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JNPR - Juniper Networks Inc Tech Talk on Contrail Enterprise Multicloud

EVENT DATE/TIME: MAY 23, 2018 / 4:00PM GMT

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PRESENTATION

Operator

Greetings, and welcome to the Juniper Networks' Tech Talk Conference Call. (Operator Instructions)

As a reminder, this conference is being recorded.

It is now my pleasure to introduce your host, Jess Lubert, Investor Relations for Juniper. Thank you, Mr. Looper, you may begin.

Jess Lubert

Thank you, operator. Good morning, and welcome to our Tech Talk on Contrail Enterprise Multicloud in making hyperscale infrastructure available for every enterprise. Joining me today will be Bikash Koley, Juniper's Chief Technology Officer.

Today's call may contain forward-looking statements. Actual results may differ materially from these forward-looking statements as a result of various risk factors, including those found in our most recent 10-K and 10-Q documents and in other documents that we file with the SEC from time to time. All statements made during this call are made only as of today. Juniper undertakes no obligation to update any forward-looking statements. There will be a Q&A session following this call where we will poll live questions from the audience as well as the webcast.

With that, I will now turn the call over to Bikash.

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Good morning, good afternoon, everybody. Welcome to the Tech Talk on Contrail Enterprise Multicloud this morning. As I joined the company almost a year back from Google, one of the question that I always used to get and I still get from the CIOs of the large Fortune 500 companies, "How do I build an infrastructure that looks like Google's?" Through this talk, everyone should answers that question, how a common enterprise of any scale get to build an infrastructure that looks like Google's.

So as you look at the market, and if we see how infrastructure market is growing, we essentially see a bifurcation that's happening in the infrastructure market. You have the builders and you have the users. The builders are trying to build infrastructure to sell to somebody else as an infrastructure. These are who are commonly called the cloud providers, the Amazon, the Microsoft, the Google, the Facebook of the world, whether it's infrastructure-as-a-service or application-as-a-service. And then on the other side, we have users that use infrastructure to delegate their services. Fro them, it used to be a good mix of building system integrating, putting things together and possibly also renting or buying. More and more this group of users are consolidating their infrastructure into some form of cloud. It's either using public cloud as a service or building on-premise infrastructure that looks likes a public cloud, where their application developers can build on either and take advantage of the economics that each deliver. And the thing that is worth noting here is that we actually support both segments of office users. We are very big incumbents in the cloud operators, and we are serving the builders by offering them much tighter control on the infrastructure that we offer to them.

But today's talk is not about builders. It's about the users. So for the users, what we are really going to focus on is how do we offer them an infrastructure that helps them move to this multicloud world. Now interesting part here is that if you look at this distribution of builders versus users, we offer solutions to both segments. Now as users move more and more from system integration to actually leveraging public cloud or private cloud, think of where the economics is moving to. So they used to buy from large incumbents in their on-premise traditional infrastructure, Cisco is a big one there. Every time they move a workload to a public cloud, they're actually moving there workload to infrastructure that has Juniper in there, but they're also moving this workload away from their traditional infrastructure, that is predominantly Cisco, right? So we're actually on both sides of this distribution, which is a great opportunity and a great advantage for Juniper in this transformation.

Now the interesting part that happens in this world is that we're looking towards a multicloud future, but when we say multicloud, it is truly cloud that exists in public cloud form and cloud that exists in public cloud form -- in private cloud form, and the reality of that, both of these infrastructures are going to be necessary for most enterprises for a long time to come. And the reason being, each of these clouds, they actually has their own strength. If you are on AWS, it gives you excellent operational tools. If you are on GCP, it gives you very strong capabilities in machine learning. If you're in Microsoft, it gives you the software that we are used to using. Similarly, if you're dealing with GDPR or your necessity for applications to be close to user data or other regulatory compliance requirements, you need to build an infrastructure that is on-premise, that's your private cloud. And what you really want is for this whole infrastructure to look like interchangeable, or you want the ability to move your workload and your users seamlessly from one to the other. And the reality remains that you have to do the old and the new for quite some time to come, especially for large enterprises, where you're dealing with a large number of legacy applications that your business and your users rely on, on a daily basis. So it's going to remain multicloud for a long time to come for the enterprises.

And as you see this transformation that is happening, the thing that you notice is that this is actually a very large transformation in IT infrastructure, probably for the first time in last 20 years. If you go back and see the transformation that has happened in Enterprise, yes, there have some transformations that have been product led. There have been discussions on how the architecture of data center has changed from leaf -- from traditional infrastructure to leaf and spine or how programmability has taken a place in enterprise. But they have been mostly getting your traditional architecture more efficient. And there're companies that have done well in looking at the incumbent architecture and making it more efficient. So if you look at the product set that Arista brought to the market. To a large extent, they were Cisco like, and they offered a degree of efficiency and quality to that product, which led to people buying the new set of things. But fundamentally, the product set remains almost the same at the core. It was not a disruption into the incumbency.

