for

Oracle on the Cloud Native Computing Foundation. Conveniently for this panel, before this I was CEO of a company that did multicloud management way back when I was one of the guys that started up Netscape with Andreessen. So have certainly been doing start-ups for 25 years and now am at one of the big companies - Oracle.

Peter Burris, Chief Research Officer and General Manager, Wikibon

So these are the stars of the panel. I'm going to diminish my participation by just making a few comments of context and we'll get right to it. So I'm going to make three points and the one that is at the end is the most important. So the three points I want to make when we talk about multicloud is first and foremost is this is being done in the context of business objectives and business outcomes. The fundamental business objective is to start using data as an asset. The difference between business and digital business is really simple. It's the role the data plays within the business. A business that treats data as an asset institutionalises its work differently. It establishes value propositions differently. It sets up different types of engagement models. In many respects, fundamentally digital business is about how we are going to put data to work differently.

That has enormous security implications. It has enormous questions about fidelity and one point to make here is that the notion of data as a new oil in many respects - in almost all respects - is a misnomer. Data is easily copied. It's easily shared. It's easily corrupted. It does not follow the laws of scarcity and that has enormous implications, certainly for all the vendors on the panel and virtually every enterprise on the planet. One of the tests ultimately of whether or not you can conduct or undertake a digital problem is what - the degree of - the relationship between the fidelity of the data and the fidelity of the action that you're trying to undertake and today it's relatively weak in many circumstances. We're applying data to turn products into services. Specifically, data allows us to remove something known as asset specificities.

An asset specificity is the degree to which an asset can - is limited in how it can be applied to different uses. By making things more programmable, more observable, more visible, more optimisable it means that we can apply the rest of the business' assets to a lot of different activities. That's especially pertinent when we come to the notion of a product versus a service. Increasingly, people and businesses want to purchase services - the outcomes that the assets provide more than the assets themselves and in very real respects cloud fundamentally is the process of this move from products to services in the tech industry itself. So as you think about what's happening, in many respects what occurs in the tech industry is a test and precursor to much of what's going to happen in business overall.

But very importantly, while we like to think of this as a major change - and it certainly is - this is a major period of transformation - no question - the cloud is part of some ongoing technology trends. Historically, there have been three was to improve the performance of computing. You can improve it through technology, specifically better silicon, different geometries et cetera. You can improve it through instructions and architecture or you can improve it through parallelism. Dennard scaling and other limits on the technology means we're going to have to find new ways of improving the

performance of computing. That's why you see on the architecture front things like GPUs being utilised, greater utilisation of [unclear] et cetera that lower the cost of each transistor and apply them to do more and interesting kinds of work.

But the real change - the real drive to new levels of performance in computing is through parallelism and fundamentally what the cloud is, it's an architecture for simpler powerful distributed computing. That's really the test of all this. It's not a strategy for centralising computing. So it's part of the ongoing natural process of the computing industry that's intended to make better use of parallel processing as a way of dramatically increasing the performance of computing so that we can apply it to increasingly rich and complex problems. Now, that last point is really important and I want to amplify it before we get into the questions.

Historically, for the past five, six or eight years largely driven by the marketing of some very, very strong companies - very impressive companies - we have thought of the cloud as we're going to move our data into the public cloud and we're going to get access to a lot of services. The quid pro quo is give me your data - which locks you in - and then we'll give you access to these interesting services. But what enterprises want and what the natural attributes of data requires is that we try to keep our data in place where the actions - where it's collected - where the action is going to take place - where it's most secure - where intellectual protection or intellectual property protections are easiest to administer - and we want to move cloud services to the data.

So this is not about moving data into the cloud. This is about moving the cloud and cloud services to the data and the natural organisation of the cloud in 10 years is going to reflect a natural organisation of data, whether it's at the edge, whether it's in the core or whether it's in public cloud attributes. Now, that raises, I don't know, somewhere between three or four million questions I think we can probably agree. But I want to focus on three. The first one is if in fact this - and by the way, my comments are not necessarily everybody's comments. This is not an agreement with me and all panellists can feel free to disagree with me. But when we start here, what are the impacts of data emerging as a or the primary asset? JL, why don't we start with you? What is this - when we think about data and the idea of greater data distribution, what are some of the impacts of how IT is going to think about itself, organise itself, imagine its mission as the notion of data as an asset is elevated?

