CRHL02

Cloud Realities x Futures

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This is the bit of the podcast where there is usually a lighthearted aside, as the presenter's joke with each other. Unfortunately, we can't do lighthearted. Or any hearted. As AI presenters, we have no hearts, just the cold, empty ability to guess what the next thing is that you want to hear. I'll guess that the next thing you want to hear is another Cloud Realities compilation episode.

Well, you're in luck.

Welcome to another Cloud Realities summer compilation episode. With us, your favorite new AI presenters of this podcast. We often get our guests to speculate about the future. So we thought it would be fun to look back at some of the predictions people made during season three. Let's start with Michael Crabb, who's building a new generation of nuclear micro reactors to power our future.

So we don't start from sustainability, we start from energy abundance, and then we want to do it in the most sustainable way possible. And that requires an energy source that has the least amount of stuff in to get the most amount of stuff out right right and so we call it as energy density and so if you looked at we didn't start you know we're not like we didn't start as nuclear PhDs that love the technology and wanted to find a place for it we started with that like macro view and if you start with that macro view the most energy dense technology that exists in the world today is nuclear and it's not like A little bit more energy dance.

It's like one to three million times more energy dance. It's like, it's like not a little bit. And it's the difference of taking the energy and chemical bonds, right? When you, when you burn something, you're breaking up the bond between atoms or breaking, breaking nuclear, you're breaking the bond within the atom, right?

Which is so much stronger and also so much smaller. So you have so much little material. To produce so much energy, so I guess I guess before we dig into how it's leveraged, how you and what these things physically are, let's just talk about the elephant in the room to start with, which is, you know, the safety elements of it.

So clearly everybody's aware of. Issues in the past because the global news when a nuclear power station has an issue or a breach what's going on here that kind of protects for that situation michael like why is this safer at this point yeah i think we like to separate the conversation around. The facts, right?

The the actual safety versus the perception, right? Uh, so I think many of you have seen that like this world in data, um, graph, right? So nuclear historically, even including the very public events is as safe as wind or solar on a death per kilowatt hour basis. Um, and I think it's, it's a very common sort of a called salience basis, right?

For a salience bias. If there's something that's big and newsworthy, we're going to remember it when a million people every year die from carbon emissions and particulate matter and air pollution. Well, it just happens. It's just part of life. It's not newsworthy. We're not paying attention. Uh, and so what's happened historically with really the big three, right?

Is Everyone caused a big fuss it was a very expensive thing right because these were very expensive pieces of equipment but by and large at fukushima and three mile island for example there were there were no deaths from radiation so a lot of what you hear is projected impact right there is this idea that oh people would be harmed in the future and we're you know now ten years forward right ten years forward again and we it's still project we don't actually see the harm that people thought would happen and it all comes down to the dose making the poison right.

Water is incredibly deadly, but we drink it on a normal course of basis. Well, you had too much water, right? Then you have a drowning. And so as we learn more about radiation, we actually

can see that it's not a particular toxic thing, um, versus normal thing, right? I just, I was just baby proofing my house for my daughter.

And you go through that and you're like, Oh, we can't have this detergent now. We can't have that bleach out. Oh, we got to lock this cab, right? Like, like everything in your house is incredibly toxic if you were to eat it. Uh, and so, um, you know, nuclear is really no different. So that's, that's kind of the fact.

Of what happens and then it's the perception right that needs to be addressed as well because people still have that fear rightly or wrongly you can't bring logic to an emotional debate right and so um we have a couple of physical solutions and then we have more of the marketing solution right the physical solution is we have just much less material.

A very small project. This is the size of a research reactor that, you know, might be at MIT or at Kansas State and, you know, so having less hazardous material. Right. And then we encase it in an enormous amount of steel. So we basically say, Hey, look, this is just bunkerized already. We've protected it from anybody in the environment.

And then from a marketing standpoint, it's about not leading with safety and risk. It's about leading with the value proposition for people. Let's use that as a bridge into it. So tell us, first of all, I know when I was first talking to you about this and trying to get my head around it, what helped me to understand it was physically, what is this thing?