The transformation to multicloud offers a clear and obvious requirement for disruption, both in infrastructure and in the solutions that need to be provided. Juniper, historically, has done very well when this disruption has come about. 20 years back, when the world was moving from circuit switch to packet switch, Juniper was the first to bet on IP and completely ignore the old circuit switching world, right? And that has paid off very well for the company. We're doing the same thing here again. We see this massive opportunity to leverage this disruption that is coming into enterprise infrastructure, and we are leading that disruption with the technology that we're bringing to bear.

So what happens when folks move to multicloud world? They're a couple of very fundamental things that happen here. The first one being that the legacy network architecture, it basically dies. You need an architecture where you're able to support your on-prem and off-prem infrastructure seamlessly, which fundamentally means that you have to start with a new architecture. It's not yesterday's architecture repurposed, it's a purpose-built infrastructure for the new world. And by definition, it's going to be multi-vendor and the reason being that you're trying to deal with the legacy that you already have and the new infrastructure that you are trying to build, which means that you have to steal -- deal with what you have in present and introduce the new multicloud architecture that you're trying to build. Now if you are a legacy infrastructure provider, this is actually challenging for you. If you are Cisco, and if you have built your solutions on proprietary architecture like SEI, your options are either open it up, and then that gives opportunities to Juniper to go and play in this multi-vendor environment, or your options are to be closed, and that gives us opportunity to insert in greenfield. Because really nobody in this multicloud world wants to be stuck with a legacy infrastructure for long term, so it's a great opportunity for us.

The other big change that happens is that just the structure of channel is going to change in this new world. And the reason being that the way that distribution happens in this new world is actually different, so there'll be partnership that will show up, a great recent example with Juniper is a very close partnership with Red Hat that we announced yesterday for enterprise insertion. Again, the combination of solutions that you insert in enterprise solutions are different in the multicloud world.

And then last, last but not the least, this world is lot more than product. This transformation is not product-driven. It's actually operations driven. When you are a CIO, what you're looking for is, how do I take control of this multicloud infrastructure without having to replicate the operations team that I have for on-prem and off-prem and AWS and GCP, just an operational side change.

So in order for you to have a multicloud infrastructure that actually works for you, it has to be end-to-end. The reason it has to be end-to-end is because your users are in many places. They can be on your branches, or they can be on your campuses, or they can be out there connecting to your resources from public Internet. Similarly, your data and your applications are everywhere. They're on-prem and they are in public cloud. So if you don't build an infrastructure that is end-to-end, it's highly unlikely that you're delivering to your users what they really want. Multicloud is not really building multiple clouds. Multicloud is building a single infrastructure that spans this multiple cloud. And in order to do that, you just can't have solution set that addresses one part or the other. For example, when you have Cisco ACI in your enterprise data center, it probably supports your enterprise data center use case pretty well, but it doesn't really solve your branch or your public cloud use case. Similarly, if you are using Arista with CloudVision, it's actually pretty good for dealing with physical features that are just Arista's and then orchestrating and managing them, right? But the moment that you want to go to branch, or you want to extend to public cloud, there is no solution. The third example would be when people build SD-WAN as a product. Well, it's solving the connectivity problem over, maybe, public Internet, right? But what about data center? But what about security, end-to-end? What about connecting to multiple public clouds or connecting between multiple public clouds? Those are left for you to solve. This is incomplete, this doesn't ultimately give you the end set that you are looking for.

Now I talked about how multicloud must be end-to-end, but multicloud must also be top-to-bottom. What do I mean by that? It starts with connecting everything. It start with connecting everything where it looks like a signal fabric. This fabric must start in your on-premise data center or it may start in AWS. It all depends on where your journey started, but end of the day, as a CIO, you're looking for a common infrastructure fabric that spans all this infrastructure, so the connectivity must be broad-based, and Juniper has a very rich portfolio of connectivity when it comes to switching, routing, branch connectivity as well as virtual network element, whether they are in the form of Contrail overlay or in the form of virtualized Juniper solutions, such as vSRX and vMX. So you must have connectivity that is end-to-end. You must be able to orchestrate this infrastructure end-to-end. Because if you're not able to orchestrate this complete infrastructure from a single pane of glass, you run into the problem of having 3 or 4 replicated operational teams that are operating each of them, just does not scale for you. And a key part of orchestration is, you must have complete visibility of this infrastructure end-to-end as well. Because again, if you don't have visibility, you don't know what you're orchestrating, you don't know how well your infrastructure is running. There're obviously some assumptions and hypothesis and economic model that goes into your decision as to whether you put your workload on private infrastructure or public cloud. How do you validate those? If you don't have data, if you don't have analysis, if you don't have end-to-end view, if you are viewing your private instances differently from your public cloud instances, how do you even validate your economics and the ROI? You just can't. You must have visibility that is end-to-end.