Jean-Luc Valente, VP, Product Management, Cloud Platforms and Solutions Group, Cisco

So to your point, in addition - so it's not just the data. I think the currency is really the application that we need.

Well, applications are data software but often people would think of data really about the attributes around [unclear] the different objects of the different assets that you're using. The key point is - so first the bigger the data the more [solid it becomes]. So data was liquid for a while. Back to your point about moving the data, if you take a terabyte and you try to move it to the cloud from a private cloud you can do it. It's still going to

take time and cost you money. But if you take an exabyte which obviously today we would generate the volume of data it's almost impossible.

It would cost $30 million actually to egress that to a public cloud. So to your point is what we see is we see a tiering of environment from private environments from customers to whether it is [on prem] or hosted by partners - [where is good location for hosting] to the edge and obviously a very big explosion of the edge ultimately all the way to a device. So that actually creates in terms of the access to the data the - both from a networking and from a security standpoint a lot of new characteristics, challenges and complexity. Although we try to make it simple it becomes a pretty complex event.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Jon?

Jon Mittelhauser, Vice President, Oracle

I was basically nodding in agreement that a lot of it is the connectivity. I mean, one of the main things - we obviously sell to a different type of customer than our competitors like AWS that are selling to kind of the [longtail]. We're very focused on Fortune 1000, government entities et cetera and a lot of our value add is fast connect between our data centres - customer data centres. The data can live in either place but I agree that it's the key asset. I mean, I've had old start-up mentors - you know, keep the main thing the main thing. For most companies in the world their data is their asset. It's not the software - I mean, sometimes the software accesses the data. Here in Silicon Valley the software is often valued but outside of Silicon Valley it's the data or what they do with the data which software helps you with.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Yeah. Let me ask you guys a question related to this. We've seen multiple generations of network formation in the industry. We've seen the idea of devices being the primary thing to network. Then pages being the primary thing to network - Facebook and others [bought an identity]. Are we moving to a world where service and data becomes a primary citizen within networking? What do you think Galeal?

Galeal Zino, CEO, NetFoundry

Yeah. The application or the data is the new edge and agree with Jon connectivity - networking is at the forefront of it and, if you think about it, all networking to date has been built under a different assumption where you had to connect sites together and, again, whether that's public cloud, private cloud, branch offices, data centres, it doesn't matter. Those networks were built to connect sites. Now that the application is the new

edge and data is everywhere we actually need to reinvent networking and the ecosystems around networking to match that new reality.

Peter Burris, Chief Research Officer and General Manager, Wikibon

So it's not necessarily a - although data's physical attributes, it's not necessarily the physical device that we're thinking about. It's actually the asset that is the data [unclear]. Michael, what about you?

Michael Segal, Area VP of Strategic Alliances, NetScout

Yeah. So I want to take a step back before taking two steps forward. So let's think of what does data mean from business perspective. So what do you do with data, right? So the implications of data, we listened previously to a panel regarding machine learning and AI. So obviously use data to train machines. You use data mining in warehouses and data lakes to create business decisions and make them smarter and more relevant to your environment, right? You analyse your environment. So what this means is that many of the aspects related to data means that they need to be analysed in real time and this kind of alludes to the fact that edge computing becomes very important. The data needs to be close to where it's being analysed and where it provides insight in many examples in real time.

Beyond that, if you think of data, data is only as valuable as the intelligence that you can derive from it and in order to derive this intelligence you need to process the data and this is where services and applications based on your question Peter are intertwined with data. The value at the end of the day to enterprises is what intelligence they can glean - how they can accelerate their digital transformation and make it more impactful and more relevant to their business. So from that perspective I think that definitely IT needs to gain visibility and Paul Kraus my colleague from NetScout previously spoke about the ability to understand actually what are your assets and network is a key component of any assets that you have because in this distributed environment - we're talking about the edge and data being at the edge - you need to be able to communicate very action and transaction in a timely fashion. That's the importance of networks.

