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# **EDITED TRANSCRIPT**

VZ - Verizon Communications Inc at Wells Fargo 5G Forum

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#### CORPORATE PARTICIPANTS

Kyle Malady Verizon Communications Inc. - Executive VP & CTO

#### CONFERENCE CALL PARTICIPANTS

Jennifer Fritzsche Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

#### **PRESENTATION**

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

We're excited today to kick off the 5G debate with Kyle Malady. Kyle is the CTO of Verizon. I was going to say Verizon Wireless. I'm going back to my old roots. So we kind of - welcome. Thank you very much for joining us.

**Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

It's great to start my day here, interest thing on the Barcelona. It's funny because when I was over there, everybody is asking me how I could build 5G without Huawei. That was an interesting thing I got there.

#### QUESTIONS AND ANSWERS

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

That's right. So may be just starting with your 5G, we'll kick right into it, 5G for your fixed wireless, you -- Verizon launched your fixed wireless broadband solution last year in 4 markets. Could you kind of summarize what you have found? What are the learnings so far or primary findings?

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes, yes, yes. Let me go back a little bit on that because 5G -- there's 2 components when we think about 5G that we really needed to understand and learn about. First is the kind of the technology that 5G brings, but also what we're doing is we're putting the technology on millimeter wave spectrum. So it's different spectrum that we -- than we've used previously because it's in much higher frequency ranges. And it had never been used really for any kind of mobile-type or fixed wireless-type application before.

So what we endeavored to do is years ago we started our own, what we called, TF forum and we developed our own specifications, so we could get out and we can learn about the 5G and millimeter wave. And so we developed that and it's a subset of the overall NR 3GPP specification. But the whole idea was get out first, we'll build some gear and we'll get into some markets with the easiest use case that we can think is fixed wireless. And because, obviously, it's a lot harder to steer beams around when you're moving, it's a little easier when you're in a fixed place. So this is all so we could learn and we could understand and characterize the network in the millimeter wave. And frankly, we've gotten it out there. We've built roughly 1,000 cell sites, they're all hand built. We have some of our partners build CPE for inside, and we've been for the last handful of months out deploying this and learning.

And so it's been great for us because now we're starting to understand the characteristics of millimeter wave and then how we can model it in our tools and how we can support it and what works well and what doesn't work well. One thing that we're very happy about is when we built these units -- these CPE units, we put 4G in as backup because we weren't sure -- you hear a lot about fade, rain fade, et cetera and we weren't sure how it would work. So we put LTE in as a backup. But what we're really happy right now is that it stays up on 5G all the time, 99.99% of the time it's...



Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

No wind, leaves on trees?

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

It stays real solid. It's stays up on it and it's really good. The other thing that we've been doing is at some point when we go further in this market, we like this to be really self-setup. But in these initial days, we're actually having a white glove installation. And the reason is we can get a lot more data. So if we have somebody in the house going around, taking measurements, understanding where the best place to put the equipment is, we're learning a lot from that as well. So, so far, it's been a great learning experience and we're taking that into our mobility work that we're doing.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And so can you talk a little bit about the achievable speeds your seeing? I guess, the logical next question is how do these compare to cable, you listen to companies like Charter and they talk about achieving 1 gig speeds in all markets if customers are willing to pay for it, right? How...

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes. Well, I mean, we've -- in our Fios markets, we launched 1 gig a long time ago, and we have it -- we have full coverage with 1 gig in our Fios markets. And people pay for it, people love it, so -- but that's the beauty of millimeter wave and 5G. We're seeing in fixed wireless and our test markets over a gig consistently.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Right.

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes. I think we've been marketing it like 300 because obviously it has a lot to do with how far you are from the cell site and some other things, but -- so we've been saying, pay \$300, we'll guarantee, but people -- a lot of the folks get over a gig consistently. And they're using it with -- some of these folks are power users, I think, that's why they opted to use our service. They have -- some of these folks have like 20 or 30 different devices rolling around in the house. And so far, very good feedback from the customers about how solid it works, the throughput on it, the reliability, so -- and very little churn so far.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And you've put out a stat, I'm forgetting what it is, but how many of those customers are already touching Verizon in some way through either...

#### **Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

It's roughly 50/50. So I think we did -- I'm not the go-to-market guy, but roughly -- we give you a deal. If you're a Verizon wireless customer, we -- you get \$20 off or something. And then if you're not, I think it's -- I believe it's \$70. And so far, it's about half-and-half. You got about half-and-half going.



Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

So you mentioned stage shifting to the mobility just in the past month or...

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Couple of months.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Couple of months, you launched 2 markets, 1 of which is my own Chicago and Minneapolis.

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes. Great town.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Can you talk about what you've learned in these past few months? What type of propagation are you seeing from that millimeter wave?

#### **Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

Yes. So we've learned an awful lot in the last couple of months. And it's every day, every single days we're grinding out new features and fixes. It's interesting. The industry has changed a lot. It's -- I've been doing this a long time. Back in the day, we'd come up, we would work on something and then it would take a couple of months for us to get the software to load into fix something. Now it's literally every other day we're loading new software in to make fixes and increase performance.

And some of the things, I mean, technically that we're working on right now, is how do we move it up. There's something called CCs, so you chunk the spectrum into segments. And right now in these 2 markets, we're only using 4 segments, so 400 megahertz. So we're only using half roughly of what we potentially can, and we're getting crazy speeds over 2 gigs, et cetera. But we're working on bringing that up to 8 CC. We're also working on what they call beamforming, so we can optimize that. And about like 7 or 8 other critical technical things, they're just new, right? And so every day, we're working with our vendors to optimize these, to learn more. We have all manner of test sets out there understanding deeply what's going on and we just keep working on everyday. And every day, we see progress in terms of capability in terms of either coverage or speed or latency, what have you.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And how about -- you've talked about 30 cities for mobile -- for mobility by year-end, that's still...

**Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

Yes, that's exactly right. Yes.



Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

How much additional infrastructure is needed in terms of small cells and fiber miles? And is it fair to say like this spectrum works if only you have fiber behind this? Is that too simple a statement?

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

No. I mean, it's actually good. So when we were thinking about this years ago about safe harbor statement.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Safe harbor. I'm sorry. I missed.

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Sorry.

#### **Unidentified Analyst**

Is there anything about fiber (inaudible)

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Safe harbor statement, you guys all know what this means. Oh, yes. Years ago when we started thinking about this, as the networks flatten and the antennas get smaller and you put them lower, I think the best way to characterize this is frankly wireless becomes fiber with antennas hanging off a bit essentially. And so that's why we decided that we wanted to go big into fiber. We wanted owners' economics, right? And so we wanted to be kind of masters of our own destiny as we're deploying our wireless network. And it made sense to us because we're going to go -- we're going to be densifying 4G. We saw 5G coming, and then we see a host of other uses for the fiber. And so that's why we've been down, what we call, One Fiber path for the last few years and over 60-plus markets we've been deploying fiber -- dense fiber in these markets.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And I think Hans put the number at, 1 million -- or excuse me, 1,000 route miles per month in 60 cities. Would you say you're going as fast as you wanted a year ago? Or could you always go faster?

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

I feel we're going a lot faster than we were when we first started as everything has been the flywheel up. I feel we can go a little bit faster, but as anybody who does this knows, this is frankly construction. And I told Brady, me and my knuckle-draggers, this is what we do. But frankly, we're out there working with every towns and trying to get permits and scheduling time that you can put the fiber in the ground, getting construction crews who are capable of doing it in a good economy. All of those things they just take time and you just got to keep working them through, but we call it a pipeline. So we just keep filling the pipeline, keep filling the funnel and then squeezing all the work through as we go. And like I said, we've been at it for a while, and we're starting to really pick up our -- pick up steam and -- but we're on track to where we want to be.



Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

You mentioned a tight labor market, I keep hearing that. A lot of phones ringing for fiber deployment. Is it hard? Is it...

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes, but we kind of saw this coming. So we have great partners. We locked up a lot of different folks in this space who do the construction. They've been partnering a lot with us. We've been working closely with them. And frankly, the other thing we worried about is the supply fiber in the world. And so years ago, we did deals with Corning and Prysmian.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Prysmian is speaking later today.

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Okay. Great. They're great partner. And Corning built out a lot of capacity to support our need. So we kind of saw some of this coming early on and we locked up our vendors and we're in pretty good shape right now.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Got it. Perfect. Just how about the 5G deployment within your wireline market? Are you -- is that something -- how many states? I always lose track, 7, 8...

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Well, I refer to them as the original 13 colonies, but...

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Okay. All right, but will you be aggressively deploying that 5G deployment, how was the (inaudible) translate?

**Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

Oh, yes, yes. So I think if you look at our overall strategy right now and even when Hans talked about it and Matt and Brady about how we are Verizon 2.0 and really kind of the technology transformation, we're building networks once so that everybody can use them. So we'll be putting out the 5G network in footprint. It will be first for mobility. But then over time, if we decide we want to offer other services, we'll make those choices at that time. Right now, we have a great Fios franchise in our footprint that people love and enjoy, and we've won all kinds of awards. It's a good service. And what we want is optionality, right? So we will build a network in whatever we can -- whatever our customers want, we will hopefully be able to serve them.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

You mentioned spectrum earlier and I know that's been talked about a lot. You have a tremendous amount of millimeter wave and with the Straight Path acquisition, that's kind of a game changer. Now there's more coming. How do you -- just I guess the open-ended question, how do you feel about your spectrum portfolio is today from an engineering standpoint?



#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

I'm very happy with our position. I mean, even -- like you said, we've been doing this a long time. If you look at the first 20-some-odd years of my career, I think we have about 116 megahertz on average around the country. It took that long to get that much. And 2 months ago, when we lit up Minneapolis and Chicago, I basically put 3.5x more spectrum in play than I had the whole 25 years before, and I still have more room to go. So that's why we love millimeter wave because there's so much of it and you can do so many things. It opens up so many possibilities for innovation and for people to do things because there's so much bandwidth.

Now yes, people detract because maybe it doesn't cover as far as others, but I mean, obviously, we knew that. We know physics. We understand what it's going to be, but it carries sufficiently far enough that we can utilize it. And that's where we're going to just keeping working on. We're going to keep working on how do we get more coverage out of it, how do you get the link budget that can keep -- you can propagate it as far as you possibly can.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And maybe I'll put this and get the question out of the way category, but everyone is interested in C-band. You had an ex parte filing with the FCC, I think last week about opinions there. Is there -- do you feel the need for more -- I guess, just bluntly, do you feel you're vulnerable in mid-band?

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

I don't feel vulnerable at all. But as an engineer and technical guy, I'll always take more spectrum. This kind of -- it's the lifeblood of our industry. I'll always want more because if I have more I can do more. All -- we're operating in all manner of bands right now and they all have different characteristics and we've been managing that for years. Our plan of record is the spectrum I have right now, the 116 megahertz that I talked about, I can easily convert that to 5G over time and make coverage layers. Now however, it would be great if FCC figures out a way to put that C block spectrum out there because obviously it'd be clean and I could do some really good things with it. So would I like to have it? Fantastic. Do I need to have it? Not necessarily.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Got it. Okay. Fair answer. Shifting back to fiber and the infrastructure, do you have -- Verizon always has been a company that strikes me as wanting to control the network, preferred to self-perform if you can. We have small cell operators and tower companies here today. How do you look at that? I mean, would you -- versus leasing fiber, owning fiber, et cetera?

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes. No, we — I mean, we have great partners that have helped us build this network over. Yes, we do like to control our own destiny. But sometimes that takes longer than you would want. And Crown and American and others, we've been partnered with those guys for long, long time. I continue to see that happening. Zayo's of the world, other folks that we get fiber from and our facilities will continue to partner with them. But as a general matter of philosophy, we do like owners' economics, especially if I go back to the point where if it's really a fiber network with antennas hanging off of it, that's — we want to be positioned to be owners' economics.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And you've talked about with your fiber strands, I think you said 1,700 strand counts, I realized that's not everywhere or maybe it is...



Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes. Well, no. And we'll have that amount in every single market. But it's not down every lateral, but in general, we have big pipes like that in every city.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And is that -- I mean that's by my estimates about 4 to 5x the thickest fiber we've seen out there in many cases. So is this very much future proofing the network or...

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes. Yes. So when we started thinking about this — that cable didn't even exist by the way until we went to people like Corning and Prysmian and said they didn't have the capability to manufacture it. So we worked with them to manufacture. And really, it's not rocket science. Really what we're talking about here, the incremental cost of glass is not very much. It's — all the cost is when you're digging up the street, you have to replace it and the manpower and the labor to run it and splice it. That's really all of the costs. So we don't see anything in the future that's going to be a better medium for connectivity to connect up networks than fiber. We just don't see anything. And so we decided we will push the envelope from an engineering and technical perspective, innovate with our partners, see what's the biggest pipes we've come up with. We'll put them in the ground and then it'll be there. It's almost like spectrum, right? We'll put the acid in the ground and then we'll be able to utilize it.

