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*Debate Session VI:
Goodbye Earth! What's the future for hardware vendors in
a virtual universe?*

Chair: Pim Bilderbeek

Analyst, The METISFiles

Panellists:

Gary Bolton	Vice President Global Marketing, Adtran
Phil Tilley	Senior Product Marketing Director NFV and CloudBand Solutions, Nokia
Ian Keene	Vice President, Gartner

Manek Dubash

As you are probably aware, Pim was a musician for 12 years before he joined IDC and then METISFiles, so that's why I played a bit of U2. I knew he would appreciate that. He supported U2 actually when he was a professional musician.

Pim Bilderbeek

The next session is about the future for hardware: Goodbye Earth! What's the future for hardware vendors? I'm Pim Bilderbeek. I'm from the METISFiles and we're a three-analyst outfit from Amsterdam in the Netherlands. We look at cloud, software, and the cloud economy.

I will introduce the panel later on, but I'm sure their faces look familiar to you. They should do to me. I've seen them around this morning.

To set the scene for the future of the hardware vendors in the virtual universe I'd like to talk about a couple of systems infrastructure trends from the past to where we are going now. Straightaway I will say when I talk about hardware I would just like to

narrow it down to systems infrastructure because if you take hardware in a broad sense, you could argue that any IoT piece would be a bit of hardware, but we're going to stick to servers, storage, networking and perhaps some security appliances. So let's narrow it down a little bit for the sake of the conversation.

What we've seen over the past 30 years that I've been in the industry, we've seen systems infrastructure being built on-premise in a scheduled way. It took time to do it. It was physical. You had to have manual labour to install all that. It was on-premise. We had branded hardware and it was built from point products. So servers, storage, networking, and the solution with software on top of it.

That's changing. Today I think we're in a kind of hybrid world where we're moving from the old world into what we call I guess cloud computing, public cloud computing, and the public cloud-computing world is very different. It's on demand. So no longer do we install servers manually, but we like to have our capacity get to us straightaway as a service.

It's virtual. Enterprises don't like buying physical stuff anymore because as soon as you buy a server or something else hardware it depreciates in value and when you buy something as a service, the service continues and the service provider will upgrade the hardware for you.

It's automated. Like I said, it took weeks, months previously to get your systems infrastructure together and working. It's still the case with networking services as we discussed earlier. It takes a lot of time to get networking services to enterprises while in reality they want to have it very quickly.

We see a shift from owning systems infrastructure to getting public infrastructure as a service from the likes of Amazon. But also other types of infrastructure as a service are getting more popular, more managed types. Amazon is very much a self-service type, but there are much more managed services around. Infrastructure as a service as well.

We see a move from branded to non-branded. It would be interesting to hear the view from the panel what they think the value of branded hardware will be in the future. You know, we used to buy server, storage, etc. brands and put them all together, but I think we're moving to a world where the brand might be actually the software orchestration and underneath perhaps we have white boxes. We'll see. We'll discuss that.

And last but not least I think anyone who calls himself a systems infrastructure vendor is no longer selling point products, but really an integrated portfolio of systems because everything has to work together. The server has to work with the storage, with the networking, and the ultimate products surrounding that, of course, are the hyper-convergence systems that we see these days where you buy everything that you had previously in point products in a box which might be a box containing white labelled hardware, but the brand of the integrated box is the brand that carries the value. Not the separate systems. It's actually the whole working together of the brand that is the value.

So this is the world we're going to, to an on demand virtual world. I think we're in a transition phase now which we call hybrid IT.

I didn't hear a lot of talk about hybrid IT actually, although I think a lot of enterprises are very interested because they have to manage both worlds for a considerable amount of time I think. So helping enterprises understand how to get from here to there and live through that hybrid world is going to be very important for vendors.

My take on all this and my view on hardware and me being a musician at heart, if I took a quote from a very famous musician he would have said, "Hardware isn't dead, it just smells funny". Anybody know who said that? Frank Zappa actually. Frank Zappa. The quote actually was, "Jazz isn't dead, it just smells funny".

Pim Bilderbeek

So my position is, you know, okay, hardware, it's not dead yet. I think there is a lot of life in hardware, but things have changed. It's not the same hardware that it was previously.

