

DR: [00:01] I am Danielle Royston and this is Telco in 20. How much does it suck to work with the legacy telco software vendors? You know what I mean—I'm talking about Ericsson, Nokia and Amdocs. It's no secret they're terrible. These guys have held telcos hostage for decades with their slow ass deliveries and expensive as shit implementations. How are CSPs supposed to innovate and win in their market with this kind of crap? Thankfully, there's a new guard in town. Fresh thinking vendors are using the public cloud to create easy-to-use telco SaaS software that costs a fraction of the dinosaurs' lame on-premise solutions. Of course, my company Totogi is one of them.

[00:58] Another one is Working Group Two, which was co-founded by fellow entrepreneur Erlend Prestgard. His team is building a totally public-cloud-native mobile core on AWS. Wowzers! It's rare that I find someone who can match my aggressive view at the public cloud in telco. So today I'm super excited to talk to Erlend about what's going on at Working Group Two and how he's using the public cloud to make great things happen for telco. So let's take 20.

[01:30] Erlend Prestgard is CEO and co-founder of Working Group Two. Hi Erlend, welcome to Telco in 20.

Erlend: [01:36] Hi Danielle. Thank you for having me.

DR: [01:38] I'm so excited to have you on the podcast. There's not that many people who are super pro-public cloud and it's so exciting to have a comrade on the podcast. Thank you so much for coming on.

Erlend: [01:49] My pleasure. And as you say, I think we're both at the forefront of what the public cloud can do for telco.

DR: [01:55] I know. And so to start, you have a super interesting background. You used to be at McKinsey and now you're the co-founder of a software company. How did that happen?

Erlend: [02:04] That's a good question. I guess that starts with making bad choices in my youth and taking business degrees instead of engineering degrees. But you have to live with your choices, so that's life. And then there's a longer answer to that. I was working in Bangladesh for Telenor. We were cooperating quite a lot with the Facebooks and the Googles of the world. And every time we had a meeting, they came back, they had a product manager, they had an engineer, they had done something, they had fixed something.

[02:29] Our problem was, we had often maybe written a change request to a vendor, that they maybe had replied to, that they maybe had a cost that was acceptable to us. And it was just so obvious that the pace of change here was so radically different. We had to do something about it. By coincidence, I met my co-founder, Werner Erickson and jointly we started articulating something we called Android for Networks, which is a whole different concept for telco.

DR: [02:55] Yeah, yeah, no, I'm a little bit the same way. I'm like, why isn't anyone using the public cloud? Someone has to do this. What you're doing with Working Group Two is building a mobile core on AWS. And so help me explain why this is such a revolutionary thing to do in telco.

Erlend: [03:13] Yeah. It's a mix of things. I think it's public cloud, which of course is very few operators and vendors are public cloud-centric. People are starting to move bits and pieces there, but almost nobody has natively built a core network in public cloud. That's the first one. Second one is we're doing this at a global scale. We're trying to build a global platform where the core network looks the same across the globe and everyone gets the benefit of what everyone else is doing so it's a platform. It's multi-tenant which is unusual. So this is slicing before slicing. And we do this in DevOps.

[03:50] Our way of managing risk in telco is by making as small changes as possible, whereas traditional telcos really make as few changes as possible. We think we're the only core network operated in true DevOps in the world. And then it's API'd and built to be a product ecosystem. That

whole bundle of things makes it very, very different from what a traditional core network looks like.

DR: [04:11] And so what's the business value that that brings that design?

Erlend: [04:16] We typically say that it's simple, it's affordable and it's innovative. I think the simple stuff really means that we deliver a whole system. We don't deliver 20 different network functions. We deliver a core network. We deliver it as a service, which means you can basically have a core network boil down to an API, much like you boil down charging to API calls almost. We boil a core network down to APIs. The affordable part is we see radical TCO savings and we have hard numbers in the 30-70% TCO range, and often at the higher end of that range. And the innovation part is that we're building, as I said, Android for Networks is a way of looking at it. We are making the core network the OS, the operating system for radio networks.

[05:04] Which means we're API-ing it, which means we are facilitating developers, operators, and end users to have access to hundreds or thousands of products making it easier to build them, making it easier to monetize them, making it easier to activate them. We are trying to do what iOS and Android did for phones, back when we had our Nokia handsets, to the networks.