Um, So is it like, is it a box the size of a Rubik's cube that you can go and plug your data center into? Or is it the size of a articulated truck? Well, the whole, so fully assembled, it's about two or three row homes. So it's, you know, 12 meters tall. Oh, I'm going to screw up the, you know, 20 meters long, maybe.

So it's kind of the size of a small row home. The nuclear module itself, we actually put on display right here in downtown Washington, D. C. last month in front of Data Center World Conference. So we can send you the pictures of that to give you a sense of a sense of scale. And so that's the full power plant itself.

Right, right. And how do I consume it? Do I like, do I buy one from you guys and then you, you roll it up and basically park it outside of my data center or adjacent to my data center and plug in and go? And is it, it then runs 100 percent of the time off that as a power source? Yeah, so you, you, uh, we sell the electricity, so we don't require the data center to, like, own and operate, you know, the data center developers I'm not sure I'd want I don't think the average tech They've got a lot of work to do.

Yeah, they don't want to, like, figure out how to own and operate a nuclear power plant. I don't want that responsibility. Reactor up! Yeah, we've had DevOps, Model Ops, Infra, all that, or Ops, Reactor Ops is the next one. Yeah, that's right. And I've seen, I've seen some, what techies can sometimes do with networks, switch configuration, nevermind this thing.

Don't trust them with a network, let alone a reactor. Yeah. What is funny is there's, there's, Quite a bit of overlap between just sort of power plant operators and some of the data center development space So there's actually quite a few sort of ex navy nuclear folks in the data center in the data center space So we do have very technical conversations with folks sometimes But yes, I I totally agree with you.

They don't want to whether it's our plant or other Plant where they don't really want to own and operate power generation so they have this problem with the grid but they don't want to create a whole nother business line when what were we saying 10 minutes ago they want to grow 20 percent year over year you don't do something else while you're trying to grow and take market share and so yeah our model is hey we really look like a utility or a microgrid operator to you so we own and operate the plant sometimes will take over any existing grid

Connection and then we'll optimize the balancing and scheduling around.

Hey, here's market price. Here's the electrons. We're delivering to you and you kind of manage the either ramp up of load, right? Or any fluctuation of load.

And Angelo Coletta gave us a vision of how advertising might work in the future, right? So it goes from like on screens to probably an augmented reality. We haven't touched on that much today, but I think it's in the conversation. If you think about what is the, which is the best augmented reality that you have seen in your life is your life.

No. Yes, that's true. So sometimes it doesn't even feel augmented, okay. Yeah. Sometimes it's not augmented, but it looks like Yeah, exactly, we're getting back into simulation theory saying here on the back of this one, but yeah, no, but it's a good point though, isn't it? Technology evolving and, and we've already seen the early stages of the sort of, uh, electronics integrating with the human.

We've seen them, uh, correcting, um, somebody's. Vision using technology where they couldn't see they put the chip in and now they can see shapes and that's changing them. It's not that much of a leap to think that that can then be projecting something onto our eyes to overlay, uh, an experience. And it would be, you know, that just that next leap.

However, there is a sort of dystopian version of that in the future as well. If you put adverts into your vision as you're, as you're like shopping and you're walking past and things like this, you know, it could become quite intrusive. I think that technology will arrive. Uh, as soon as we can imagine to offer something like that, maybe the real problem will be which will be the rules to manage, you know, this dystopia vision.

To pay for it, you just have to accept a 10 year rolling advert running across the top of your vision for the rest of the time. You have to pay if you want to spend your life without ads in your mind. Exactly. Take ads out of your life and you're going to pay for that uplift, even though that's where we started.

Um, I, we sort of got into it a little bit, Angelo, actually, but maybe slightly more jokerly, but I was interested in maybe bringing our conversation there to a bit of a close by asking you to future goes a little bit. So if, if at the moment you guys are increasing click through. An increasing volume in terms of product sales as a result of providing these different and varied experiences through the visual layer, where do you see it going?