To discuss this point with me we have the panel here. From the right to the left we have Ian Keene from Gartner. We have Phil Tilley from Nokia and Gary Bolton from Adtran.

I would like to start with a big question I guess. If all enterprises are going to buy infrastructure as a service, are we going to still see systems infrastructure selling to enterprises, or is everybody going to sell hardware to service providers? And, by the way, service providers, are you still selling the hardware they need, or are they in reality buying white label products and building their own products? As a matter of fact, where is the hardware market going? Is there still an enterprise hardware market going forward do you think? Is everything being bought by service providers, or as an ultimate threat, are service providers going to build their own stuff? Gary, maybe you want to start with addressing that. What's your point of view on that one?

Gary Bolton

Sure. Adtran has been around for 30 years and we started as a hard-core hardware company developing our own ASICs and cards. But about seven years ago we made a big transition to go from a waterfall process to agile processes and today our 803 engineers, about 82% are working on software products and embedded designs.

So, are we looking at the market as hardware is dead? Absolutely not. But we are focusing on the value and the differentiation. So, when you think about white boxes, so if you look at kind of the continuum of service providers, so like AT&T for example, they have their core architecture, the central office really redefined as a datacentre and so they look at everything on how do we go to white boxes and to high volume merchant silicon. So they are definitely on the page of everything is a commodity and they can source that themselves. So get things from Taiwan and so forth.

That's not going to happen overnight. What we're seeing is that the focus is really on what's the differentiation. So what we're focused on is what are the things that we really provide as value over a white box? So if you're doing a switch, a router, a server, that's pretty easy just to do. You know, have that as a white box. But if you're doing some highly specialised products like for instance a G.fast which has been deployed, or is starting to get deployed in Europe and other places in a big way, that needs to be in a hermetically sealed small unit that's reverse powered and then you have to have different tuneable optics and things like that. So there are some things that you need to be able to do that are highly specialised that's quite different than a switch router or a server.

So our focus is on leveraging our domain expertise and then how do we leverage high volume merchant silicon in combination with what we call Orca and that's basic taking FPJs and things to be able to provide some flexibility and programmability so that you can be able to differentiate as a service provider in this market.

I think that there is definitely a shift and, as I said, you know, our company, our mindset, the way we operate has shifted. Back in the day when we were hardware guys we did about two release cycles a year. Now we develop in two-week increments. We've reorganised our whole company. Instead of having a carrier division, enterprise division, we're functional. So we focus on having all our R&D, whether it's enterprise solutions or broadband solutions, so we want to be able to build on open source and be able to not have parallel designs. We would have design efficiencies.

Pim Bilderbeek

So you're saying we're more of a software company now? You're selling specialised equipment.

Gary Bolton

Yes.

Pim Bilderbeek

It's the other guys, the Nokias, which are under threat because they sell the server, the software and the network? They do generic stuff and they're worried?

Gary Bolton

Well, we're moving to an open environment. So since then we were based on open source and that we will be building to yang models and be able to be managed with that (inaudible). So it allows us to mix and match with the Nokia network or a Huawei network. So you will see that it's not this whole locked network that you see in the past so it provides a lot of opportunities for service providers to move quicker and to be able to get what they want and not be stuck with any particular vendor.

Pim Bilderbeek

Okay. Phil.

Phil Tilley

Well, yes I mean so people perceive I guess Nokia as being a hardware company. The reality is we're actually a software company. 70% to 80% of our development funding goes into software development. Has done, always has done. So we're actually been a very smart software development company. It just so happens that historically we've realised the revenue of that software through hardware and typically that hardware sale has been through ports. It's number of ports or number of chassis size or whatever. I think where we see the shift now is obviously as we go towards X86 server-based hardware and sort of a fairly common standard architecture for a lot of the enabling capability for our software, the licensing model shifts. So it's actually now based on core server and that sort of thing. So we have to realise the revenue from our software changes. But fundamentally, it's still we're a software company.

Then when you look at that, it actually says okay, well it actually doesn't really matter. It matters a lot less whether you design and develop your own hardware or you actually bring in hardware. There is a cost in that hardware. The question is whether you bring in a white label product and add your software and integrate your software into that white label product or you build both right from the silicon level, so you sort of build your own silicon, or you actually bring in merchant silicon and put the hardware around that.

