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Datacentre transformation and the Cloud

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Cloud Computing is popularly understood from the user perspective, meaning software as a service provided over the Internet and not hosted on the user's own infrastructure. As such the user pays only for the actual usage and can avoid unnecessary capital expenditure.
But the principle can also apply to a large enterprise that chooses to create its own cloud by consolidating resources into a datacentre accessible across the corporate WAN and then extending access across the Internet to serve its mobile workforce, partners or customers. Whether the datacentre is consolidated physically or virtually becomes less of an issue than the relationship between the corporate WAN and the wider Internet availability. When providing services such as social networking, search engines, auction sites etc, the entire business moves into the cloud...

Michael Howard, Principal Analyst and Co-Founder, Infonetics Research

Telecommunications service providers, equipment vendors, software houses, systems integrators and start-ups are all exploring or actively entering this cloud-space. Traditional players, including IBM, Microsoft and Oracle have either announced or a formulating their own plans to ensure that their application deployment platforms also gain a foothold in the cloud.
It is not only the vendor landscape that is changing, business models are shifting too. Software-as-a-Service (SaaS) vendors who for a long time have been running off their own infrastructure now face tremendous challenges against new entrants on the Internet, with the benefit of a freely available infrastructure as well as the potential to tap that broad user base for application testing and development.
Michael Howard will give a summary of the latest developments, new entrants and the challenges they present, and provide the latest research data on enterprises' expectations for cloud computing – where the opportunities are and how best vendors can address them.

Panellists: Steve Broadhead, Founder & Director, Broadband Testing; Peter Martin, Head of Strategy for Cloud Computing, Orange; Andreas Stern, Director, Business Development Director, Spirent Communications

Manek Dubash
Gentlemen, well after a sales pitch like that how could you fail to come to the next event and if you do want to come to the next event, see the big chap at the back.
Right, we have a fascinating agenda for you this afternoon. But before I get into that, and I shan't be holding you up very long, just wanted to say that we do have some shuttles, transfers to the airport happening this afternoon. There will be a list out there somewhere. One of our good people will show you what it is, but there is basically shuttles at 3.15, 4.20 and 5.30. So whenever your flight is, you're booked into the right one I suspect, but just best double check with the people out there and we will finish on time this afternoon to make sure that you don't miss your plane home or wherever it is you need to go.
I might also mention as well that I know that the hotel does organise shuttles if you're staying on for the Mobile World Congress. The hotel does organise shuttles that drop you somewhere in the middle of Barcelona and to get onto one of those, have a word with the concierge of the hotel downstairs.
Okay, so onto this afternoon's agenda. First we will be talking about data transformation and the cloud, we'll be talking about what green IT means for the enterprise and we'll be talking about 40/100gb Ethernet. Well, which one will win? Well that kind of depends who you ask doesn't it? Then finally, I'll be rounding up our analysts who make all these wonderful predictions and I'll be grilling them a little bit about just how they arrive at some of these predictions and asking them to perhaps be a little bit more transparent about how they do so. It should be interesting. Do stick around.
Okay, without ado, can I ask the first panel to come down chaired by Michael Howard and his panel. Thank you very much. Datacentre transformation.

Michael Howard
So as an industry researcher we survey providers and enterprises all the time and I need to take a poll here of the audience to start the afternoon. So how many service providers are in the room? Great. And how many product manufacturers are in the room? Ah ha and how many analysts and press are in the room? NetEvents is the only event I go to where these hands outnumber manufacturers, service providers etc, so that's good. We're happy, all contingents are here.
One other question, it is Europe after lunch, maybe I ask this question at 4 o'clock, but how many of you are awake. A full two-thirds. We're doing fine.
So I wasn't here yesterday, so I don't know who has been introduced or not. But Steve Broadhead is a Founder and Director of Broadband Testing.

Steve Broadhead
Yes, as I explained yesterday, so we do product testing. I should also mention we've got mobile test labs now, which is focusing on mobile handsets and mobile data applications etc.

