DR: [00:00] I'm Danielle Royston, and this is Telco in 20.

[00:14] Remember that time we took over Ericsson's space at MWC21? I'm sure Ericsson is sick of hearing me talk about it. News flash, I'm never going to stop talking about it. We took over 65,000 square feet in Hall 2 and renamed it CLOUD CITY. We had demos, speakers, live coverage, cloudy cocktails, and even a super awesome, invite-only, private Bon Jovi concert. It was epic. I was transported back to CLOUD CITY when I saw Nokia's exhibit at this year's MWC. It was pretty stunning. The front of the booth was transformed into a giant Nokia logo with awesome mirrors, screens, and colors. I have to admit, I had a little bit of FOMO looking at it. Nokia unveiled an awesome rebrand, coupled with a pivot to reinvent themselves. Going forward, they see enterprise and B2B as the future of telco. A lot of people I talk to are thinking this way too, so maybe they're onto something. Today's guest on the podcast is Azfar Aslam, Nokia's CTO for Europe. He helps customers get future-ready with the right strategies and technology.

[01:20] We're going to talk about the company's shift towards enterprise use cases, how they're tackling refactoring legacy products to be cloud native, and, one of my favorite topics, just how much of network workloads can move to the public cloud. So, let's take 20.

[01:39] Azfar Aslam is Vice President and Chief Technology Officer for Europe at Nokia. Hi Azfar, welcome to Telco in 20.

Azfar: [01:46] Hi, Danielle. Great to be here.

DR: [01:48] I'm so psyched to have Nokia on the podcast, big name, and really excited to learn more about what you guys are doing, obviously not only with the public cloud, but just in general as you make your pivots, like I saw at MWC. You guys unveiled a really great new brand. We'll talk about that in a second. But I always like to start and ask people, "How did you get into Telco?"

Azfar: [02:09] Well, that's a great story of serendipity. I think, right place, right time. When I graduated, I was trying to become a physicist and I was really in that decision-making process of, "Do I focus on the little particles or the big cosmos?" And one day, my lab partner said he's going to do a master's in telecom. I said, "Well, why do you want to go and fix people's phones at home?" And he then explained, "No, this is a transformational industry. Mobile's just come, satellite's happening, fiber is coming." I spoke to his university, they took me on, and yeah, I never looked back.

DR: [02:38] That's awesome.

Azfar: [02:39] Then I joined the giants like Fujitsu, Lucent, continued the journey through Alcatel-Lucent and Nokia. So yeah, exciting place to be. Absolutely the right decision.

DR: [02:47] Now you're at Nokia as a Chief Technology Officer for Europe. And so, what are you responsible for?

Azfar: [02:52] My primary role is to help our customers evolve. For example, this decade we have a vision called Vision 2030. What big trends do we need to take care of? What are the disruptions that our customers will face? And then, kind of figure out what the technology and business strategy ought to be for us and our customers. And so, I work with our customers to make sure that they are investing in the right areas, driving the maximum return on investment.

DR: [03:16] Yeah, that's super exciting —helping them craft a strategy and I like to call it live in the future. So, like I mentioned, the talk of MWC this year was the Nokia rebrand. I really wanted to walk through that beautiful tunnel. I saw how you guys were creating the bending of the graphics and I'm like, "This is an incredible booth." And so, why the pivot and why the rebrand?

Azfar: [03:41] We're glad you liked it.

DR: [03:42] Yeah, I loved it.

Azfar: [03:43] So, Nokia's roughly 150-year-old company, has gone through a number of transformations. Some people still think we might be selling smartphones, right?

DR: [03:51] Yeah.

Azfar: [03:51] I think we got to a juncture early this year, late last year, where we said, "Okay, look. We are doing something radically different." We are, of course, serving our customers, CSPs (communication service providers), and delivering the networking technologies, the operational capabilities, but we are also helping a lot of our industrial customers all over the world to realize the benefits of industry 4.0. But, it's also an attempt to make sure that the company seems to be in tune with the times and make sure we can attract the right talent going forward. So yeah, it's an attempt to change how the world sees us.

DR: [04:25] And so, it sounds like you guys are pivoting the focus more on enterprises and B2B use cases. I think a lot of people agree that maybe for 5G, that's really where the expansion can be seen. I think of Nokia, like you said, a little bit maybe rooted in the past, more of a hardware company. Are you guys starting to focus more on software or shift away from hardware?