So, again, as to Gary's point, is actually every part of the network is slightly different. It has different demands, whether it's the G.fast access point, or in our case, the cloud RAM part. We know that in the cloud RAM, as the RAM moves towards cloud architecture, there are some performance scaling challenges and issues where we see that we still may use X86 chipsets Intel based, but we'll actually optimise that for that RAM part through the IO port chips around it. So we'll sort of create, based on an open compute platform type architecture, we'll create our own hardware.

Pim Bilderbeek

You will use that as a hardware USP to sell your hardware against the other guys?

Phil Tilley

Our USP becomes actually our integration capability. The fact again, and I think this is as a software supplier or sort of manufacturer and developer is, and also I think as Gary said, is as we build this software a lot more of the software that we use starts coming from open source. So we start bringing in an awful lot of open source, testing, validating and building around it and generating potentially contributing some open source or selling it as our own open source depends on the application and usage. But it's that integration, the test and validation, that becomes a real differentiator for us.

Understanding how it's going to be applied, where it's going to be applied, and what are the components it has to interface into.

Pim Bilderbeek

Ian, what's Gartner's view? Is hardware dead, or is there still life left and by the way, who is more under threat Nokia or Adtran? What should be more worried, Nokia or Adtran?

Ian Keene

I don't think they should be worried either of them to be honest. I think as Jerry mentioned in the last presentation where they've been doing surveys of communication service providers, their CTOs and what's the benefit of SDN. I remember a number of service providers. In fact, in one NetEvents I sat down and had a chat with a guy from Deutsche Telekom who was saying it thought it was a wonderful opportunity to really cut costs in networking products and how they're going to save all this money and Alcatel Lucent, Nokia, Cisco, they're going to die and of course it hasn't happened. You're right in saying now you ask service providers where do you see the greatest benefit out of SDN, it's new products and services. They know it's going to cost.

In fact is SDN going to reduce the budget that service providers spend on networking equipment, whether that's software or hardware, the answer is no. It's going to cost them money and it's going to cost them money in OpEx too. As we, in my panel discussion, that transformation everyone agrees is going to take quite a time. So, in the meantime you have to support the old and the new.

I mean look how the PSTN has hung about for so long. It's still actually the only way to make a decent quality phone call. So these things are going to take some time to change.

We're seeing what we coined, I think yes it was us that coined the phrase, we're not going to see too much white boxes. We're going to see bright boxes. That's branded X86 stuff. But it is generally I think most people who buy the equipment, that could be an enterprise buying enterprise LAN networking equipment from Cisco. It could be a service provider buying networking infrastructure from Huawei or Nokia or Adtran. They need people who they can trust that knows how to build a network and that network is going to operate. So, are they going to go and buy a white box from Taiwan and trust their network on that? Generally what we find is the answer is no.

Pim Bilderbeek

But Facebook does.

Ian Keene

Yes, I know Facebook does, yes. But Facebook doesn't operate a network. They provide services. It's a different thing.

Phil Tilley

And there is an awful lot of development. I mean one of the analogies that I sort of use is I think everybody is familiar with Ikea. Who has gone and bought Ikea furniture? And who has opened the manual out of the Ikea box and read it? And who has built an Ikea furniture and got halfway through and realised the left is on the right and the right is on the left? The reality is I think if you look at Ikea, I mean ready to assemble furniture, which is much like NFV with multiple component parts all coming together that has to be put together, you need a manual. But actually, it's not just having the manual. It's actually having the experience of done it and integrated it together to make sure you get it right.

When we look at NFV where we've got all these things, component parts, and I think a white label product being one of those component parts, if that's the first time you've seen it, you're going to probably get it wrong unless you're working with somebody who has actually done some integration around it, put some open source software onto it, tested and validated it. You need to know and understand when you get that white label product there has got to be a process to test, validate and check performances because not every white label product is the same. So there is a validation phase. Then, as you say, there is the integration test phase, the manual that you have to bring to how do those components bring together.

So I think white label is great. It does reduce one part of the cost. But actually, the cost then has to shift towards extra testing, extra validation, the writing of a better manual to bring it all together.

I mean where it's all brought together as one hardware solution, that testing has been done typically by the vendor before he shipped it.