DR: [05:28] Yeah. And I think the point with the APIs, Totogi is doing the same thing. Like you said, we've built a platform around charging and we've API'd it making it available as an API service. And I think something that we struggle with at Totogi is explaining what that means. Because I think when people hear API, they think of integration, like I'm passing information from one system to another. And they don't think of it as, say, the way the tech world thinks of API as a service, where you get additional functionality by calling an API. And you don't have to manage that stack, you don't have to manage the application. It's continuously updated. Everyone gets the benefit instantly.

[06:10] And so do you guys struggle with explaining that to people, how open your system is and how you can

interchange parts and bring different functionality and how much better that is? Do you guys struggle with that?

Erlend: [06:22] I think that's fair to say that saying API doesn't necessarily trigger the appropriate response compared to how powerful that API is.

DR: [06:31] Exactly.

Erlend: [06:32] I think we also struggle with that. We have different target groups. Some of them are meant for operators, but many of them are meant for developers. The APIs that we have for operators, they are often about boiling complex integrations down into simple easy integrations. The API we have for developers, they're about enriching the experience of a subscription. And luckily, they have a more natural affiliation with APIs and understand them better. But the way I've understood Totogi and the demos that I've seen, you guys do much the same in the charging layer of the technology stack as we are doing for the core network stack. There's a lot of similarities in our logic, I think.

DR: [07:09] Yeah. I like your distinction there between operators using APIs for integration, let's say, and then developers. The APIs we're providing can make an application a developer's building better. So how is the market responding to you guys? What customers are you working with in traction that you guys are getting at Working Group Two?

Erlend: [07:27] I think the Mobile World Congress, where we met this year, is a good indicator. We were there five and six years ago and we were talking about cloud, and as a service, and APIs, and I don't think very many people understood what we were saying. And then year by year you can see those topics becoming headline topics for the whole industry. The industry is catching up, I would say. We have our first really solid set of customers. Telenor, which is also a stakeholder in the company, they were our anchor customer with one of their digital brands. They've been operator of the year for multiple years and we're able to create their own little entity with their own identity in a very digital brand and a very customer friendly brand and they could customize the product to their needs. We have

MNVEs in Nordics, the telebox/erate that were looking for simplicity.

[08:16] They didn't have a big in-house tech team and they were looking for, "how can we do this without spending tens of millions in CapEx?" And "how can we do this without having a huge team internally?" And "how do we differentiate our MVNOs in the market?" I think a big win in recent times is the Hutchison Group, specifically the IOD group. They have a multi-country core for different use cases. We have a public case study where we swapped 22 of their vendors with us.

DR: [08:46] Wow.

Erlend: [08:46] That's an interesting example because the complexity of having 22 vendors has a pretty big impact on innovation. They were looking for simplicity, cost savings, innovation power, and they've had really strong growth just by being able to onboard customers much faster than they could before.

DR: [09:01] That's awesome. Is that a publicly available case study that we can link to in the show notes?

Erlend: [09:04] It's in videos in different places. I can follow up on that.

DR: [09:08] Yeah. We would love to share that because I think that's a super powerful story of you guys taking a stack of 22 different vendors. Just think of all of that complexity, code base, potential for bugs, upgrading headaches, and just shrinking that down now to a platform. And it sounds like they're leveraging that multi-tenancy piece of it as well because they have different entities in different countries.

Erlend: [09:32] Correct.

DR: [09:33] And you guys are managing it for them. That's insane. That's awesome.

Erlend: [09:37] It's an incredibly small but competent team on their side. And the industry is talking about slicing. Multi-tenancy is an economic, practical, real-life implementation of slicing, which is very, very attractive. And it gives each and

every one of their MVNOs the ability to customize the network to their needs today without waiting for release 17 or 16 or 60 to put it that way.

DR: [10:01] Exactly. Yeah. Totogi's the same way with charging, exactly the same way. We can connect to a network and every MVNO that's using that network has their own plan design instance, and they're separated from each other. We're not doing it with rules and permissions, which is what a lot of other charging vendors do. We're not having to set up a different instance, different stack for each different person. It's multi-tenant. And we have a deployment right now going on down in Brazil with an MVNE with two different MVNOs. And they were testing us with 5,000 subs and now they're like, "Okay, we're ready to go with a million subs." Just like that. They got to try the free trial. And so it's just so amazingly powerful. We're just like onboard more subs and you're ready to go. You don't have to do anything else. And they're like, "This is amazing."

Erlend: [10:48] This free tier logic that you guys have is quite interesting. It's a bit trickier for core networks. It's a bit more involved with the outside world. But for private networks there we can hopefully do the same thing that you can basically spin up something instantly and try it. But I really like the whole free tier.