Michael Howard
Thank you. Welcome and now Peter Martin is the Head of Strategy for Cloud Computing at Orange.

Peter Martin
Yes, I'm one of the three service providers here. Orange Business Services really offers IP networking and computing services, very wide variety often bespoke to medium to large enterprises across the globe.

Michael Howard
Great. Thank you. Welcome and Andreas Stern who is the Director of Business Development at Spirent Communications.

Andreas Stern
Yes, David Hill was on a panel yesterday already, so he introduced our company already. We are a test and measurement company focusing on all kinds of communication testing.

Michael Howard
Great. So I have a 45 minute slide presentation that I would like to give. I'm going to try to give it in three minutes though. I really only want to set the scene for what's been happening so that we can talk about it and let me say that I was asked to fill in this panel slot. Infonetics is developing our datacentre coverage area, but we don't have it yet. So I did borrow some really good background thinking from Atlas. It's a US research and university type development, but they are known around the world for figuring out what kind of traffic is going on and what kind of changes are going on in the Internet. So they have this Internet observatory. It has spots all over the world.
Basically, the changes that are bringing about cloud computing and the move to why is datacentre all of a sudden so important is that this is a classic, until three years ago, the Internet looked like all the big carriers in the world were the Internet backbone and then there were regional nabs and then regional access and then ISPs and other competitive carriers. Very structured. Big guys in the lead and so all the traffic, really level three, the carriers carry a global crossing scene. AT&T, Spirent, NTT, so all the big guys are right there on the list of having the largest, the most number of interconnections and traffic.
But, the world has been changing. Basically, if we look here, the collapse of price of wholesale transit and I'll show you that in the next slide. So the cost of, the price of selling Internet transit service is going down. The growth of advertising, Google etc, revenues have been going up there and the collapse of the price of cloud hosting, content delivery networks and a scarcity of datacentre capacity. What does this all mean?
Here's a measure. Revenue from Internet transit going down. Revenue from advertising on the Internet going up. So that in 2009 what happened, now, so here's that same list of top providers in 2007 and here is the list today. Level three global crossing, oops Google. Wait a minute, do they have transit? Not really, but where's the content? They're being accessed for the content and Comcast for the same reason.
So that says that the structure of the way traffic moves around the Internet has basically changed and that basic change is the large content providers, Google, MSN etc, are at the centre of where all the traffic wants to go and come from and then still we have to have the big providers and the basic levels of the Internet. But the traffic pattern has changed.
Then just to say what is a datacentre look like? We're talking about datacentres. What does a datacentre look like? Well, I've been in a couple. It's just a lot of wires and a lot machines. You hear about here's a rack and so I believe this is Google. They've built their own servers, they've built some of their own switches, but basically, they have what you call a top of rack or TOR switch that connects all the servers here and then they what they call end of row switch. So all the switches that connect the servers at the top of rack, there's a bigger switch at the end that it is an end of row switch and then behind that there's an aggregation layer of networking inside the datacentre.
So requirements ten thousands of services, non-blocking network. Almost every server is at least 1gb and now fibre. 10% of the servers are connected at 10gb. That's increasing. So what does that mean? There isn't really 40gb or 100gb inside a datacentre. Not yet. So all of these 10gb and 1gb connections getting connected together are connected by more 10gb. That's enough, but big changes when you have this scale of servers. You have a problem with power, power efficiency and cost. A lot of it is cost of electrical power.
Okay and then just to say what does this hierarchy look like? If you look on the network side of a datacentre, classically today it's three layers. You have essentially the racks, top of rack, end of row. Those are aggregated into other switches and those other switches go to a backbone switch and then there is storage connections everywhere here as well. That's another change that we won't be talking about right now. So a lot of changes coming in the datacentre.
So I think the only other thing to mention before we launch into our questions debate is you can look at what is cloud and I have to say cloud has been around for a long time. Sorry, the word cloud has not been around, but managed services, or services run on a different computer that's not owned by your company has been around for a long time.
In the '70s I worked for a company called Time Share which built its own network called Time Neb which was a precursor to the Internet and there what we were selling, we were selling software applications running on time share machines available from anywhere in the world.
Anyway, all I'm saying is it's a new version of what's been around before. That is the company doesn't have to own the application and today they don't have to own the servers it runs on. Here infrastructure is a service, buying storage. The platform is a service whether it is Windows or Google and then software as a service like salesforce.com or other classic example of the types of services of applications that are being sold as a service off of the Internet.
So I think I would like to start with Peter and say what are you seeing as this is your business right –