Gary Bolton

Actually, I don't know if I agree with that so much because the guys in Taiwan can do amazing things and they're not just doing the first Ikea piece of furniture. They're doing millions and millions and millions. So they might screw up at the beginning.

If you look at modems and DSL or other technologies, fibre to the home, we don't care about high volume O&Ts or modems and things like that. Let Taiwan make all those they want. We can get out of that business because these things are so price sensitive there is no margin in it and we need to be high volumes to be able to get more head imports out there. So we welcome white boxes and the commodity stuff, but it's the tricky stuff. So I think the part I do agree with Phil is the thing that takes domain expertise, the things that our company and Nokia's company that have domain knowledge that no one else would have from lots of engineering time, lots of times in forums, lots of times in standards. So all the things that we've been doing missionary work, those give us a unique perspective that we can do the tricky things and that's where the high value is and that's where the people are willing to pay.

Now, the challenge is how they're going to pay and as Phil says, it was real easy before. Here's a box and all the value from all the innovations and the patterns and all the standards activities and all the working on the network and the consulting and

stuff all got monetised in the sale of this piece of gear. They want the gear for free and so now how do you monetise that in a different way? So that's kind of what we're seeing is the flip on how do you change from giving software away for free to give hardware away for free and then monetise the software.

So if I look at our enterprise business, we've already seen that. We have 4,200 dealers that resell our enterprise gear. In the past they would be selling routers and switches and gateways and access points and so they would be selling boxes. Today they don't do that anymore. Today they come and say, "We're selling Wi-Fi as a service. We're selling everything as a service" and so they don't want to buy a box from us. They want us to sell them a monthly recurring price because that's what they're selling their customer. So they're building how do I build this very predictable high visibility monthly recurring services? So I think that's the way that we're going to see our customers going forward.

Pim Bilderbeek

That's hardware as a service?

Gary Bolton

Well not so much hardware, but our services business in the US went up 60% in the past year and we're going to see that continue to grow because in the US there is something called Connect America Fund which is \$9b for broadband stuff. These service providers, it's a bubble. They don't want to hire tons of guys. They don't know how to do the network planning. They don't know how to do the installation, maintenance, all that stuff so they come to us and say, "Hey, can you do all this stuff for us?" So the fact that we can provide value to them and the stuff that we used to give them for free, they're willing to pay for now. So it's a monetising net service.

Pim Bilderbeek

Right. Right, right, right, which brings me to another topic which is, in the old world we had lots of resellers reselling for us who had integration revenue from putting all the services, software and networking together. Now you were saying, and I guess you were saying as well Phil, that you're kind of taking back that revenue and are becoming, can I coin the phrase, a value-added vendor?

Phil Tilley

I mean I'm not sure. I think it depends on different markets, different product sets depends on where we would see that. I mean there is absolutely still a space for those integrators in a number of scenarios. I know my focus of the business is more selling to service providers, so that's where I focus and understand more. That's where I see us being asked by the service provider to do the integration.

But I think if I look at our SD-WAN business with Nuage Networks where we've sort of gone into the enterprise there, then again where we see resellers and channel partners doing quite a lot, more of the integration there. I think one of the interesting

things, and picking up on Gary's point there, is on the white label product is one trend that we have to do in that space is we're being forced to make the option of supporting multiple hardware options. So previously we would have said, "It's this size, shape and form". I think where it is different is either the integrator of the service provider wants the option to buy the hardware separately to the software.

Interestingly there is some mixed feedback from service providers as to which one wants to buy and source their own hardware and which ones don't. There are some extra costs. Where they may go and buy the hardware themselves, the cost shifts somewhere else.

Pim Bilderbeek

You were talking about enterprises still buying networking and hardware and servers and storage. But isn't it true that more and more enterprises just buy servers or infrastructure as a service. Isn't it true then that your market for addressing that opportunity is decreasing and it's just going away, it's never coming back, or how do you see that?

Phil Tilley

Actually, the SD-WAN in particular is one of those where the service providers are taking their time to get into offer a new SD-WAN enabled VPN because of the time it takes for them to do the integration into their OSS and all the orchestration. So what's actually happening, especially the larger banks and financial communities, is they see they can go and buy the SD-WAN equipment. It brings all the solace of policy enforcement stuff and lots of benefits of faster VPN deployment and they will go and build that as an overlay. So we're seeing actually still the enterprises buying that SD-WAN solution.