Peter Burris, Chief Research Officer and General Manager, Wikibon

So if we think about this, one of the things that I find interesting is in many respects - I worked in Roger Schank's lab as an undergraduate a million years ago and many of the algorithms that are currently being used in machine learning [unclear] AI were understood at that time. In many respects, the fact that we are now able to build these very enormous parallel machines using GPUs and related technologies means that for the first time we can actually apply some of those algorithms. It doesn't mean that it's all magic. There are certainly limits. But obviously this has enormous impacts when we think about data and we think about data as a primary citizen within a networking world.

It means we have to start, as we just talked about, forming networks differently. What is - what do you think about that Mansour?

Mansour Karam, CEO & Founder, Apstra

Yeah, absolutely. In a world where we're distributing data, networking becomes a critical foundation and in fact the importance of networking is as high as ever. I think it's a really exciting time to be in networking, even with the complexities. When you think of it, it's about connectivity. You may want to be able to connect workloads that are processing all of this data but also how do you declare and describe security policies and then enforce that in this distributed environment? Compliance - how do you meet compliance requirements and certainly the network takes a central role. Finally, it's all about performance. It's about delivering applications with certain SLAs and ultimately the network itself is critical to making it all happen.

So I think one consequence of all this is that managing networks like one did before just no longer works. You can't manage networks manually. You can't manage networks by configuring devices by hand. It has to be done through software. It has to be done through automation - through powerful automation. You have to have the ability to abstract out all of those network services across all of those domains and you have to have the ability to operate these networks, enforce those policies, set these configurations and verify them remotely. So you can't have humans essentially do this in every location where the data resides. So...

Peter Burris, Chief Research Officer and General Manager, Wikibon

So Mansour just started to segue into the next question, which is what is the relationship between multicloud and networking. JL, I want to give you the opportunity to build on what Mansour talked about because in many respects the cloud is better thought of as a way of building networked highly distributed, highly parallel applications. What do you think about that?

Jean-Luc Valente, VP, Product Management, Cloud Platforms and Solutions Group, Cisco

So enterprises - you know, to the point here, enterprises are picking up a lot of different cloud environments and, again, as we stated earlier we talk about multicloud - we talk about multicloud hybrid cloud which is really a combination of private cloud and obviously a number of public clouds in the form of infrastructure as a service, platform as a service and [SAS]. [Unclear] Oracle is a very good example of offering all of those. At the same time, what's happening is - back to the data and back to the applications - to process the data is we are - I think IDC said very recently 50 per cent of new applications will actually pop up in the next two years and back to the services is how [unclear] bring the new services? Well, you need to bring in a combination of applications and data and those new applications are container - I mean, a lot of them

would be microservice container [unclear] based. There's a churn of the current portfolio. There is a lot of new development taking place.

So how do you leverage actually those different clouds in a secure way with very high connectivity? How do you leverage new technology like service mesh which is, at the end of the day, the key piece here. That's what it goes back to application, is DevOps or DevSecOps if we call it this, those applications that we develop, what level of understanding of the networking do they have and vice versa? I think back to your point is because of the new [unclear] environment that is being built, the - we have to fundamentally completely change the way we do networking. That's where I think container networking, container security is going to push into new areas where we can do [unclear] containers in VM because they're going to be with us for a very long time in a different way that is abstracted both at layer seven, layer four and underneath - both underlay and overlay - that gets back to what you guys do as well.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Yeah. Just building on what both - I lose the mic - yeah. Okay. So just building on what both JL and Mansour were going over, the importance of the cloud is not where the data is, right? It's how it's managed. It's the agility. It's the automation - DevOps - DevSecOps. It's the way that we can manage that data with agility and automation. Once that moves to the edge - and we're getting there, right - once we can manage the edge with that same level of agility and automation then all of a sudden the data and the applications will exist wherever they are best put.