cloud? So what kind of services do you offer and what kind of demand are you seeing and is it growing, is it declining, do you see what's going to happen in three and five years?

Peter Martin
Sure.

Michael Howard
I mean an easy quick question for you.

Peter Martin
What in three minutes? It is our business in a way. I guess Orange is the brand name for what used to be the France Telecom Group and like any other organisation of that heritage, we started out many years ago providing an end-to-end fully managed pay-as-you-go service, or telephony which is talking to each other. But basically, what it was, was a very specialist and unique and on its own application. We even defaulted like that in those days and we've kind of done a lot of other stuff over the past 50 to 60 years. But I think what we're doing is actually coming back there.
We're offering the service not just to consumers, but we've got to offer services in the same way to businesses ranging from your sort of one man show all the way up to our largest customers and that presents different challenges. But essentially, it's about delivering services across the network to wherever they happen to be.
The whole point about our services is that you don't care what's going on under the covers. That's why you're buying a service in the first place. You don't want to know. It's not your business. You want to concentrate on the things that are going to make money for you and differentiate you from the competition.
A lot of bread and butter IT and networking isn't going to do that any more. Maybe how you exploit it to some extent is, but the real nuggets in any business are its own creativity and its ability to connect to its market and all the nuts and bolts and IT infrastructure are rapidly becoming a commodity. Just like telephony I think it is fair to say.
What is cloud? It's the re-evolving mechanism for delivering services like this and I think essentially in five or 10 years' time, we'll look back, or maybe my daughter will look back (I probably won't) and say this is now IT is delivered. Why would we do it any other way? Why would we run our own IT environment, or applications, any more than we would run our own power plant in the back garden? So we're in the middle of a transition. Well, we're at the beginning of it. A lot of problems to solve. I think it's inevitable and I'm quite pleased to be with Orange because it's part of our blood. It is what we do anyway, so we're simply extending it to more and more types of service.

Michael Howard
So the basic value proposition has changed for what it takes for an enterprise or any company to build their own datacentre versus buy services elsewhere. When you look at merely one row of a Google datacentre, it actually goes beyond that. That's kind of an old picture because now the server, the blade server boxes you can now insert a whole flock of blade servers into one box like this and it also has storage inside of it. It also has switch, Ethernet connection inside of it. So keeping up with that kind of technology is what the datacentres are doing, how can an enterprise stay abreast of all of those changes? They still have a bunch of computer sized rack computers in their locations. It's a matter both of expertise and then the efficiency of the size, the scale of the datacentres being able to drop the price of storage, or compute power, or applications.
Most enterprises, their big important applications, the applications that are important to their customers already reside in a datacentre in order to be close to a big Internet connection like all of the datacentres.

Peter Martin
Correct. It is all about cost efficiency underneath. A datacentre, a big datacentre that one of my major clients would use, and he would probably have at least two, typically is going to cost in the order of hundreds of millions of euros to build. That's CapEx. This is evil. You don't do it any more and everyone is running out of the datacentre space. So there was a kind of glut of datacentre building maybe a decade ago. You had the dot com boom where everyone invested in it, well all that spare capacity has either been soaked up is obsolete and this is one of the triggers for moving into this new model. We don't want to have to take that on. Is there any way we can avoid, as a business, having to build another datacentre by outsourcing or by using a managed service from somebody else?