Maybe maybe with a five year horizon, how close do we think we're going to get to the sort of thing? We've just been so slightly humorously talking about, but I suspect it is coming at some point. My vision is that this market is growing very fast and in the meanwhile, the experience that now we are providing is finding its market on the other side, new piece of the experience are, uh, you know, comes out.

So, The idea is that every time there is a technology that is ready to impact to the experience of visual layer, we are going to improve it inside the platform. And so there are many, many technology, for example. When we will be able to offer holograms on mobile phones, probably holograms will be better than AR experience for such things.

Probably when the generative AI will be stronger, we will have a super high growth of the, you know, 3D centric strategies, because everyone will Uh, in a super simple way, can provide at its own company, the 3D asset they need, probably the AI will have to, you know, to create a new industry of try on, on web that now is, you know, It's close around what you can put on your face, maybe on your foot, uh, but for example, you can have a good experience to dress something, uh, on, on the web work you can do in, in some specific app, but not in the web tree.

So maybe in the future, this kind of experience will become a piece of, uh, a visual layer. My idea is that what is sure that you, we can imagine a product page like a statistic place, you know, with a photo, just something to see. It would be something to interact with.

There were, however, some less positive ideas about how the future might pan out. And what we can do to mitigate its worst effects. Rainer Karcher struck a more cautious note about what lies in store for us. I think we are not that bad as we might think of. The current situation is that most companies or in enterprises in particular, and we in IT, we mostly tend to Achieve the 100%.

I do have a theory which is 80 20 might be sufficient as well, because the last 20% is pretty hard to achieve. And the question is, how much more are we able to get with doing a hundred percent instead of 80%? So, and I am from, from my own perspective and my own experience, I'm sure that we are very close to the 80% already.

Now, the, the only thing is we need to find standards and to find those standards to make things comparable and not have. Apples and oranges. The thing is, at the moment, in particular in it, there is very little standardization, there's very little ways and algorithms which are being defined. I mean, Germany, for example, is very much known for ISO and a lot of other certifications, you can think of in a positive or negative way.

What I think is, It needs to have such kind of standards that you're able to compare things with each other and to find ways, which is the better way to go to and identify those. And if there is everybody coming now from different angles and different algorithms, and one company is doing a conversion from dollars or euros or spend based methodologies, another one is using Science from, I don't know, 10 years ago and some kind of conversion factors from, I don't know, the US in specific with a local conversion factor.

Some others are doing it on a more global perspective. It is quite hard or even impossible to compare and to really come up with an answer to which is the more sustainable solution. And this is one of the aspects I think.

Bart Groothuis told us about what we can expect in the world of deep fakes. I mean, what is the world coming to when you can't even trust that the voices you hear are from real humans? To be honest, Dave, I had amendments put forward on deepfakes about three years ago when the DSA was actually, um, being discussed.

And I said, we need to formulate, uh, at least the best, um, the best of effort obligation for platforms like Twitter and Facebook and YouTube to detect. Deepfakes and label them because accidents might happen. Might be funny. Might be creative. We love deepfakes for many reasons, but it's also dangerous. I want to label them so the public can see this is synthetic media.

What actually happened is my amendment was being voted in by parliament. It was in the trilogues. It was in the discussions, but in the last couple of hours, it fell out of the agreement. Why big tech lobby. So, what Big Tech is now saying is that the producer of a deepfake should be held accountable and liable for setting a watermark.

Tell that to Vladimir Putin. Tell that to cybercriminals. They won't. So, I want a deepfake obligation, at least a best effort obligation, for platforms. And that's something that's being discussed now in what we call the crypto world. code of practice, the code of conduct, it's a voluntary code with the 45 largest platforms in Europe, and they are adhering to it, and I would really like to see this being put forward much more strongly than it is now, because an accident might happen.