Pim Bilderbeek

So they would buy it as an orchestration service or they would want to orchestrate themselves?

Phil Tilley

They will manage. Within their domain they can manage and orchestrate it with a fairly simple resource domain manager or the SDN controller. But obviously that's a single enterprise and a single sort of deployment case. The service provider, when he has to take it and offer that same service, he's got to support X many hundred enterprise, therefore he has a more complex orchestration system he has to manage.

Pim Bilderbeek

But the hardware they orchestrate, they might not even own then, or what?

Phil Tilley

Well, actually, yes. I mean right now the enterprises, the large enterprises are still going and buying that SD-WAN as an overlay solution. So they are buying the hardware.

Pim Bilderbeek

I understand that. They use that or orchestrate servers and storage and networking.

Phil Tilley

Absolutely yes. Yes.

Pim Bilderbeek

Are you saying they also own the networking that they orchestrate?

Phil Tilley

Yes. They're owning effectively the customer premise equipment and doing it as their own.

Pim Bilderbeek

They're not going to get away from customer premise equipment ever?

Phil Tilley

Absolutely. The only difference is it is much more versatile and much more flexible. You've not got an acceleration appliance, a firewall appliance. You've got much more in one single appliance which is supporting multiple virtual machines, multiple functions and so it is a more standard common hardware that is more multi-functional, but it's still there.

Gary Bolton

I think you've got to look at this as, and it doesn't matter what industry you're talking about, it's really driving efficiency. So while this is a beautiful hotel, Airbnb's market cap is about \$25b, they have zero hotels. Uber has zero cars. So if you look at the market cap of the Marriott Hotels and Starwoods combined don't add up to what Airbnb is and so it's really about do you need to build the infrastructure here, the CapEx, to have a place for people to stay, or do you need to drive the efficiencies up. In Rome there is all kinds of empty rooms all over the place and why not be able to connect consumers so that people that need a place to stay with the capacity and people who have places to stay. So I think that's the same thing that we're seeing in network. But I think you'll see that across every industry. It's just a way to be able to drive that efficiency. But the difference is where does differentiation matter and how do you drive that differentiation?

Pim Bilderbeek

You guys are all fairly positive about enterprise I guess. Wouldn't they just go to say Level3 and get all their networking needs from them or Verizon?

Ian Keene

Not all of it. Some of it. I think some of it. I think the average enterprise is going to be doing stuff in-house for the foreseeable future. It's just they won't be doing everything in-house. So, you talked about hybrid approach. Yes, sort of don't do the stuff that isn't mission critical to you that is lower cost and easier to outsource. But it doesn't mean the whole IT. I mean outsource all of your IT, all of your networking capability? I don't speak to enterprises that are planning on doing that in the near future.

Pim Bilderbeek

Isn't it the case that business managers are now more in charge of buying solutions and if IT says to them it takes long to build it, they'll go somewhere else and buy it as a service?

Ian Keene

I think their main concern is to make sure the IT systems and communication works. That is increasingly important.

Gary Bolton

And secure.

Pim Bilderbeek

That's the IT concern?

Ian Keene

Yes. Yes. So there is a risk factor that comes into this too. Can they go out and trust a service provider to that degree so they can put essentially the future of their business, whatever business that might be, in the hands of a communication service provider and I think the answer is no.

Phil Tilley

And it's not just actually the providing the service. It's actually what happens when something goes wrong? The support process behind that IT service is absolutely critical. I think the question is does the service provider offer the same level of customer care, customer support that you expect from an IT organisation?

Pim Bilderbeek

Going back to Ikea, if something goes wrong you go to Ikea, right.

Phil Tilley

Yes, but isn't it nice to actually have something that works in the first place and not have to go back?

Ian Keene

No and remember in most service provider contracts there are like generally three to five year deals quite typically. But the IT strategy of an enterprise is longer term than that. We're going to see a mixture of the things and I don't think it's going to go away. You're still going to be making ASICs and stuff and it's not going to be all on a central server. Intelligence is going to be distributed. It's not going to be all centralised in one incredibly huge data warehouse. So yes, we're moving towards more flexibility I think and more agility, but we're not completely moving to boxes.

Pim Bilderbeek

So hardware isn't dead. It doesn't even smell funny, right?