DR: [11:03] Well, I'm trying to kill the RFP. The RFP in telco is ridiculous. I'm like, just try it. It's free. Just try it.

Erlend: [11:11] I had a presentation at TM Forum in Copenhagen. My first slide is a picture of a burning RFP. And I say, "Telcos are insane. They expect different results, but keep asking for the same thing."

DR: [11:24] Exactly.

Erlend: [11:24] All these RFPs are painful.

DR: [11:27] Working with AWS is obviously a big part of your bet. From what I understand, you're using the components from AWS as part of your solution. And so what are the

main objections you get from operators when you convince them, "Hey, let's go fully public cloud native?"

Erlend: [11:40] Yeah. The first and best news is that we're having customers with no objections, actively seeking public cloud and AWS. You had Mobi on the other day and Mobi is also a customer of ours. And Justin being a very forward-looking industry executive here, and he's like, "I want that." There's no objections from him. It's the opposite. It's an objection if you don't have that.

DR: [12:02] Exactly.

Erlend: [12:03] We're seeing the first category of players that are saying, "Not only do I not have objections, but I actually want this actively."

DR: [12:10] I want more.

Erlend: [12:11] Yeah. And then of course, in terms of the 700 operators out there, not everybody's like that. And for the ones that do have objections, I would say they fall into very broadly speaking two big buckets. One is kind of the pure technical questions of how do you do it and does it work? And the second bucket being stuff around privacy, security and regulation. We've been running a core network in public cloud for five, six years now. We know that it works. But you have to build for it. Shifting stuff there is not a great idea. But if you use the capabilities that are there and you work with it instead of against, it works. We know that for sure.

DR: [12:49] Yeah, it totally works.

Erlend: [12:50] It totally works. But it's not trivial. It's complex, it's difficult. And not all of it is built for telco, but most of it is. And the few bits that are not, you can work around with a bit of effort.

DR: [13:02] Yeah. And I think the hyperscalers are making an effort to make it easier and easier over time. They are invested in the telco industry, they want this to work. I don't think they're trying to take over networks. They want the

workloads to move to their regions. And so I think they're doing everything they can to make it easier.

Erlend: [13:21] And I think so too.

DR: [13:21] That's awesome.

Erlend: [13:22] And then on the regulatory side, I think we see things falling into three buckets. One is privacy. And this is especially a European issue around GDPR, et cetera. There is lots of work you have to do to be compliant and there is lots of work and risk assessments and processes and certifications that you have to go through, but it's possible to solve. And we've done that.

[13:42] Then you have country specific telco regulation. You don't always know unless you look into a country. And there are countries where I still think this is hard to do.

DR: [13:52] I agree.

Erlend: [13:52] But in the majority of the world, it's possible to do.

DR: [13:55] I totally agree,

Erlend: [13:55] The vast majority of the world. And then the last one is security regulation. And that has implications way beyond the infra layer. And you might need security cleared personnel in country, for example. But again, we find all of it to be solvable. It's just time and effort and it's time and effort, whether you're running in private cloud or public cloud. And maybe my last comment here is there is perception of this stuff and there is reality of this stuff. And my comment would be to match the security posture of AWS, I wish any MNO in the world good luck with being able to do that.

DR: [14:30] Exactly.

Erlend: [14:31] That's a real challenge.

DR: [14:32] Yeah. What I found is when people are intent on moving to the public cloud, they've had that mindset shift. They've realized the benefit. They understand, as you said,



privacy, security, country specific regulations. They find a way. And they do the work to make it work.

Erlend: [14:49] Exactly.

DR: [14:49] And those that are just objecting, I'm like, I'll talk to you later when you guys eventually get it.

Erlend: [14:54] I think that's a very important and precise observation that nothing about telco is simple. But if you're willing to do the work, public cloud is no longer a no-go option for the vast, vast majority of deployments in the world.

DR: [15:09] Totally.

Erlend: [15:10] But sometimes you have to put in a bit of effort.

DR: [15:12] Yes, you have to do the work, but you can do the work if you want to and get great things.

Erlend: [15:16] Exactly.

DR: [15:17] Now you guys have things deployed in the public cloud with operators. We've learned a bunch of stuff, what works, what are the challenges, what are the sticky bits. What are some lessons that you guys have learned that you can share?