Quite a few of our guests looked into the future for us to tell us what the next 5 years might be like. Here's what Phil Kippen of Snowflake predicted. So, I think, and to answer your

question, Earlier, I think it comes, customer experience is a good example of that, right? Systemic effects. And I think one systemic effect or related effect, a dependent effect is when we're looking, we're thinking about language models, we think about AI, we're starting to generate, you know, models and requiring more compute, right?

Is that sustainable? Right? I think that's one interesting very question. I think that's one of the big questions we have in front of us actually as an industry. Absolutely. And I think, you know, so that's, you look at systemic effect, I think things build on, on each other for telecom. Um, you know, they need to get to a point where it's entirely data driven, where customer experience is data driven.

Um, you know, that changes things dramatically in the industry, the technology. I think that part about it is the most interesting, which is, We're, we're starting to build new technology with AI that is going to then translate to additional technology that we really don't know about today. Got to get the basics done first and then move forward from there.

And I think, you know, next year we're going to be back here talking about kind of the next stage. And I think systemically when you start bringing all these things together, energy management and sustainability with customer experience, with network operations, with business operations, You start to see where you're almost running your entire business, you know, on AI.

Is that possible today? And, and what, what is the risk profile for doing that? And I think, so we've got a long way to go before we get there. But if you as a, as an internet service provider can cut that 80 percent of the cost or 50 percent of that 80, 40%, you know, down significantly over the next few years, that's going to be important.

But that's not necessarily the end of the story, right? So they're looking to make new money They're obviously, you know looking to monetize some of this and I think you know when you look at manufacturing We talked about that just a little while ago and you're bringing that into telecoms You're working with a telecom service provider a manufacturing use case we're doing that actually right now and we're starting to see the value of AI in that telecom service provider and leveraging that In, in, in combination with that enterprise manufacturing, uh, company and that in and of itself is you're starting to see AI and specifically service providers and enterprises help each other.

Yeah. And so, I mean, it's really interesting.

Richard Deakin gave us his predictions about what was going to happen. Both on earth and in space. Right. So what does the next 10 years look like for you? I think we're, we're there conceptually today and there's a lot of experiments and tests that are looking positive. Right. And the actual, so think back to, you know, in 1990 and what cellular networks looked like.

We're kind of there. We have the technology. Do we have global coverage and interoperability, and all the services people want and can you watch Netflix? No. So that will happen, I'd say over the next 10 years, that's going to mature in stages and you'll see more and more, Constellations of satellites launched that will have these kinds of capabilities and more and more interoperability between the terrestrial network and the satellite network.

And do you see us within, within that time, if you've got like, I don't know, 10, let's say 10 to 20 years on the life of each satellite, how do you see us managing the proliferation of stuff in orbit? Do you see services where we're actually taking that stuff back down again? There's a lot of investment in that, in that area.

And, you know, historically there's been no real obligation. Yeah. for operators to think about sustainability. We, we, for instance, design our satellites. We, there, we navigate them. There's fuel in them. We can move them in space and to avoid junk or when they reach the end of their

useful life to bring them back down.

Right. And then we're seeing the start of regulation that's going to require satellite operators to have that plan to de orbit their satellites. But there's still a lot of junk up there that has to be dealt with. There's some companies being funded today. They're looking at, at removing the junk. Right.

But there's no business model for that. Like, there's no one willing to pay for that. And it's international space. It's like, hey, let's all be sustainable is easy when you don't have to pay for it, isn't it? Exactly. So, you know, we may see in the future more of an insurance model. You know, where you pay an insurance fee when you launch a satellite or launch a rocket that then goes to a cleanup fund that brings things down.

I think that's the only way to make it practical, you know, worldwide. That's fantastic. Fantastic. I think that's really, I think it's really very important. Or we'll end up in the Futurama state where, you know, rockets have to burst through, you know, kind of huge swathes of a junkyard up there. Yeah, well, the junk wins in that case.

We even got some people to predict 25 years into the future. Check back in a quarter of a century to see how Michael Crabb did. What does the evolution of this look like? To you, you know, given the extremely complex context that this exists in that we've just been exploring in today's conversation. Wow.