Azfar: [04:48] I think the way to answer this question is, first of all, the thesis evolves over time. So, you're right. Back in late 90s, 2000s, this was predominantly a hardware business. Then came the 2010s with the virtualization and the general purpose platforms and hardware solutions. And so, we went through that transition where the hardware actually got commoditized and the focus was indeed then on software. I think we thought that thesis on software will continue and that we absolutely need to become even bigger. By the end of last decade, we were almost the number 1 player, from a market share point-of-view on the software in the telecoms industry. But coming into this decade, what we also realized was that the cost and the performance equation isn't balancing out going forward. The 5G was coming out, new capabilities and new services were needed. So, what we started to look at was, how do we optimize that equation once again? That's where the

mastery of the silicon started to become really important for us. We call it system on chip.

[05:46] If we don't control that part of the industry value chain, then our customers will have to spend more, equipment will be costly, the solutions will be costlier, and they will be less energy efficient. So, I think Nokia today is absolutely focused on a very high quality software and monetization of that, but we are also focused on making sure that we don't lose sight of what's needed on the silicon.

DR: [06:08] So, from a revenue split, when you think about the hardware revenue versus the software, is it split down the middle or is it back to being skewed more heavily towards hardware?

Azfar: [06:18] Yeah, it depends on the portfolio that we are looking at. So, there are some portfolio items, particularly in our software business, which are very heavy software-oriented. Then when you look at the hardware-oriented portfolios—like the fixed-access networks or the fiber networks—they're predominantly hardware oriented and that's kind of a specialty of a company like Nokia, that we have the right to play in each of these domains. But yeah, the revenue mix will be different.

DR: [06:43] Well, let's talk about the cloud. I don't think my next question is too surprising. So, what does Nokia think about the public cloud? Is your expectation as we continue, that CSPs will dictate which cloud they want to use? And so, as a vendor, you really need to design your products to be cloud agnostic, so you have that flexibility built in? Is that Nokia's position going into the next decade?

Azfar: [07:07] Absolutely, and actually I'll go as far as saying that you will be hard-pressed to find another telecom player in our part of the industry that's so heavily intent on working with the public cloud and cloud of all types across the globe. The reason is very simple, and you have to look at the answer in two dimensions. One is the adoption of the cloud that Nokia has done in our own business and IT transformation. So, that was a no-brainer. We wanted to be

cloud-first going forward with all our software and enterprise operation strategy. But then when you look at our business, the products and solutions that we make, they are all going into cloud now. So, 5G was the first technology which was born in cloud, particularly the core networks, so they became cloud native. When I look at the work that we have done, particularly in the last three years with all the three webscalers, Microsoft Azure, AWS, and Google, we were quite early in that exercise of integrating testing and learning how our products would actually perform in the cloud arena.

[08:07] So as a result, we have a strategy where we are porting a lot of our capabilities and a lot of our software from the old way of working into the cloud-native environment. But then, all the new products and services that we are creating are actually born in the cloud environment. So for us, it's a natural next step in terms of the software evolution. Then, we also look at capabilities like the marketplace that Azure offers and others offer. So what we are doing is also putting our software out there via these platforms so that it makes it easier for our customers to buy, consume, and manage the lifecycle of these solutions. So, yeah. For us, it's a no-brainer.

DR: [08:44] I would imagine that's a little bit of a challenge though, because you either have a choice from a development perspective, an engineering perspective, of either keeping my code base common with as few changes as possible for all the platforms or forking the source code and having different versions. How do you decide when to say, "Hey, we really want to adopt a particular element of this cloud," and it actually becomes a second code base to support? How do you guys manage that?

Azfar: [09:13] We went through that learning cycle, learned our hard lessons very quickly a few years ago. So, we ended up with a strategy where we are going to have a common software application layer that will then work with any cloud. And that's what we termed as our "any cloud" strategy starting with the core networks. And then when we went into other parts of the networks like the mobile networks, radio access networks, we are doing exactly the same thing. So, it's one software that will work in any cloud

environment, whether that's any of the webscalers, whether it's some of the other producers of the CAS platforms, YAS platforms. Our strategy is very simple. No matter in which incarnation of cloud you choose to deploy, whether it's public cloud, private cloud, hybrid, edge, on-prem, the same software will now be seen in all of those areas. That brings a lot of simplicity for our customers while giving them a lot of flexibility.

DR: [10:07] And so, by being cloud agnostic, obviously that means you can support more platforms. Again, I'm the public cloud girl, so I'm going to make my public cloud point. I think by not being public cloud native, you're missing out on some of these really big benefits that the hyperscalers offer you—big cost savings. It means that you guys can't code directly, to say, the graviton chip that would reduce the performance and compute needs on your applications. And so, do you guys see in the future starting to refactor these applications to be native to these hyperscaler environments? Or it's just too complicated and it's better to have, like you said, a common software base to maintain the customer deployments?