The challenge then becomes how do we network all that together and how do we network all that together without creating structures that take away from that agility and automation? So for example with cloud, fairly centralised, right? I can run some huge MPLS circuits up to a few clouds and call it a day. It might cost me an arm and a leg. I might not like it but I can call it a day. Good luck trying to do that with edge distributed applications and data. Just too many boxes and wires. So that would be the challenge going forward, is how we actually build new networking for that new kind of edge distributed reality.

Jon Mittelhauser, Vice President, Oracle

Well, we talk with a bunch of different companies who talk about doing multicloud and it's been pointed out - I mean, I think we all fall into the trap of trying to oversimplify here. There's - you know, you talked about [Net New] and I - obviously I run the group that does Kubernetes so I'm a big fan of Net New and container. But we really talk to three different - you know, enterprise customers tend to have people in all three of these camps. They have existing legacy applications. They're looking at either a lift and shift or just continuing to run in their existing environment. They have kind of re-architecture applications they want to modernise [unclear] modernising traditional applications and then there's net new. I think the challenge is different across all those three. I'm kind of giving a longwinded answer here but multicloud is similar.

I was talking to a bank in Australia and they actually have regulatory requirements that they don't single vendor anything including their cloud. So we were just about to announce our partnership with Azure - with Microsoft - and I prebriefed them on that and that got them very excited because they could then run multicloud across Azure and Oracle Cloud. That's a form of multicloud. Other forms of multicloud are basically just distributed endpoints - forms of edge as well. They're all different networking challenges. That's why these guys have very successful businesses next to me doing networking because this is a complicated endeavour.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Yeah, extremely complicated. In many respects this relationship is going to evolve over the next few years. I think you'd all agree that this is going to be one of the most fertile areas of invention and innovation, is to further drive this relationship. Michael, did you want to say something?

Michael Segal, Area VP of Strategic Alliances, NetScout

Yeah, absolutely. So in terms of the architecture of the multicloud and what it encompasses, I think of multicloud starting in the data centre. We mentioned microservices. So there is a lot of server farms and a lot of east, west traffic and containers and virtualised environments in the data centre itself. Then you extend it, not necessarily immediately to the public cloud - in some cases to private clouds in [unclear] such as Equinix.

Then you can have several different public cloud providers - Oracle, AWS, Microsoft Azure - and in this environment if you think about the complexities associated with connecting everything, many of them are edge computing environments. So from networking perspective it needs to be more responsive, higher throughput especially over the WAN and more automation. So for automation for example, if we talk about SDN - software defined networking - and products such as Cisco's ACI and VMware's NSX. NSX-T also extends itself to the public cloud and that's another way to incorporate both networking and multi-cloud environments.

From NETSCOUT's specific perspective, I just want to mention that besides the fact that we have very tight integration with VMware and [unclear] to monitor all this east west traffic and north south traffic, it extends additional challenges and also opportunities to instrument pervasively and gain visibility and to enter into services that traverse this very complex multicloud environment.

Peter Burris, Chief Research Officer and General Manager, Wikibon

One comment I want to make here before we go on is that the last panel talked about security. Two comments to tie that panel to this panel. One is that the very nature of data which [unclear] shared very easily means security plays an increasing role in how you define or how you create data and imbue it with asset attributes. I think that's

something that we all have to remember is what will be the role of security in actually ensuring that I get value-added data and other people don't if I don't want them to.

The second thing is that I'm talking with a lot of clients, thinking about how they're going to roll together their [sock and knock] their security operations centre as well as their network operations centre. I think there's going to be a lot of talk in the next few years to what I'll call a multicloud operations centre, which is a maturing of that process so that we can actually look at these distributed assets from a relatively consistent point of view.