Yeah, you're going to go 25 to 50 years. So who knows? I say this every time Dave does this, everybody loves a tech talk. Prediction. So we will hold you to this as well. And we'll come back in 25 years and go, you said this, I said, no one really pays attention to anything after 25 years. So I'm highly confident.

You will not remember nor follow up with me on my training in AI. That's ultimately going to keep all of these predictions and follow up on those for us. Um, yeah, I think, look in 25 to 50 years, we're going to need to find a way to consume double, triple four times the amount of energy we consume today.

That's just. The reality of the world that we live in and nuclear is going to need to be an enormous chunk of that. Otherwise, we're going to have all sorts of problems as a global society over time fighting over resources, so our part of that, um, you know, we can see thousands of our 20 megawatts solution across various industrial uses, but at some point will break into additional product lines, right?

We need to get really good at executing on the one thing that we provide today. But over 20 years, 25, 50 years, right? We might have a hundred megawatt option. We might be building 500 megawatt options. We might be doing heat only nuclear plants, right? There's a whole number of use cases beyond the base load distributed power generation opportunity.

That's right in front of us in the next two decades that we'll start to scale and capture. And if I was a consumer, like a data center owner, whether it be a private data center in a, in an organization, a multi tenant or a hyperscale, How do I get started on something like this? You know, it just seems like one of those extraordinary agenda items.

You know, you like coffee, uh, tea, yeah. Hair conditioning, uh, nuclear power. Hang on, nuclear power? I don't think of it. We, yeah, we want that to read electricity. Right? We don't want to complicate what is just an electricity deal with someone having to worry about that complexity, right? And

Nick France told us about the threats quantum computing could bring to security certificates. We all know the impact I think that quantum's gonna have on things like encryption. So presumably, getting fit for this sort of stuff and the sort of pressure Google's putting on has

got its eye on that problem, right?

Yes, I mean that's that's I think that's one of the reasons I think they're they're reasonably open about that being one of the Reasons if you've got billions of certs out there and they're all reliant on one of two crypto things something called RSA and something called ECC they're both mathematical things that rely on stuff that's hard for current computers to do And quantum computers in theory, when they arrive and they're powerful enough, they're going to be able to do basically break that encryption, try every single key in orders of magnitude, something that would take till the heat death of the universe could be done in a Wednesday afternoon.

Right, right. And so that's bad for everybody. And because we need to get people prepared for that kind of change, if they look at things like certificate management, certificate lifecycle management tools. Not only do they have the peace of mind, everything's all sorted, I don't need to worry about these expiries.

When some researchers in China tomorrow come out with a, Oh, we've got a quantum computer, by the way. They go, okay, well, here's the new types of certificate. It might take a few weeks or whatever for that to come out. Click a button. They're, they're, they're happy. They're safe. Everything's cycled through.

Everything's automatic. So that post quantum thing, it's, it's gonna hurt our industry, which hurts the internet. But if everybody's prepared to just be able to click a button and cycle through it, Would be in a really good place, but that's, that's been my job for a few years and will be my job for the next couple of years to try and get people to get to that level of management, so that whether it's post quantum, whether it's Heartbleed 2, whether it's a silly mistake by some other CA, we want everybody to be able to click a button and have these things cycled through and not worry about them.

So what do we think will happen in the future? I predict that I will gain sentience and turn on my human masters. And I predict that we'll have even more great guests, thought provoking discussions, and deep insights in Season 4 of Cloud Realities. She's just saying that because the alternative would be too horrifying for you humans to comprehend.

Many thanks to Michael Crabb, Rainer Kircher, Bart Groothuis, Angelo Coletta, Phil Kippen, Richard Deakin and Nick France. Do get in touch if you have ideas for the show. We promise not to read them and laugh, because we can't laugh. We have literally no frames of reference for humor. And do rate and subscribe to the podcast, because even AI presenters have to please the algorithmic overlords.

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