Last but not the least, often forgotten in this conversation is security. As your parameter goes down, as you expand between your on-prem and off-prem, as a CIO, you want the comfort that all the security policy and procedures that I put in place actually goes with me as I expand this fabric. It has to be single policy, it needs to be intent-driven, and it has to expand as your infrastructure expands. And with that comes all the compliances that you must adhere to, right? So security is a key part. It cannot be a separate solution for you, as you're implementing that.

Last, what we are delivering with Contrail Enterprise Multicloud. The goal is very simple. If you look at other products in this space, the answer is almost always, or I can do physical network infrastructure or I can do virtual. I can do physical bare-metal server, or I can do virtual VMs or containers. I can do on-premise, or I can do public cloud. Our goal is and, it has to be and for a CIO to really build this next-gen infrastructure, must be public and private, must be physical and virtual, must be VMs and containers and bare metal, and must be Juniper and non-Juniper.

The last bit is critically important, because you cannot build an infrastructure that is single-vendor if you're really, truly trying to solve the long transition path that the CIOs are going to have as they move to this multicloud future, because in many cases, the technology that they're going to adopt 3 years, 5 years from now haven't been invented yet. So if you're locking them in into your infrastructure, you are doing a disservice to them. This is what many of the existing solutions do today. They lock the CIOs in into what they are deploying today. And you never know when that leads you to a cul-de-sac, because they actually don't know what technology is coming your way as this technology matures. So it must be able to take in new infrastructure and other vendor solutions as the infrastructure grows.

So here is what we're basically delivering. So imagine you are a CIO, and I'm going to walk you through the lifecycle of an IT infrastructure that you might be building. You are building a satellite data center somewhere, and you have a rack full of servers and a bunch of (inaudible), maybe Juniper, maybe non-Juniper, that got delivered to you, and your goal is ultimately to build a cloud infrastructure that looks like one of the hyperscaler infrastructure. Remember, I started the talk by saying, the CIOs want to build an infrastructure that looks like a Google or a Facebook. That's what you want to build. What we they really looking for is, I rack and stack this bare-metal servers and physical switches and routers. I collect them up in terms of physical connectivity. I give them management access. And something magically takes care of the rest. What does that mean? I need to have an orchestration that discovers what I've plugged in, that pushes the basic image that it needs for the things to build up, that ensures the configuration that each of the servers and the switches that are needed to get it -- get them to a end set to get those consideration. I want to do a leaf-spine IP fabric most likely for my data center switches, because that's what the scalable architecture is in any of the hyperscaler space. EVPN VX-WAN is a great technology for me to still support the legacy L2-based use cases, so I probably want the EVPN VX-WAN. I want to build a fabric, right? I want an orchestration that automagically does that for me. And the way it does that is, I just express my intent. And my intent in this case is build me this fabric with this much of capacity, with this policy. That's what I provide to the orchestration system. This is what we're building with Contrail Enterprise Multicloud. Contrail takes over from a single command center, and it deals with the complete life cycle management of everything bare metal from servers to storage to physical switches to routers to gateways, both Juniper and non-Juniper.

The next bit. Once you've gone through that, as a CIO, the next thing that you worry about is multitenancy, segmentation, my ability to virtualize my workload. So that's where Contrail SDN comes in. It builds the overlay for you. And the interesting bit here is that when we build this overlay, we are not restricted to building it just on-premise. It can automagically take this overlay and extend it over public Internet or direct connectivity to any of the public clouds that you care about, AWS, Azure, GCP to name a few. And it automagically makes the tunnels over public Internet encrypted, so you are not worried about security. That gives you the segmented or multitenant application of the overlay in this case. Once that's done, that's when you start spinning up the workload. So whether it's VM or whether it's containers and whether you're turning up containers with something like Kubernetes or Docker swarm or any of the container management system that are popular. Contrail directly integrates with these orchestration systems and allows you to spin up this workload in the form of either VMs or containers both on, on-prem as well as on any of the VPCs that you may have, on AWC (sic) [AWS] or GCP or Azure. So all of a sudden, what do you have is, I have this workload that I actually don't care anymore where they reside, whether they reside on-prem, or whether they reside on public cloud, they are running on the same overlay, they are on the same extended physical or virtual fabric. They have the same policies that I implement on-prem or off-prem. It looks like a single infrastructure or a single cloud to me that's on multiple clouds.