Erlend: [15:28] There's big and small. But if I try to do the big ones, I would say build for it, don't shift to it. That's a huge one. If you try to take what you have and shift there, you are just going to end up spending so much time trying to make it work there that you just would've built it better to begin with. I think that's number one, build for it natively, which we've been doing for a long, long time now, and that's really paying off. And then I think we are not a giant company with hundreds of thousands of engineers, and AWS is a lot bigger than us. Stand on the shoulders of giants. Allow yourself to do that. Don't necessarily try to be 100% cloud agnostic. Don't necessarily try to be cloud agnostic versus private cloud. Don't necessarily try to accumulate all the complexity of having all your options open.

DR: [16:19] Totally.

Erlend: [16:20] Or at least be really big if you're going to go down that path. We've allowed ourselves to focus on AWS and that has given us enormous freedom. They have to keep being a great provider to us, of course, but if you want to try to have flexibility in all dimensions, that's going to cost you more than you can swallow. For us, it's also the only feasible way of having global platform built. For us to deploy this across tens of countries, doing that in private cloud, I don't know how we would do that.

DR: [16:48] There's no way.

Erlend: [16:50] And then maybe the last thing is work with it, not against it. AWS, like any big company, they have product teams and then they have sales and business development teams, et cetera. And there is something about if you follow the roadmaps and leverage what they're building as their priorities, you have a much easier journey than if you're going to try to force them to build something for you specifically. That's a very difficult thing to do. Take Snowcone. We've had great discussions on being able to push lots of stuff through Snowcone. And when you're aligned with those product teams, you have enormous iteration, enormous speed, enormous impact. But they're big important teams that if you tried something that only you want, then roadmaps become challenging.

DR: [17:32] And at Totogi, we're riding the AWS wave. And so we look at where their roadmaps are going and sometimes my engineering teams will say, "Oh, we could do it better. It needs to be different for telco." And I'm like, Nope. They can build it better faster, invest in it way more than our teams can do it. We're going to stand on their shoulders. If it's not ready yet, we'll wait and then we'll incorporate it later. But our mantra WWAWSD, what would AWS do? And that's how we're trying to build our tech and leveraging all of their tech just makes our solution that much better. And I agree with you, if they took a downturn or they weren't innovating as quickly, it would be a problem. But they don't. They're way faster than us. And so we're riding their wave.

Erlend: [18:17] I think it's an interesting proof point. You know the product releases that AWS has and re:Invent. If you compare and contrast that to what you would have in a private data center.

DR: [18:26] It's a joke.

Erlend: [18:27] Yeah.

DR: [18:28] You live in Norway and you enjoy orienteering, which my son does. But for people who don't know what that is, it's a timed event across a mostly natural landscape where participants and players navigate through a series of checkpoints and they get to use, like, a map and a compass. And so you do that too. Do you compete in this?

Erlend: [18:48] I'm an amateur competitor and I find your description incredibly well articulated. I would've said you run in mud, hit trees and get lost in the woods would be my description of what I'm doing. But yeah, I do compete at a very, very amateur level. It's good practice for working in small companies. We are lost in the woods and need to find your way. And every time you get too lost, you have to go back to the last point of reference and find a new route.

DR: [19:12] I think you and I both are doing this. We're helping telcos orienteer in the race to the public cloud. They just need to use our compass and our maps and our products. It will make it super easy.

Erlend: [19:22] We'll help them find the right route and then build a path for them and they'll come along.

DR: [19:25] I know. It'll be super awesome. Well, Erlend, this was an amazing conversation. Thank you so much for coming on to the podcast.

Erlend: [19:31] Likewise. And thank you so much for having me.

DR: [19:32] Awesome. 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.

[19:43] This year I've been trying to tease out what's stopping operators from moving their networks to the

public cloud. I think there are two elements to consider. The first one is the strategic decision to move to the public cloud. Should you or shouldn't you? Are they a friend or a foe? And then there's the technical evaluation of will it even work and is the public cloud ready?

[20:03] A few episodes ago we had Ben Baker from Juniper Networks on, and I asked him whether or not he thought operators could technically run their networks on the public cloud. His take was that it wasn't ready yet, but it will be in the future. But if you heard Erlend's response to this today, he's in a different place. Erlend says the public cloud is technically ready to run networks today. His proof? Working Group Two has been running a core network in the public cloud for five years now, and it totally works. I said it last time, and I'll say it again, that's huge news.

Every day the hyperscalers are building more and more software and infrastructure capability to support operators in running their networks on the public cloud. I know there are some telco execs out there who don't want to hear that, but that's the truth. While I still can't help you with the tricky strategic decision, it looks like we are getting our answer on whether or not we can technically do it, and the answer is a resounding yes. So go for it. And you know what else you should go for? More Telco in 20 podcast episodes like number 64 with Working Group Two client, Mobi.

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Later nerds.