The other thing is can we align it. So the money going in better instead of shelling out upfront. Can we pay as we go? The same as you buying services in your own home; it's much better if you've got a monthly subscription that you can vary according to how much you use, that you just buy huge quantities of stuff upfront and hope you've got the sums right. Our people, they're used to that in their private lives, they know the technology is evolving, they're saying deliver it.
The answer is about demand, yes, everyone wants it. We just have to inject some realism into how fast we can do it.

Steve Broadhead
Yes, but Peter, from an architectural perspective, if you've got an IT Manager you don't want the operating expenses or the CapEx do you? So outsourcing makes a lot of sense in every sense there. But there is well documented issues with datacentre repositories whether it's kind of Docklands in London or whatever where literally they have just run out of power from the national grid, so they can't build, so then they talk about how we're going to kind of create datacentres in the middle of the countryside and then you've got to get the infrastructure there in terms of [inaudible] etc, etc.
So if we've got a cloud perspective, does that mean we could actually start building a proper distributed environment, or is that, from your perspective, would that be just an impossible thing to actually achieve?

Peter Martin
I think the first stage is consolidating it and the network allows us to put the datacentres were we can make them most efficient.
If you look at some of the American providers, you've got the Microsoft, Google, HB, they're actually siting datacentres over there where land space is cheap, where energy is plentiful. The first thing you look for when you're choosing a new site for a datacentre is the power supply. How am I going to feed it because it's basically a small town's worth?

Michael Howard
Well you need the power for both ends. You need to power the equipment which heats the air and then you have to power the cooling which takes the heat out.

Peter Martin
Absolutely.

Andres Stern
So it doesn't sound too green. The other problem that comes into this is when you build this somewhere far in the countryside, what performance can you guarantee to bring the content in time to the end user? How do you deal with SLAs?

Peter Martin
My experience with that is that the SLAs is really related ultimately to the application to what content and what application you're talking about because they all have different needs. If you've got a classic well behaved light web application, then you're probably going to be able to guarantee performance because you'll then have so much data to shunt to the user.
If you've got something that it is really heavy duty like video and you've got a complex network, then it's going to be much harder. I will see services developing that offer SLAs and services that don't. It's like every other walk of life, you pay your money and you get what you pay for.

Steve Broadhead
So we're basically saying that there are only a certain number of applications that will actually fit this datacentre and the cloud model at the moment?

Peter Martin
I think most applications are delivered remotely. It's just a question of how far you can consolidate. For example, sometimes we have to distinguish between siting and a customer's application and a datacentre in his own country or in the same continent. Sometimes we can actually move it for economies of scale into a datacentre on the other side of the Atlantic. But it's down to the needs of the application, that's what makes the situation individual.

Michael Howard
Andreas, what does your company do to help this problem of delivering quality of service but you don't know where it is coming from?

Andreas Stern
That was the point I mentioned. I mentioned performance. Now what we did is we brought our flagship from being a hardware solution into being a software solution. So what we can do is we can integrate testing right into the blade server, to test right at the blade server side the applications, the switches and load balance and all the different security elements you implement.
Then on the other side, test from the blade server end-to-end to the end user to make sure that he gets what he needs.
In the discussion this morning I brought up the example of when I came here to Barcelona, the pilot told the approximate flight time would take one hour, but he didn't mention that we had to wait in a queue for de-icing, that we were number 10 at the start. So at the end the flight took two hours instead of one hour. So we can test on the blade server what it takes to perform the application, to what limits we can drive the applications, how many applications at a time and what number of blade servers, but we also can test how much does it take to bring the content to the end user or upload the content to the server to really help you make sure everybody gets a feeling for the end user experience and this is what really counts to the companies.
You brought Salesforce as an example. Now we are not using Salesforce. We use another tube. It sometimes depends on the time of day, the quality of the access you get. Now the performance you get, the information you want to look up. It's really SLAs I think is one of the essential things you need to combine with all the application on the server.