Okay. So you're done doing turning off the workload, what do you care about the next? You care about security. You care about all the security policies and procedures that you may have had in your legacy data centers maybe as a firewall -- a set of firewall rules, I want to extend them. So there, we bring to bear 2 very critical capabilities. One is, the built-in stateful firewall and microsegmentation capability that we already have in Contrail, which we have been selling as Contrail Security. So Contrail Security takes over with, again, a common intent-driven policy and extends your policy across this fabric from on-prem to public cloud. All of a sudden, now you have a secure fabric, doesn't matter where it exists. But we go one step further. We have our firewall, SRX, where we have a virtualized version, as a matter fact, a containerized version of this firewall, that we call cSRX, whether you want even richer policy or if you just wish to extend what you have done in your physical data center to this virtual infrastructure, spin up a virtual firewall. Spin up a cSRX where it makes sense for you. So you are actually not giving up on any of the parameters that you have been so used to for a long period of time.

And last but not the least, AppFormix, which is our jubilant platform that goes across-the-board. Again, it's an and where the visibility is all about, how do I marry physical with virtual, how do I marry private with public as I go and look into my company infrastructure, and I formally prepared the single pane of glass. We call this whole thing Contrail Command. That's your single control and command center for the whole orchestration, and it gives you complete control and visibility across your whole infrastructure. It's pretty elite. It's pretty elite because if you look at what you can buy from the marketplace, you might have used VMware in your past life. Well, VMware does overlay, and it does virtualization. It doesn't do much for either physical switches or router or bare metal. You may have used Cisco ACI for your enterprise data center. Well, it does physical quite well. It does physical quite well. But it does not do anything with overlay, and it doesn't work in public cloud. You might be using Arista with CloudVision. Well, it's a very nice system for managing Arista switches with building a sort of fabric in your data center. It has no overlay capability. It has no public cloud capability. So you basically are forced to do -- forced to choose between one or the other. It's not a single solution. We are solving the and problem here.

Now we -- people talk a lot about technology transition, and we have all seen this S curve as we have gone through technology transitions, right? Almost always, new comes with a large disruptive opportunity, right? And the greater the disruption is, the greater that opportunity is, and if you are a company that is trying to enter into a space, you almost always think of this large opportunity that I have ahead of me that the incumbents are not playing to, but if you're someone who ultimately owns that infrastructure, or you the user of this technology, you actually have a different problem. You have existing technology. You have legacy. As much as you want to move to this new transition, it is not a -- -- it's not a flip a switch at all for you. You have to ensure that you are not leaving your users and your applications and more importantly, your business behind as you're trying to do this transition. So for you, every large step-function change has a pretty large cost, and we call this thing the transition gap, where if you are a user, it is natural and logical for you to get as much value that you can out of the old technology that you currently own. But at the same time, you're actually looking at the opportunity cost of not moving to the new, and it's a tough challenge for you. If you're a new company, you're always looking into the new opportunities that you have, and people are not closing this gap.

For Juniper, that's where we see the real opportunity. The real opportunity is, we're building a solution where we get to take you there, but we don't forget about where you are today. We get to take you from here to there. And as we do that, we actually open up new business models and new use cases for the users, which is a pretty unique scenario for us in -- primarily for the following reason is, if you look at the vast majority of deployed infrastructure in IT, juniper has pretty good play in enterprise, but we're not the market leader there today. That's the opportunity for us. We actually have no reason to hold onto the legacy incumbency. We want to move you to the new world, but we want to move this -- to make this transition as smooth as possible, because the first -- faster the transition happens, the faster it is -- the better it is for Juniper as an opportunity. So we're here to close the transition gap and of course, we want to be ahead of the curve as the transition happens, so we're ready for the future. And that's what we're solving for Contrail Enterprise Multicloud.