And it seems fundamental, but it's a big shift for Verizon because the way we use to be structured -- I have engineers who would engineer fiber for each one of the customer-facing business units. So the Fios people would be doing some fiber, the Verizon business people would be doing some fiber, wholesale. And they -- all the engineers would be just optimizing to their -- how many strands do I need to put down the street for my business. And that was probably the right way to go at some point because may be the incremental cost of glass was more. But the game has changed now, and so now we've gone to this more One Fiber approach.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And with Verizon 2.0, which went live April 1, did that help kind of streamline internally?

#### **Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

Yes, absolutely. So we're -- now we build it once and then everybody can utilize it. Back -- if you go back, say, 10 years, the folks running the Fios fiber, the Verizon business folks could not leverage it, right, because it was for different business unit. It was engineered differently, kind of different characteristics. Now when we put the fiber in the ground, any one of our business units now, or frankly, in the future, if we decide we want to change that we're doing something, open up a new business, do something different, I'll have that asset in the ground I'll be able to utilize it.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Got it. So you view fiber very much as out the long pole in the tent to any sort of 5G solutions?

#### **Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

Well, there's a couple. I think there's the deploying of the fiber is part of it. The other part of it is you have to do the renting and the leasing of space, so you can put your antennas on, and that's -- sometimes that's tricky. You have to get the zoning and all those things. But there are things that we've dealt with as an industry for the last 3 decades, so nothing that we don't know about, but it's one of these things you just got to keep grinding it out, grinding it out, and we're kind of a machine at that.



#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Just on fiber and the competitive landscape right now, I mean your #1 other competitor in the wireless industry is actually kind of talking about slowing down fiber deployment. Does that, just as an engineer, surprise you? Or does that -- I'd love your opinion there?

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

I am not sure what the -- what the situation is, what the situation is and why they're making that decision. Maybe they feel there's other places to put money, but for us, this is -- fiber is fundamental, it's core to our strategy and getting into ground. And we'll put it in, the world is going to evolve, the world is going to change. We think it's kind of future proof right now and we'll be able to -- we'll definitely be able to use it. That's a great opportunity for us.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

And Verizon has talked a lot about this MEC, mobile-edge computing initiative. How do you -- I guess, your opinion of how you see the edge evolving? Some would say edge is kind of an overused buzzword right now. Do you agree?

#### **Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

No, no, not at all. I think there's a lot more different hype curves than this one. This one -- I am a true -- What is old is new again, too. I'm a true believer as compute moves closer to the edge along with high-speed, really low latency networks like 5G, you bring those capabilities together, I think it's really going to be a platform to change the way people use compute power. We've done a lot of proof-of-concepts in our labs. And the things that you can do with local compute at big scale is crazy. One of the best -- we've done probably 15 or 20 different demos and one of the best ones I saw -- how many people -- and you get AMBER Alerts, right? Do you guys get AMBER Alerts? Anybody ever find anybody? I didn't think so, right? It's kind of like a needle in the haystack deal, right? But we did some simulations right here in Times Square using video image capture and low latency wireless and mobile-edge compute where you have enough cameras and cameras on policemen, you can actually do all of the computation and you can actually match a face. And then you can react so quickly that you can find -- because of geolocation, you could find the nearest police officer and then say where the person is and say -- and route him to that person. So I mean, these are the kind of different you would think are not even possible, but they are going to be possible in the future because of the high bandwidth, low latency and connectivity and compute that's going to be coming to market in the years to come.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

But how -- that's a great example, but how far are we from that? I mean I'm just thinking in my head the amount of infrastructure that must be needed to get there is massive.

#### **Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

Well, I think one of these ones is going to be probably a little farther out just because you need -- in that case you need a lot of video cameras, you'll need more compute than we're like talking about right now. But there's a lot of different use cases that are more here and now that I think we'll be able to use. And what will happen is, it's not going to go like the cloud, like it's right in the middle and then it ends up on the edge. It's going to be slow, it's going to keep going out. So it'll go closer, closer, closer. And then at some point, you might even just have a MEC in say this hotel, doing things. So it's going to be an evolution, but I really believe the fundamental promise of it and potential is huge from what I've been seeing.



#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Verizon, you've been very flat with capital spending, I know you're not Matt, so I'm not going to ask you about the numbers. But from an engineering standpoint, when you think of things like this, is there more -- I mean, do you when your team want more money to just run, is that like...