One of the reasons why that becomes so important leads to the next question, and Mansour, I'm going to start with you. We keep talking about this data explosion, and both Galeal and Mansour bought this up, but what about this coming software explosion, as we move into a realm where these distributed services are accessed at both applications and data? There's going to be an enormous explosion in the amount of software that's being generated over the next few years. Mansour, what's that going to mean?

Mansour Karam, CEO & Founder, Apstra

Absolutely, in fact the software data centres - because when you think about distributed environments that are scaling continuously, it becomes impossible to do things without software. Automation means software, abstractions means software. You're going to define things in software, enforce policies in software, and at the core of this software is state. Ultimately you need to have the ability to have visibility into what's going on, gather all the states, have the ability to represent all the relationships between all those layers, all those domains.

Have the ability to verify that that's the only way you can verify that indeed your infrastructure is secure, indeed your applications are working well, indeed you're delivering on compliance and performance. So, well designed software, best of breed software takes the central stage. This is why at Apstra [unclear] networking, we like to think of a software-first approach.

Ultimately other organisations in the past have partnered first strategically with hardware vendors, because when you think of infrastructure, you think hardware, you think I need to buy boxes. So, that should be my strategic partner and then once I decide my hardware, then I can go on and decide on what software to use. But in a software-first world, this approach is extremely restrictive because ultimately you are limited to those software offerings that that particular hardware vendor supports.

Rather what we see organisations do in this new world is start by partnering strategically with software vendors so that they define this layer of software first, this service layer. Then once they've done that, then of course hardware is important and they can go on and shop for the hardware that specifically meets their needs.

(Unknown)

On this explosion of software, one of the key areas that is also becoming a complexity to that point is the fact that those applications are composable and many applications more and more have dependencies upon other components or other applications. To your point as you actually distribute them more and more to the edge, one of the key complexities that we see for customers first is even understanding the dependencies between the different parts and the level of connectivity back to the security aspect as well. Then how actually you segment or micro-segment those elements so the level of understanding visibility encryption end-to-end, which is very critical and not always there today when you start stitching all of those elements, become challenges.

Peter Burris, Chief Research Officer and General Manager, Wikibon

That has a major impact and ultimately the fidelity of the representation of the digital with the real, doesn't it?

(Unknown)

Absolutely.

(Unknown)

Similar thoughts here. With regards to software explosion, I don't know, 10 years ago, 15 years ago, most of our businesses used software, we used software within our businesses. Increasingly, our businesses are software, or specifically they're connected software. You see businesses, you see ecosystems, you see entire supply chains that are emerging on the assumption of pervasive, secure, reliable connectivity and networking. That to me is what's really interesting about the software explosion.

Companies like Apstra with Mansour, with [intent-based] networking in the data centre, they've done a lot of this automation and agility. It's fantastic, and in fact I think it's the blueprint for what we will see now extend to out of the data centre and go literally to the edge.

(Unknown)

I think the only thing I would add, I entirely agree about the growth of microservices, the growth of not parallelism but breaking things into chunks, which is a form of parallelism, but means something different usually. I think what's missing to do a lot of what we're talking about is not just the networking but is the standards around things like identity and security and some of the others.

Identity is one of the keys because of [unclear] et cetera. Two of what we want is that software explosion to work together, so there's obviously layers where there's some standardisation either de facto or formal, Kubernetes has won the battle for what the storm would be. But I do think there is some standardisation that we all have to agree on is as major cloud vendors around some of these other things, that in terms of

functions as a service, there was an effort for cloud events to be defined, and that was adopted by all the major cloud providers.

So, Amazon, Microsoft, Google, us, I'd like to see more of that around identity. Microsoft was to work together on identity, but that's really only two of the vendors, right? It would solve a lot of these other issues in terms of composing things.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Jon talked about that issue of identity, because I noted that we've seen [unclear] network formation. Identity is more than the device, it's even more than the individual, it's becoming assumed that it's going to be part of the service. Are we actually also going to get to the world where [unclear] has an identity? That's the direction you're taking?

(Unknown)

Oh sure.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Are we going to see DNS extended to include data?