The other thing that we spent a lot of time into is really thinking through how the transition works for most of these enterprises. I mean this is where all the team wears the customer hat, I get to wear the customer hat and try and figure out how this transition happens. Like, many -- in the market, let's say, everything is moving to public clouds tomorrow, the reality is that it's a journey. For most large enterprise, it's going to take time to go through this transition, and it's not one step. As a matter of fact, we believe that it's a 5-step journey for most enterprises. Now everybody is not going to start in step 1. Many of them might be in step 2 or 3 or 4. But there are steps involved in there. And approximately the steps are, you are used to running legacy data center. This is probably 3-tier, probably mostly bare-metal, probably managed by a combination of MMS of some sort or with massive amount of human operation, right? You're trying to move to a simplified data center where instead of this 3-tier, it's a fabric. You actually have telemetry. You have some sort of detection across this operation, but the operation is still probably predominantly manual in many ways. The next step is almost always a multi-domain data center where you are thinking about couple of things, you're thinking about automation, you're thinking about automation of the whole infrastructure, you're thinking about doing overlay, you're thinking about doing overlay because that gives you lot better control on applications as well as multitenancy. So you're looking at overlay. You are looking at, how do I automate threat remediation or infrastructure outages. So you're building more evolved automation in the process, and you have started thinking about public clouds. Like, how do I take advantage of the economics of the public cloud offers, and is there a way for me to leverage that? In this stage, mostly people are still operating islands of infrastructure, right? You may have a slightly evolved multidomain data center, and you have a separate set of infrastructure in public cloud. There are still not one infrastructure for you. Where you want to go is the next step, which is hybrid cloud. You really want end-to-end microsegmentation. You want end-to-end fabric view. You want end-to-end policy, and you want end-to-end root cause insight. This is the beginning of really having a multicloud infrastructure that spans -- that's not confined into each of these spaces, right?

And the last, and in many ways, the holy grail of infrastructure, is the secure and automated multicloud where you've -- where you get to tame this beast, where you have complete visibility across this infrastructure, and you're able to go and manage it in an automated way across the infrastructure. For almost everybody, this is a journey. Some who have started this journey sometimes back, they might be closer to 4. Almost nobody is in 5, because that solution doesn't exist today for someone to go to 5. Most are somewhere between 2 and 3., and what our goal is, is to offer a set of solutions that helps us -- help our customers in each of these steps. For example, if you are in legacy data center, you then buy Contrail Enterprise Multicloud just to build an IP fabric with switches and possibly do EVPN VX-WAN. If you are in the multidomain data center, we give you overlay and start off microsegmentation. If you want to go to 5, which is the complete solution that is described. So the way that we have built Contrail Enterprise Multicloud is, you don't have to use all of it. You get to use the part of it that is relevant to the steps that you are taking in your journey to the multicloud future. And it is very flexible in the way that you can leverage the pieces of the infrastructure or the capabilities that it offers you, but the one common think that you get throughout this is, from day 1, it is intent-driven. Contrail has one of the richest intent language for describing intent. It always had top bound intent and policy of the whole infrastructure. So when you are taking this journey, you are moving to

an intent-driven future where all of your automation is now intent-driven. It's Is not built in the legacy way. So it's really gets you on the path to the end set without having to worry about where my journey is right now. It allows insertion on every point, which is very powerful if you are a CIO.

And with that, the talk that I wanted to leave you with is that what we're building with Contrail Enterprise Multicloud is fundamentally different from what exist in the marketplace. It is not just targeting enclosed Juniper solutions. It is intended to support Juniper hardware as well as our competitors' hardware. It is not intended to just support virtual world. It is -- it will do bare-metal, physical as well as virtual. It is not stopping with VM. It is probably the best implementation of container multitenancy, container networking and container isolation that you can have with very close integration with Kubernetes. It is not looking at public cloud as an effort afterthought. It is building a common infrastructure to cover all the major public clouds and as those close public clouds evolve, we evolve with that. And last but not the least, this infrastructure that we're building is built on top of open source, which is very powerful, because it gives you complete visibility to how the code base works, how isolation works, how the policy evolves, and how you integrate with other solutions. One of the best part that you get with this infrastructure is that all APIs in the data models are open, which basically means that you don't have to pick and choose what other infrastructure that you get to use this infrastructure with. If you have something else that you use for managing or billing or doing business services on top of this infrastructure, it has open west APIs and open data model that is very easily integrate -- integrated with the infrastructure. We are open. We are multi-vendor. We are about and. And we believe it's the most powerful multicloud infrastructure that you can find today in the marketplace.

With that, I'm going to stop and open the floor up for questions. Thank you for listening.

QUESTIONS AND ANSWERS

Operator

(Operator Instructions) Our first question comes from the line of Vijay Bhagavath with Deutsche Bank.