Azfar: [10:48] I'll be a little bit controversial here. I think cloud native is the first priority for us. We should be cloud native, whether it's in a public cloud environment, private edge cloud, centralized cloud, or on the on-prem cloud, because that's what the customers require. They need any of those combinations to make these solutions work. When it comes straight to the notion around the public cloud, I think one of the things that we've done is spend a lot of time with all the major public cloud companies, as I mentioned earlier on. What we found was that the way that telecom applications work, they require the cloud to be tuned in a certain way as well. This is where we started to work with these partners in the public cloud environment, the webscalers, and we started to create blueprints, which then need to be implemented before the applications can be run with the same high performance as they're run in a private cloud environment.

[11:43] And then when we went as far as putting the mobile networks in the public cloud environment and testing them there, we realized, actually, the performance can only

really be delivered via adding some secret sauce, which is effectively taking a bit of our system-on-chip capability from our own internal platforms and putting that into a public cloud platform in the service there. So, I think through those learnings and combinations, we are getting there in making sure that the software will remain common in all the cloud incarnations, but it will also deliver the performance that our customers require at the right cost.

DR: [12:17] I think I see the hyperscalers, even in this journey, let's call it the last three or five years, moving to become a carrier-grade public cloud. I think everyone's in a little different spot if they're fully ready today. Some say yes, you've got people like Marc Rouanne at DISH, who's doing Open RAN and building everything on AWS. You have other people on the other side of the spectrum. So, it's super interesting. I think the question of the year for me is, where is that line? Does Nokia think, eventually, maybe in 10 years time as the hyperscalers continue to evolve—they listen to you, they adopt some of your system on a chip and embed some of that technology—will we see network workloads running in public clouds? Or, you guys still don't see that and it's going to be still a lot in private clouds and, let's say, on the ground in private data centers?

Azfar: [13:05] Yeah. I'd say that, first of all, we recognize that skill as the public cloud companies as potential network builders of the future. That's exactly why we have invested a lot of time and money and effort with them to understand how these network applications will work in their environment, how will we achieve the performance at the right cost, et cetera. When it comes down to drawing a line on what we will move into those public cloud environments, you have the same usual suspects that everybody talks about. You have the national regulations in certain countries where the customer data and privacy becomes a stumbling block. Well, actually there's a way around it. So, we put the public cloud in an on-prem incarnation for those customers and we try to work with that capability. So, you get the best of the automation toolkit, for example, from the public cloud providers, but the data and the servers are in the CSPs on premises.

[13:57] We have other limitations around security. Now, the telcos are effectively running the social and economic fabric all over the world, there is a requirement to make sure that these remain secure, reliable, and available. So, there's that notion coming from there. Again, the regulatory and the government pressures, but also from within the telco industry that maybe we need to pace ourselves a little bit before we move too fast into that environment. And finally, and this is more recent really, where we are starting to see the cost trade-offs playing a big role in the decision-making. There's a lot of applications that we can already move into the public cloud, and we are doing that. And you mentioned the DISH example there, but there are some applications which are very data hungry, and there the customers are finding maybe it's better to have that part of the solution hosted inside the CSP premises. So yeah, it's an evolving journey.

DR: [14:46] Well, is that because of egress costs that they're worried about?

Azfar: [14:49] Exactly that. And, sometimes unnecessary tromboning of the traffic going from one cloud to the other and back and so on and so forth.

DR: [14:56] Yeah. On egress, I always tell customers, "Why are you moving it back on-prem? Just leave it in the public cloud because that's where you're going to do all your data manipulations." You can do all these cool storage strategies where you put it into hot storage where it's accessible superfast, all the way to super cold. They always are like, "Yeah, why are we moving it back?" You mentioned there, moving some capabilities of the public cloud to private clouds. Are you using things like AWS Outposts and, I think the product at Azure is called Edge Zones? Is that what you guys are doing there?

Azfar: [15:27] And Google has their own solution as well.

DR: [15:29] They have Anthos.

Azfar:

[15:30] So yes, we are seeing some of those things. So, depends on which market around the world we are talking about. In the North American market, we are seeing a lot more interest in all of those edge solutions. In Europe, we are starting to see the initial deployments, those public clouds coming into the on-prem. There are very few cases right now. But again, the regulatory concerns combined with the economics will actually dictate the next few years on this particular topic. I don't think anybody can argue with the economies of scale of the public cloud providers for most applications, some of the barrier traffic that comes into the network, which can be in exabytes per day, that's a lot of traffic running through the infrastructure and that scares some of the customers around the world.