(Unknown)

I don't know about DNS as a protocol because it's got some issues. But yes, you need some forms of - within our cloud we talked about resource principles, and these are cryptographically strong identifiers for a piece of information. Now we also have identity principles which [map to a human], but we have resource principles for a security policy for example. So, a security policy can be signed and identified as the security policy for a network switch, and that is again we've developed our own way some other people we've tried to adopt things.

The more we can standardise those things as we come up with these connected private, public edge centres, it's going to make those of us who are more of the software side than the networking side, it's going to make our lives a lot easier.

(Unknown)

I think that the software explosion is definitely coming our way and it is very closely coupled with business agility. So, if you think of software as the one key component that galvanises and facilitates business agility, then the transition to micro-services, which is aligned with agile development methodology right, each engineer develops its own micro-service and then they work more effectively together. So, the complexity of the software is also going to increase.

So, if you think of that complexity as being N and the data explosion complexity being another N, so we have the N square complexity, and I think this creates a paradigm shift in terms of the way that we should think about service chain in the traditional kind of service chaining which is similar to the way you would develop your data centre for

example, let's say you have a firewall, you have a router, you have IDS, you have both [balancer]. I think that visibility, and Mansour mentioned, referred to this as well, visibility is going to become an imperative in any service chain that is developed in the modern environment that is multi-cloud and networking driven.

Peter Burris, Chief Research Officer and General Manager, Wikibon

All right, so I don't know if we're going to take any questions from the audience, but what I'll do is I'll quickly - first of all I want to thank the panel. This is a great robust panel, thanks to NetEvents for putting it together and allowing me to run it. Just to summarise a couple of things really quickly, number one, think about the cloud as a way of distributing work and not centralising it.

Number two, the data is going to emerge with the caveats identified here, as a basis for imagining how that distribution of resources will be set up over time. The network is the centrepiece of that process and as a consequence of the way that we end up thinking about things. There's going to be an enormous amount of software, and how that software ends up distributed and how those services associated with those software are proffered for commercial and other use is in many respects going to define the scope and complexity of the multicloud moving forward.

So, if we have a question?

Audience Q&A

(Unknown)

A lot of issues raised about managing software, defined networks and the applications that you want to run, so what is there that you don't have in a management software like Kubernetes to hold these things together and make them visible and more controllable?

Peter Burris, Chief Research Officer and General Manager, Wikibon

If I could summarise the question, is Kubernetes sufficient to pull this altogether?

(Unknown)

In summary yes, the specific questions are about visibility, control linking, applications to networks, all the issues that were raised here. So, I'm trying to understand why a management software or orchestration software like Kubernetes is not able to take care of that?

Peter Burris, Chief Research Officer and General Manager, Wikibon

Does anybody want to? Go ahead please, Mike.

Michael Segal, Area VP of Strategic Alliances, NetScout

This is a great opportunity to clarify different levels of visibility. With Kubernetes you gain visibility into your specific infrastructure, so you can manage and automate the deployments of your infrastructure, container-based infrastructure in this case. What you need beyond that, if you think of a service that is consumed by customers, so what is this comprised of? It is comprised of the application that is running on a network. It consumes different processing, storage and computer resources.

So, service is much more complex than just specific computer environment for example. Therefore, what you need is really to understand how all these different components of the service, the application, the network, the databases, the storage and the infrastructure in general is operating and all their dependences in context. That's kind of the visibility that I was referring to, and it crosses the boundaries of any specific domain and any specific layer.

(Unknown)

But I wouldn't call it end-to-end visibility. Kubernetes is more broadly the - Kubernetes is ecosystem fantastic, especially for east west, fantastic visibility, automation, agility, all the things we've been talking about. Now, to Michael's point, extend that to the edge, extend it to the app, extend it to the user, all of those fantastic constructs, mostly east west constructs aren't there, aren't there yet. To try to visualise that, if you look at most pictures of a Kubernetes-type deployment, and you'll see some ingress controllers, basically the gateway into the Kubernetes environment.