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Here's what's great about the company, Hans and Matt. If I need more, I'll ask and they'll listen if it's a good business case, they'll give it to me. Right now, I have enough money to get done what I need to get done at the pace I want to get it done. And we're always looking for opportunities to invest in new things, especially as 5G comes and we have our 5G labs. And so any new things, I feel free to go to them and ask them about it. But right now, we're on a good path.

The other thing is though, we're actually trying to -- and One Fiber and Verizon 2.0 is a great example. Not only are we innovating and putting the networks of the future out there, we're trying to do it much more efficiently and drive costs out of the business, especially in LTE world and Fios and everything else. And as a result of Verizon 2.0, we've been able to bring a lot of pieces from the different business units the way we put together and make them one. So for instance, Verizon business had a kind of a core backbone and so did Verizon wireless just because the way they were engineered and how they came up. We put those together. So frankly, in that core, I haven't spent any CapEx in 2 years. So those are the kind of things that we're -- anybody can spend money to build something. In my mind, the definition of an engineer is somebody who could build something for cheaper and better, and that's kind of what we push our guys to do all the time.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

You mentioned cost reduction and that it seems like there's a lot of push down on either vendors, towers, I mean just industry overall and there's some resistance. How do you think -- are you seeing some infrastructure providers and vendors play ball with you and understand those costs because I couple that with like labor shortage, hard zoning, how does that all balance themselves?

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Well, that's — I mean, that's just the open market, right? So that's where we're out there every day, we're working with our vendors. Our vendors get it. They understand that we need to — we always need to be improving our cost structure so we can maintain some competitive advantage. They understand that. We make no bones about it. They work with us and we're always looking for better ways, cheaper ways to build our networks. And so far so good.

#### Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Good. Great. There is an iPad here and I understand you guys can send or text, the instructions are here to send some questions up. So Kyle, it looks like I have a few questions. Are there coverage areas in the rural part of the U.S. that you don't have fiber coverage and could take advantage of the capacity that becomes available as...

#### Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Yes. So I guess, it goes back to the point, we're still going to do business with like Zayo's, Crown. That's going to keep going because it's a big country. There's still a lot more to go. And if there is fiber already in the ground, there's already assets I can leverage and it makes more financial business sense to leverage that, we're going to do it. Now we're spending — if you go down to D.C., a lot of the dialogue about this whole digital divide and rural coverage and that kind of seems to dominate. We're spending a lot of time right now thinking about how we can help. It's kind of a — there's a whole bunch of different technologies we have. So really what we're trying to define now is how could we define a problem that we can help solve and just wanted to leave you with that, we're thinking about that because we hear that a lot.



Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Got it. Okay. Power came up at our dinner last night. With so many antenna space, are you addressing -- how are you addressing the power supply to your equipment? Does power become part of your focus?

**Kyle Malady** - Verizon Communications Inc. - Executive VP & CTO

Yes, actually it is. So we have a whole team who focuses on innovating in the power realm. As a matter fact, we're -- traditionally we just run AC to it. We've been working on some technologies with some of our providers, where we can actually embed DC power into the fiber strands. So when you're running small cells up the street, we don't have to connect power to each and every one of them. They could run DC through the cable. The problem is you need to do it in a safe manner. So it needs to be -- but there's technologies available now that you can run the DC, it can be safe and we're actually trialing that right now because we think that could be -- that could speed up our deployment time. Because once again, it's another factor in the soup making, right? There's -- you need to get the power guys to come out and provide it for you.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Got it. So as at end, I mean, you're the CTO of one of the largest wireless company. I mean, you're sleeping at night, what's the biggest worry?

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

My biggest worry is -- listen we supply service to a ton of customers and they use it for their mission-critical work they do every single day. My biggest worry or it's not a fear, but it's what's ingrained in us is building reliable networks that our customers can trust. And as a matter of fact right now, I have a switch that's having a problem in Belgium right now, so my guys are on it. But all the time, just making sure keeping up our reliability, living up to the brand promise I think is probably the best way I would characterize it.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Great. So you've given my favorite quote. Fiber with a bunch of antennas on it. I love it.

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

There you go.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Thank you very much, Kyle.

Kyle Malady - Verizon Communications Inc. - Executive VP & CTO

Thank you, Jennifer for having me. I appreciate it.

Jennifer Fritzsche - Wells Fargo Securities, LLC, Research Division - MD and Senior Analyst

Thank you so much.



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