Phil Tilley

It smells different, for sure. Or actually, no. I think actually that's probably wrong. The hardware is probably very similar, but actually, the go to market approach for that hardware will be different. The revenue realisation on that hardware may be different, but fundamentally, hardware itself you still need a processor, you still need memory, you still need. That's very much the same.

Gary Bolton

Well, at the end of the day this is a major market pivot. One of the things that I like to say with my staff is, "If you do the right thing too long you're going to go out of business". So anybody who is trying to do what they did yesterday is not going to be around tomorrow. So we are definitely, at our company, changing our culture, changing the way we operate, changing how we monetise the value we bring and so that is definitely evolving at a very rapid pace. But as long as you can do that and you are aware of that, then you'll be fine.

Pim Bilderbeek

Okay. I would like to get a sense of what the audience is thinking. Is anybody thinking hardware is dead? Anybody?

Any questions from the audience?

From the floor

On your comment of hardware is dead, I think it is just going the other way round. There are people returning from the cloud, right. Dropbox has returned to its own infrastructure and is only using its overhead on certain areas on the Amazon cloud. So there is a return basically.

As a start-up you start in the Amazon cloud. You have to be mad not to do it. But after a while, when you have fixed resources and fixed customers it might be very interesting to return to your own infrastructure. So, it's both ways. It's a more complex story than hardware is dead, Pim.

Phil Tilley

Yes, I mean it's a good point. You need the flexibility right. You can buy anything as a service, but it's not necessarily the cheapest way to do something. But if you've got a predictable run rate level of business, you can actually build to that line of business and you know that and then the anything as a service gives you the flexibility. That's exactly that model.

From the floor

Yes, I want to follow-up on that actually. I was at an enterprise event last week and actually there was a speaker from Airbnb and they're moving away from full cloud to hybrid cloud and on-prem. There was someone from Bloomberg who is going back to on-prem for their communications services. I'm curious here as to whilst things might get virtualised, is it going to be virtualised in the service provider cloud or in the on-premise at enterprises?

Phil Tilley

Yes, that's where we talk about thick and thin CPE where again a thick CPE may be that CPE that is multi-functional with multi-virtual machines that you can spin up multiple machines, multiple virtual functions on and a thin CPE is where actually we bring all that functionality back so you have a very thin simple CPE backhaul into the virtual functions in the core.

From the floor

Linked to that, one of the criticisms was that a lot of cloud implementations are hard to customise, which is obviously not an issue for small business, but large enterprises want things integrated with their apps and done their way. Do we see that type of capability?

Phil Tilley

Again, I think this is where SDN has a huge part to play because actually now the linking of those virtual machines, no matter where that virtual machine is which obviously the virtual machine hosting the virtual function, the linking and the networking as a service chain between those is taken care of through the SDN element as a controller which is centralised. Then you have a single API point of integration into that controlled. So I think that's exactly where SDN really does play out.

Gary Bolton

I have to agree with Phil on that. On our network virtualised functions we don't care where they reside. They can reside on a device. They can reside in hybrid or public

cloud. It doesn't matter. It's really being able to leverage open source to be able to link these things together and how they are all orchestrated. So public, private, hybrid it doesn't really matter.

Pim Bilderbeek

Any more questions?

From the floor

Yes, Phil, I just want to qualify that SDN controller. Is that actually hardware?

Phil Tilley

No. No, it's software. It's a software running on a hardware. So it's another virtual function running on it.

From the floor

I think the answer is yes.

Phil Tilley

Well, no.

From the floor

It's actually the first time HP pitched SDN to me, they said, "Oh, yes, we're going down the open flow route. It's going to be all open, blah, blah, open source and it's software, software, software and then that is controlled by the open flow controller" and up comes a picture of very large piece of hardware at the moment. There you go.

Phil Tilley

It's software running on hardware. The difference is I don't care whose hardware it is, it's my software.

From the floor

I mean back in the 1990s, every time someone had a Cisco or Well Fleet retro upgrade it was actually a software upgrade, not a hardware upgrade, so what's new?

Phil Tilley

Well Fleet, now that's the company.

Pim Bilderbeek

Okay, no more questions. I think we deserve a round of applause for the panel.

Manek Dubash

I think you do.

[End]