DR:

[16:14] I agree with you. Different parts of the world are moving at a different pace. But then, one person in a region or in a cluster of countries that are very similar, it's like wildfire. It, like, spreads. One person does it, and then they see that one person go for it, and then they all do it. That's been my experience in talking to telco executives. We were just out in the Middle East this last week, and we're starting to get telcos to say to us, "We want to use the public cloud. We don't think we can, but banks can use it. Why can't we?" Sometimes, it's just a matter of the research. They haven't really actually done the work to figure out that it is possible. There might be some work with a regulator, or some documentation to produce, or prove it's more secure, but it is possible.

[16:59] I keep seeing people wanting to move more and more every year. The line keeps moving of where we stop on moving things to the public cloud. And I think there is a line. Obviously, the tower's not going to move to the public cloud. We still need to have that on the ground. We still need that infrastructure. But every year it's moving more and more and people are seeing the benefits, so it's incredible. So, this has been such a great conversation, and I always like to end with something fun, and I guess this could be another difference between us. I recently vacationed in Hawaii on the big island. It's literally one of

my favorite places on earth. I heard that you hated Honolulu. And so, what was wrong with Honolulu?

Azfar: [17:38] So, this is in the year 2000.

DR: [17:39] Oh, a long time ago.

Azfar: [17:40] Yeah, long time ago. So, just arrived in Honolulu, very touristic, very crowded beaches. So, you go to your concierge, and we're like, "Is there a little bit quieter area?" And they said, "Well, not on this island. We'll have to go to Kauai." So, we took that small plane hop. Beautiful. And it was totally opposite to Honolulu. Very serene, could have the whole island to yourself. While we were there, we learned, actually, that's the island where Jurassic Park 2 was filmed. So we're like, "Oh, okay. That we didn't know, but great to be here." Absolutely loved it.

DR: [18:12] Yeah. The big island, which is where I like to go, is basically built from a volcano and the volcano is still active. And so, I took a helicopter ride over it, and you could literally see lava spewing. It was actually pretty amazing.

Azfar: [18:26] I mentioned I'm a physicist. hat's on my list because of the big telescope there.

DR: [18:31] Oh, for sure. I have not done that. But at night, even at the beach, if you can get away from the hotel lights, the sky is insane.

Azfar: [18:40] Amazing.

DR: [18:41] Yeah. Well, Azfar, this is such a great conversation learning what Nokia is doing and how they're thinking about the public cloud. So, thanks so much for coming on the podcast.

Azfar: [18:49] Thank you very much, Danielle. My pleasure to be here.

DR: [18:52] Stick around, because we're ending each podcast with a Telco in 20 takeaway. I have 20 seconds to tell you something you need to know.

[19:03] Nokia has been around since 1865, more than 150 years. They're older than I am. Holy shit. Actually, that's super impressive. With that much history, it's no surprise that they're reinventing themselves, especially with the changes that the public cloud and generative AI are bringing to telco. But whenever there's a massive technological shift, legacy vendors have two challenges they must work through. One, how aggressive to be in adopting the new technology. And two, how to bring the customers along for the ride. With the public cloud, you've got to decide how many cloud platforms you're going to support. You heard Azfar say that Nokia plans to support all platforms. That means they have to decide whether to have different code bases for each platform, or a common code base with the least amount of differences to support all the platforms. With different code bases, you get access to awesome databases and features from each cloud provider. But, you have to manage a shit-ton of code.

[20:03] On the other hand, with a common code base, you're forced to choose lowest common denominator technology, so you can have the least amount of code to manage. This means you pick a database because it works on all the platforms, not because it's the best database for that platform. It's a tough trade-off. On the customer side, you're investing in the future and want to bring your customers along with you, but they're moving at their own pace when it comes to adopting new technology. If they're moving slowly, your timeline for change gets dragged down, forcing you to support both your legacy technology while you migrate your code bases to the new tech. How do I know? I've been faced with these challenges myself. I was CEO of legacy charging software company, Optiva. The bottom line is, whichever approach you take, you need to have a lot of time and a lot of money to migrate a legacy code base and your customers to the new world.

[20:54] To learn more about moving to the public cloud and refactoring code bases, listen to my conversation with Forrest Brazeal, way back in episode 3, which feels like 150 years ago, and episode 47, Half-Measures with Shaun

Whalon from CSG. And while you're at it, don't forget to hit that follow button, share our podcast with your colleagues and leave us a five star review. Shoot me a DM on LinkedIn or X @TelcoDR. Sign up for my awesome email newsletter and check out our YouTube channel. It totally kicks butt. And finally, I'll be in Valencia, Spain, on October 23rd through the 25th, delivering the keynote speech at MVNO Nation Live. You don't want to miss it. Later, nerds.