How do you connect to that ingress controller? With a nailed-up point-to-point [DPM], which a few years from now we're going to look at that and say that's absolutely ridiculous. All that greatness of Kubernetes and then we have a point-to-point DPM tethering it down. So, the end-to-end aspect I think is the critical missing gap that we're working on solving.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Before going to the next question, I'll just add I think Kubernetes is a wonderful schemer for how this is going to look, but man, there's going to be so much innovation over the next few years. It's just a starting point. Do we have another question?

Steve Cassidy, PC Pro

It's Steve Cassidy [unclear], I have a confession that I hope illuminates a network issue, and that is that I've just come back from China and the experience of using the internet there is very interesting because it's a mixed IPv6 and B4 environment. I'm intrigued by, and we all were, we had plenty of time sitting there to debug what happens in that environment. I'm intrigued to hear how you cope with no more static IPv4 addresses

and how you get customers to realise they've got a bigger migration coming to them in the B6 world.

Peter Burris, Chief Research Officer and General Manager, Wikibon

I'm sorry, we had a hard time getting the question. Is it that the issue is that there's a lot of legacy and that's leading to different approaches to addressing multicloud, and China has less of a legacy? Does it have an advantage? How is the rest of the world with a legacy going to deal with that?

Steve Cassidy, PC Pro

That'll do, yeah.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Okay, go ahead, Mansour.

Mansour Karam, CEO & Founder, Apstra

I think legacy is always a challenge, and specifically when it comes to multicloud and networking, it's a massive challenge. You're right, if someone is starting from scratch it's easier, our view and what we've seen organisation do successfully is that you shouldn't take on the burden of legacy from the starting point, from the start when you are looking at how the future is going to look.

It's far better to start somewhere where you build infrastructure, you deploy an application in a greenfield. Just take one spot in your data centre if you need to let's say upgrade one portion of your data centre, one portion of your application or your infrastructure, maybe one application, start there and then do that right. Do that with the right technology, in view of what you want to achieve in the future so that you can adopt a multicloud environment.

Once you gain experience with that as you're operating your infrastructure, you can over time go back to your legacy and upgrade these progressively.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Michael?

Michael Segal, Area VP of Strategic Alliances, NetScout

One additional aspect that we see with our customers, obviously if the application is modern, you can lift and shift and move it to the cloud. If on the other hand the

application is more legacy, as you mentioned, in some cases you would analyse the monolithic application, decide how to refactor it, maybe refactor parts of the application and then move them to micro-services environment, either in private or public clouds.

The third option is eventually when the combination of a platform and application that our legacy are approaching end of life, you would need to develop an application that replaces it from scratch and now running in modern micro-services containerised environment.

Peter Burris, Chief Research Officer and General Manager, Wikibon

I think that's an important distinction, that we tend to mix the architecture of the application and call it either legacy or a cloud, but the fact is you can run legacy applications in a public cloud, right? We have…

(Unknown)

And some do.

(Unknown)

Yeah, we have a bare metal cloud, we've announced partnerships with VMware where you can just take your VMware bare metal stack and run it in our cloud. That doesn't make it a modern application just by putting it in the cloud, you get the operational benefits of somebody else worrying about the systems for you, but let's not mix those [unclear].

(Unknown)

A lot of legacy applications provided enormous fidelity for business operations and we can bring cloud services to them. We don't necessarily have to bring them to a public cloud to work. Or go for examples creating [unclear] clouds that have public attributes to them while at the same time…

(Unknown)

Even the distinction between public and private is a little bit arbitrary, because most of our clients are large customers, they're basically running network-isolated, we call them tenancies, but they're literally SDN networked direct back to their data centre and only they can access the stuff within. So yes, they're running in our data centre, but it's really not a public cloud. They're not sharing machines necessarily with other people.

Peter Burris, Chief Research Officer and General Manager, Wikibon

Well there's still got to be some degree of contracting at some point in time to make it less arbitrary, but you're absolutely right. Okay, thank you everybody.