Steve Broadhead
So from my perspective then with this product testing hat on looking at the way carriers have built out massive MPLS network infrastructures in the last few years with billions, is that capable of actually supporting what we're talking about now which is just moving as many things as possible to the cloud? I'm not convinced it is because there is just so much latency involved when you've got multi hubs.
I mentioned yesterday I was doing some trace routes yesterday during one of the panels. For example, to get to threecomm.com which of course won't be there much longer, but it took 18 hops right with per hop latency between about 52 and 250 milliseconds. Now that is a lot of latency to deal with.

Michael Howard
Well now there is also hops inside of the datacentre. You saw that diagram. But not only that, there is now the opportunity of potential or challenge of virtual servers. So we saw a bunch of physical servers, but one of the nice ways of making datacentres more efficient is to use virtual servers. So the VM ware. But now how do you test that? A VM ware may be running an application on one physical server at some point within the, oh there is a lot of load coming for that application, so they replicate that software server on another physical server. How do you test for that kind of environment?

Andreas Stern
Actually this is typical load balancing that they try to do. So this is something we test in the hardware based world. So we test this box that is called load bearance and if it is a virtual load balance, or in the moment it is no difference any more. In the early days, running software on the endware we had a discussion before, they never wanted you to talk about a performance because they knew it works. You can run things on the endware environment. Today you can do it with performance.
Now on a 10gb environment you can get up to 9.gb something in performance.

Steve Broadhead
I can validate that because I've done quite a lot of testing where I've been load balancing and in virtual and combining the two. So we've had a virtual load balancer, actually as in partition, actually load balancing virtual servers and this can be Citrix, VM ware whatever, Microsoft. If we go about three or four years, if we take 1gb as an example to start off with, we would have been lucky to get 200mb/sec from what should be a 1gb link if we were in a virtual environment.
Last year I did testing at 10gb and we were getting approximately 9.9 which essentially is line rate in a virtual environment. So that virtual element which was a stumbling block before, a big bottleneck, is

no longer the problem. That's not the problem. I think the problem is the management thereof. If you've got the scenario where the data is spread across multiple virtual servers and multiple physical machines, then going back slightly to yesterday's topic which was security, you've got to have a huge amount of trust if you're outsourcing major applications, your data, into that environment which is being shared even on a physical server with other people's data. That's almost more of a concern than performance at that level I would say.

Michael Howard
So we have lots and lots of issues. So I suspect someone in the audience is curious and has a question. Is this true? It's okay to raise your hand at this point and ask a question. If not, we'll make up some more.

Peter Martin
It doesn't have to be about computing. It can be about wine or sport or anything really.

Michael Howard
Well one of the ways that a physical server can now be much more efficient like with a 10gb NIC card in it connected to the server is that the NIC card now has the intelligence that it can support multiple virtual servers on that physical server right? That's part of the efficiency comes from the smarter network interface card.

Peter Martin
Yes, a lot of it is just to do with the driver software because it has been, whereas a few years ago it was just generic drivers people where using and they didn't work. As an example, a company called Solar Flare who is based in the UK and in the US they make their own 10gb chips and NICs. Basically they've spent two years getting the drivers right so they could actually support a virtual environment at those sort of speeds. It wasn't trivial. It was a lot of work that we got involved in.

Michael Howard
But a very nice advance like that causes a more complicated environment to test in. Peter.

Peter Martin
I think these problems, although they are unique to this particular moment in time, they aren't really any different from the kind of problems that we've had to solve for the past 40 years, which is this is what I want to do with my computer but it's too big, how do I get it to work? Eventually you find a way, or the economics catch up with you and it becomes possible. So this is a snapshot in time that needs to be overcome.
What we're trying to do collectively I think, all these issues are part of this, is get back to the notion that we're building very large big computers. But in fact, it's not just a large set of wardrobes in a room; it's an entire datacentre. What you're building inside it is actually one single, effectively, a single system that you want to share across a very large number of multiple users or organisations. It's kind of a wheel turning full circle, but with a few added extras over the past 40 years.