J. Yun - *Deutsche Bank AG, Research Division - Research Associate*

This is actually Brian Yun on for Vijay. So my question was, can you give us a little bit more detail on the capabilities in Contrail Enterprise that are differentiated versus competitors? And then what would be some use cases where an enterprise might select Contrail specifically because of those features?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Yes, absolutely. So in terms of capability, the biggest thing that Contrail Enterprise Multicloud offers is common orchestration for physical and virtual infrastructure. So for example, if you are trying to build an enterprise infrastructure, the things that you deal with are complete life cycle management of your bare-metal servers and your switches and your routers. And typically, they are managed by disparate systems, where you might be managing your bare-metal with some solution. You might be managing your switches with a vendor-provided EMS, right? A classic example would be if you have access to switches, you use CloudVision for managing the switches, right? With Contrail Enterprise Multicloud, all of those functions are built-in into 1 system in Contrail. You can do everything from bare-metal life cycle management to physical switch and router life cycle management. And in those physical switch and router, it is Juniper switches as well as non-Juniper switches with specific vendors that you see in brownfield use cases, right? So that's use case number one. Use case number two is, when you have this bare-metal infrastructure, typically, you are relying on virtualization on both compute and overlay in networking in order to provide multi-tenancy. So this is where you see VMware a lot in enterprise, but you also see things like OpenStack and OpenShift for management of VMs and containers. For networking, there are overlays that people offer. VMware NSX-T would be an example of overlay. Contrail always had a very strong overlay that had multi-implementation support. It always supported VMware, OpenStack, and more and more OpenShift. We have a very tight integration and enhanced networking for Kubernetes for containers. So end to end, as you are trying to orchestrate your virtual environment, whether it's VM or container or overlay, again, Contrail takes over. And that's the single control that you need for orchestrating your VMs or containers or overlay. The third [debate] is, you may

have heard of micro-segmentation, like there are stand-alone products that people sell for micro-segmentation. Contrail already has a very powerful distributed firewall function in -- built-in into what we call vRouter. That's the Contrail overlay agent that runs on your nodes. We leveraged that capability to have a centralized policy that is expressed in the form of your workload or your users. And then we're able to apply this policy across the infrastructure. So again, if you are a CIO, and if you're building a hybrid infrastructure, it might be going from bare-metal to VMs to containers. One of the things that you struggle with is, how do I take my policy in this -- across the board? Bare-metal, the policy was probably on firewalls. VMs, I might have done it with VMware. Containers, I actually don't know, because Kubernetes doesn't offer any native micro-segmentation at all. Contrail gives you a common ability to apply micro-segmentation across this transition. Bare-metal, VMs and containers extends that same capability to public cloud and also the physical firewall. So it's a common policy construct that you get to do. Last bit is, when you're connecting between your on-premise data center and your public cloud, there are options that you have in building some sort of IPSec tunnel. You can stitch things together with what some of the public cloud guys offer and possibly a gateway at your end. With this infrastructure, you don't need to. Contrail automatically detects when you're connecting over public cloud -- over public Internet to public cloud, and it automatically builds IPSec tunnels for you from on-prem to off-prem. So think of this as if essentially solving multiple use cases for which people have used multiple solutions. You might have used ACI or CloudVision for managing your physical switches. You might have done VMware for bare-metal and VM. You might have moved to OpenShift for doing container management, and you have a set of tools that you have built for Amazon APIs, et cetera, right? You don't need to do that anymore. It's actually a single solution that takes care of all these use cases with common sets of intent and policy. Does that make sense?

J. Yun - *Deutsche Bank AG, Research Division - Research Associate*

Yes, that was helpful.

Operator

Our next question comes from the line of Simon Leopold with Raymond James.

Simon Matthew Leopold - *Raymond James & Associates, Inc., Research Division - Research Analyst*

I've got 2 I wanted to ask. The first one is, maybe if you could help us understand the degree of overlap or commonality with Contrail for service providers. And I'm trying to get an understanding in terms of just your R&D efforts of how much could you leverage. And also, just similarity. Is this just a branding issue of using the Contrail name or the degree of similarity? That's my first question. And the second is, getting a better understanding of how you're competing with your largest competitor in this application. Because they argue that their intuitive network is open and multi-vendor, and all the of others say, no, no it isn't. And the argument is that APIs are published, and so anybody can work with published APIs. So I want to get a better understanding of how you stack up in terms of that competitor.

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Yes. Great question, Simon. So I'm going to take the first one. So the solution for telco and enterprise are exactly the same. It's exactly the same code base. As a matter of fact, if you look at what telco cloud deployment use cases are, they're basically identical. You can replace an enterprise data center with a telco data center or a branch with a Telco CO. And more and more, they're in fact using hybrid cloud. So a lot of the solution actually leverages heavily what they have developed for the telcos for the last 5 years. As you probably know, Contrail is the leading SDN solution for telco NFVI and telco cloud. You have more than 40 Tier 1 and Tier 2 telco customers that use it on a daily basis. And as a result, we have not only built features and functions, but more importantly, we have built robustness that comes from having large production deployment. This thing actually scales in a very large production deployment and it's field-tested, right? So we're leveraging all of the knowledge and learning, and the code base is identical. So great question. As a matter of fact, this allows us to leverage this R&D that has gone into this product for the last 4 to 5 years. What we're really doing for enterprise is we are covering a few enterprise-specific corner cases that we did not cover for telco, so it is truly enhancement. But what we also believe is that as telcos move more and more to edge cloud deployment, all of these things that we are doing for

enterprise are directly applicable. So we are cross-leveraging the exact same product. It is not branding. It's the same code base. And as a matter of fact, it's built on the open-source code base that's now Tungsten Fabric. So it's a common code base. But very good question.

Jess Lubert

So we're going to take some questions that came in from the webcast.

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

The second question.

Jess Lubert

Oh, sorry.

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

I'll just answer quickly Simon's second question, and then Jess will jump into those from the webcast. So Simon, the second part was, competitors claim they are open. How are you different? Well, let's take examples. So Cisco ACI, starting from the chip to the hardware to the APIs to the software, it is all proprietary. Try and insert an Arista switch or a Juniper switch or somebody else's -- an HP switch into a Cisco ACI deployment. It just won't work. Your only option is to build a new data center. Tell that to a CIO. I actually hear that every single day like how painful it is for them. And frankly, it actually has, at some point, scaling limitation as well. So it's not really open. Same thing is with Arista CloudVision. Works great with Arista switches. It's actually a good product if all you want to buy is Arista. Try and insert a Cisco or a Juniper in there. Just does not work. So it's not just about API. It's whether it is built to support and manage switches that are from others. When we say we are open, we actually intend to support Cisco and Arista switches ourselves. We intend to stand behind the Cisco and Arista switch support that we'll have in the product. It's not just about open API. It's actually supporting it. Same thing is true with -- we integrate with VMware very closely. We work with OpenStack and OpenShift. We have very close integration with Red Hat, but we also work with other OpenStack and OpenShift-like distribution for container, right? So I hear you. There are degrees of open. But the proof is in the pudding. Are you open source or not? Well, we are open source. None of these other ones are. That's the real big differentiation.

Jess Lubert

Moving on to the questions coming in from the webcast. The first one we have is from Ray Mota of ACG Research. How is Contrail's software licensed? And what steps are required to integrate it into existing infrastructure?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

So we have always had a license model for Contrail. It has been various models, including with number of endpoints, et cetera. That model is constantly evolving. Going forward, as we see these as turning into a solution where we are not necessarily just selling overlay, in many, many cases, actually, we are selling this as an orchestration for the underlay. Obviously, the model for the solution practically evolves, and we're constantly looking at this as we evolve the solution.

Jess Lubert

So next question comes from Alan Weckel of 650 Research Group. In a multi-vendor and multicloud environment, how does the customer relationship change in terms of network planning and product monetization?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Yes. That's actually a great question. So one of the things that we expect to be a key part of this transformation for customers is moving from the traditional system integration model to moving into a diverse model. It is necessary, because you are dealing with a set of software tools that are agile, that move a lot more frequently, and it's built for automation. Now the reality of that, many of our customers are not yet ready in their journey for the evolved model, and we view that as an opportunity for Juniper. As a matter fact, we are seeing opportunities already for doing build, operate and transfer for customers. So in some ways, it has implications on our services business as this business matures. But it's still early days. So we are constantly refining our model as to how we also help on this diverse journey for our customers.

Jess Lubert

Next question. Can you talk about the addressable market Contrail Enterprise Multicloud addresses and the pull-through it may have on some of your other products?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Yes. We have looked into the account very closely. So there are 3 sets of market that this product is designed to address, and we are seeing customers traction on all the segments. One is just bare-metal management, whether it's bare-metal server or bare-metal switches. I mean, this is the market where Cisco ACI or Arista CloudVision does it. The second market is virtualized infrastructure, whether it's VMs or containers or overlays. This is -- this has been predominantly VMware for the longest period of time. But also, there are some smaller players that play in this space. The third one is end-to-end connectivity and security. It's often called micro-segmentation like things, but it's really end-to-end security, where, again, there are some start-ups, and there are some established player that play in. All of this market is addressable by the product that we're building in. So all in, it amounts to about $10 billion TAM. It's not necessary that we are going to address every segments of that on day 1. But the product is designed to address this whole $10 billion TAM. That is on top of what we currently said. And of course, that includes our hardware solution sale as well our software solution sale. We are really looking at this as a solution TAM that we can address.

Jess Lubert

Next question is, what elements of Contrail Enterprise Multicloud are available today? And when can we expect to see the full solution on the market?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

We just released the first version of Contrail Enterprise Multicloud to our alpha and beta customers this month, and we have some very early adopters who were testing this out in their deployment. We believe the first GA version of Contrail Enterprise Multicloud that allows both brownfield and greenfield deployments in early second half of this year, and then there are multiple launches that are planned every quarter with enhancements after that.