Michael Howard
Okay, we have a question in the back. Ofer.

Ofer Shapiro – Vidyo
How many datacentres, 10,000 servers like that exist in the European and what's kind of the growth? That you see the number of datacentres and the number of servers per datacentre?

Steve Broadhead
I may be able to answer that question next year, but today not. Sorry, I don't know.

Peter Martin
I have no idea. Not yet. Not any more.

Michael Howard
You've stumped the panel. You get a prize, a bottle of wine at the end of the day.

Peter Martin
About 10,000 servers. Probably more than you would imagine I think.

Michael Howard
Ah, there we go.

Peter Martin
I'll fence.

Anthony Savvas – Computer Weekly
I'm just wondering, obviously the market is developing, but surely it's only going to take one major incident from one major company to kill the whole cloud market in terms of data protection. Obviously you can outsource the data management but you can't outsource the compliance, the data control. Even if you've given another company the responsibility for controlling the data, the Information Commissioner in the UK or the equivalent in America, Germany and France is going to come after you if your provider loses your customer details. So surely that's going to be the case. Sooner or later a major incident is going to happen and probably almost kill the market.

Andreas Stern
Like I told you, it will break. It's a security issue. As an enterprise you may be attractive for attacks. As a datacentre you're much more attractive for attacks. So these datacentre providers....

Michael Howard
Data centres do get attacked.

Andreas Stern
They get attacked a couple of times every day, so they have really to invest much more and they can because they are representing a community, so their operational cost can be higher because they charge for it.
For an enterprise company who protects himself, it is too expensive. So grouping this together they can invest more into protection. They can add different layers of protection. They have mirroring of data information in different locations to make sure if there is an incident in one place that all the information is mirrored into two or three other places.

Michael Howard
It also gives more places to look for that data too if you're replicating it.

Peter Martin
Let's say if there was a problem, which is what Tony is saying, I think the issue with the scenario where we're in the cloud and it's virtual is there is going to be a hell of a lot of finger pointing and blaming going on, whose actually going to take responsibility for what happened?

Anthony Savvas – Computer Weekly
Exactly.

Michael Howard
There's probably a hole in Microsoft somewhere.

Peter Martin
I think it will raise questions. I don't think it will derail the whole exercise. It will be a setback in the way that these things normally are, but I think that economic pressure and other factors will push it forward again. Security problems are occurring all over the place in every walk of life. I read in the FT this morning some very large organisation, probably British, but actually in this case no I don't think it was, some of its employees have put the basic details of all the employees of the Group onto the web. I can't remember the name and I probably wouldn't mention it even if I could. That's 174,000 employees I think. But that company will remain in business. It won't go out of business for that reason.
We do this already and big companies they're pretty harsh on us with the Ts and Cs and nailing down

the security that they expect to be getting. But they have to retain ultimate responsibility for the data. It was Shell, thank you.

Steve Broadhead
That's Shell by the way.

Peter Martin
There you go. The web, isn't it wonderful.

Steve Broadhead
If I can raise a different issue here, it's like if we're talking about a new architecture we're still talking about people using applications like Oracle SAP that we designed for mainframes 30 years ago. Isn't the real opportunity in a completely new form of software selling at the enterprise level and not just kind of software where you buy a product and you have to do it the way they tell you to, but basically platforms that you can build out from, pure web service software of the service base in the first place so they will run as quickly as possible even if you're over a mobile broadband. For me that's a new opportunity. Unfortunately, we don't have any ISPs here.

Michael Howard
Well thank you. I think we're going to end on this note and to keep us moving along today. Thank you very much panel.

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