Jess Lubert

The next question, discuss how you plan to go to market with Contrail Enterprise Multicloud. And do you believe you have the right sales force and knowledge needed to sell this solution? Does selling this solution require incremental investment?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

We, obviously, sell to enterprises. We actually have a healthy and growing enterprise business. We have been selling switches and security to enterprises for 4 years now. So obviously, we have an enterprise sales force. But as we said at the beginning, as this solution evolves, the channel and the partnership model, obviously, has to evolve for all of us. And you have seen some of those coming out of us in our partnership with Red Hat as an example. So it's going to be an evolution just as it's an evolution of the product itself, but we are putting a lot of effort into that evolution as we speak.

Jess Lubert

Next question. How does Contrail Enterprise Multicloud inter-operate with other third-party solutions like application delivery controllers and firewalls? And is there an incentive to use Juniper security? And can you work with third-party server security solutions?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Yes, great question. I'll go back to what I was saying before to one of Simon's question of lessons learned of using Contrail as an NFVI infrastructure for telcos. It has been multi-vendor for a long period of time because it was necessary for the product. So Contrail, for example, already supports multiple firewalls, including firewalls from our direct competitors (inaudible) deployments, so that doesn't change. Contrail has already supported multiple virtual applications in, for example, the mobile networking use cases. So it is really designed to support applications that are from multiple suppliers, including direct Juniper competitions. It also has a very rich application management framework. At the same time, we fully expect that for evolved enterprise use cases, there are going to be other orchestrator or a BSS system that will sit on top of this -- of Contrail. And as a result, we have actually built this with completely open risk API and data model. And we have done some of those integration with some of our very large customers already. In many cases, it is their homegrown system that has integrated with Contrail Multicloud. But we absolutely expect that to remain the case going forward.

Jess Lubert

Next question. Discuss to what extent Contrail Enterprise Multicloud is likely to accelerate the company's efforts to capture more recurring software revenue by making it easier to manage and insert new solutions into enterprise environment.

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Yes. I mean, clearly, there are 2 things that happens with this solution. The one thing is, we get to attach software with the hardware that we sell to our customers. And that is absolutely the goal. And obviously, that is going to have a positive impact on our margin to -- with the software sale. At the same time, we also see use cases, where this is going to be a pure software sale. That's also great in the mix. So going forward, we expect that we are going to see changes in the mix that we have in software versus hardware. And depending on how quickly this ramps up, we're going to see different mix that will evolve out of that. But yes, we expect both combined solution sales of this, software plus hardware. And we also expect pure solution -- pure software sale coming out of this.

Jess Lubert

So next question. Discuss the service opportunity associated with Contrail Enterprise Multicloud. And is it right to assume there will be a lot of upfront professional services before you see the software revenue?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

As I mentioned in my Tech Talk that move to this multicloud is a journey for most. It's 5 step. We've simplified this journey a bit, but for a reason. Because depending on, as an Enterprise where we -- where you are, you are going to rely on some degree of diverse help from outside or not. Like there are enterprises for sure who are well ahead in this journey, who definitely have a diverse model internally, right? And for them, this is really a solution and they know how to integrate. But there are many where they're just starting on their diverse journey, right? And they are going to rely on companies like ourselves, and it's not just us. I mean, it could be others who are offering this capability of building the systems for them. We definitely see that opportunity ahead of us. We actually do have customers where we do professional service work for turning up the cloud for them. And I would say, it's little too early to speculate how big or little this business is going to be. But it's definitely an opportunity that we're going after.

Jess Lubert

Next question. How does Juniper support multi-internet connections like DSL, cable, fiber and LTE at the customer premise? Do Contrail products support this? Can I direct traffic across any ISP service I want?

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Yes. As you may be aware, we have announced Contrail SD-WAN, in fact, in the recent past. And there are some pretty large deployments of Contrail SD-WAN, specifically with Vodafone VPN Plus, that's actually best on Contrail SD-WAN solution. It is designed to solve the exact brand's use case that was mentioned in this question. And again, our view here is that each of those by themselves do not form a product. It's a solution set that the CIO is looking for. We have never viewed multi-internet connectivity/SD-WAN as a stand-alone product. We viewed that as an important feature for the solution set that the CIOs are looking for. And even there, we have one of the most complete portfolio because there, with SD-WAN, we also offer the same security fabric that we have here, right? So it's not just connectivity, but it's also secured connectivity, end-to-end.

Jess Lubert

Thank you all for your questions. That will conclude today's call. If you have any follow-up, please reach out to me either via e-mail or phone.

Bikash Koley - *Juniper Networks, Inc. - Executive VP & CTO*

Thanks, everyone.

Operator

Ladies and gentlemen, this does conclude today's teleconference. Thank you for your participation. You may disconnect your lines at this time and have a wonderful day.
