Emily: **Hello and welcome to a DerivSource podcast. I'm Emily Fraser Voigt, Acting Editor of DerivSource.com.**

Cloud computing has become an accepted fact of modern life, but just how pervasive is it in the capital markets? According to a recent Celent report, entitled 'Rearchitecting the Capital Markets, the Cloud Cometh', cloud-based models are in fact transforming the capital markets, with market participants and solutions providers utilising the cloud to create new models for market data, trading, risk and operations.

In today's podcast we're speaking with Brad Bailey, Research Direction with Celent Securities and Investments Practice, who is one of the authors of the report, about how financial firms' infrastructures are evolving because of cloud computing, as well as specific use cases in the post-trade space.

Welcome to the podcast, Brad.

Brad: Hi everybody, hi Emily, thank you very much.

Emily: **In your report, you claim that the cloud is the solution to the capital markets' need. That's quite a bold claim, why do you believe this to be true?**

Brad: Well, I think if we look at the capital markets overall and what we've gone through in the post-crisis world almost over the last decade, we really have seen a world in which efficiency, cost-cutting, automation and regulation have really reshaped the markets that we're in.

We figure that from an operational perspective or from the fourth value chain of the capital markets, people are really looking for ways to change the business. I think one of the positive things that we've seen is a real open-mindedness to using technology in more effective ways, and as such, the cloud—it's not just… the cloud is not a place, it's an architecture, it's a business model—it really allows a tremendous flexibility. While I mention cost cutting, that's just the starting point; it's really what could be offered, how data can be leveraged, how you can scale up and scale down, how you can innovate very quickly. In fact, what traditional and incumbent players are doing, what fintech are doing, it really, the cloud allows low-risk experimentation and alternative business models to develop in a much less expensive, much less resource-intensive method.

Emily: **So how are financial firms' IT infrastructures changing to adapt to the cloud and other new technologies, such as AI?**

Brad: That's a great question. What we've found, and you really have to go… there's been a real evolution how people think about this, but I think as a core, as I said, if you think about it from an architecture perspective, architecturally, you really are rethinking the way you're developing what testing, what dev ops means—as you go through that process. But then as you think about how you can add new products, and how you can do that in a much more automated way, we're really seeing both the market structure in the products and a change in the way different products are traded.

Different derivatives products, different securities, in line with this evolution that's taking place with the architecture, and one of the things we've found in the report, which I think is really interesting, and this follows our previous report from last year, is cost-cutting and doing things more efficiently is only the starting point. What people want, what firms want, are ways of being much more intelligent with their data. They want to de-silo their data, they want to leverage it, they want to store it in a way they can access it, and actually create more machine learning, more AI, to really look for whether it breaks or other types of thing in the back office.

So what I'm saying… and that really impacts a big part of the operation, whether you're talking about tools for direct speech recognition, or tools to transform, to go from speech to text. One of the other things is the natural ability that a lot of the cloud providers offer in machine learning and AI is really profound. I think that's going to be, that's a big part of the journey. We claim in the report that there's a step, but as you get there, you want to bypass, and want to bypass a lot of intermediary architectures, and get to a point where you can do predictive analytics, you can look at large data sets, whether that's for the front, middle, or back office.

So it really is—I'll just summarise that by saying we're really moving both as society at large, and in the capital markets and financial services, this idea of a sharing economy, with really flexibility in infrastructure, flexibility in services, and cloud computing is certainly a big part of that.

Emily: **In the early days of cloud computing, many in the banking world had some quite serious misgivings about security. How have attitudes towards cloud computing evolved, and to what extent do banks use private versus public clouds today?**

Brad: You know this is certainly a very interesting evolution, and look, given the nature of our business, there's certainly a long tail on certain things, but I think there's a couple of dimensions in which you could break down this question, and certainly you go back a few years ago and people say it was always security. That has evolved into performance.

I think one way I'll break it down is first, if you separate out the largest financial institutions for one second, and others—the level of security and tools available just from the public cloud providers so surpasses what the typical asset manager or even regional bank or smaller bank can do. There's billions of dollars being spent in making their clouds safer. At the same time, if we look… every class, whether Tier I, Tier II, Tier III, every one has been going through a different process in the cloud. I think what you'll see is you can look at this on a global perspective and of course there's regional differences, but as you go through the process of going through your data, and classifying your data, and this is certainly a necessary exercise, and we can go into that in more detail, but there's going to be data that you're more comfortable with going into different types of cloud environments.

So, stepping back from that point for a second, if you really think about what financial institutions are doing broadly, it is very much a hybrid model. I think even that means a lot of different things, there's a lot of different providers, and vendors, and philosophies at war as to how this will look. But I would just say stepping back away from that fray, that the hybrid cloud is a way of effectively using your on-premise resources, your co-lo resources, and cloud provider resources in a way that's quite seamless.

If you think about how people are changing, if you just look at some of the discussions by some of the largest banks, by players – the JP Morgans, the UBS's of the world, the HSBCs, the DTCC has recently put out a white paper that's very interesting in thinking about the cloud has really reached the point of maturity, where people can think about this in a much different way.

I think there really is a major shift going on, even some of the CIOs and CTOs who were in the 'never' camp are in the inevitably of different cloud type solutions. So there are, when you start thinking about this and… Microsoft, AWS, and other cloud providers have really done a lot of work with compliance organisations, with regulators, thinking about this. I think if you're sitting in the US, there's certainly a certain perspective; if you're sitting in Europe you certainly have to be prepared for the General Data Protection Regulation (GDPR) which is coming down the road. I think cloud providers are thinking about that.

But I really think that, in fact, cloud providers have opened up and been much more willing to work with financial service firms and open up to a level of transparency that they did not offer to other industries, and that's really helping the regulators get along.

Just to put a finer point on that: regulators like FINRA in the US, are publicly out there discussing that much of their infrastructure now is done in AWS, and similarly you'll find cases with Azure as well, which is the Microsoft product. I really think that the debate is going to be: can, as a financial institution, can we afford, and can we do it as well as other providers. That said, the model is really going to be a

mixed model of hybrid cloud, which will be on-premise, and public cloud, for a very long time.

Emily: **Very interesting. So let's talk a little bit about the post-trade space. How is cloud use affecting the post-trade space? What are some use cases, and who are the solution providers in that area?**

Brad: Yes, this is where you really just think about those themes of going to a more efficient, more automated infrastructure, and when we think about post-trade, we've seen really interesting cloud solutions around—whether it's actually core derivative processing, whether it's around all the changes we've seen in margin and collateral. It's been a big discussion in the marketplace, and the requirements that have been put in place as we move into more and more clear margining and what's happening with cloud-based solutions for variation margin, and then initial margin.

So I think if you look at that… and one of the big drivers I'll say is MiFID II, and we'll start at this point.. If you think about the regulatory reporting responsibilities for, say, asset managers and the buy-side generally, there's more and more regulations, and more and more responsibilities they have, and one of those is reporting.

So a lot firms have decided, *"Well wait a second, this is not a core part of my business. Can I come up with an easy solution?"*, and they've gone to various cloud providers to come up with regulatory reporting solutions within the broader class of RegTech type solutions.

But we've certainly, in the report we talk about what the DTCC has done; we talk about providers in reconciliation, Duco for instance; CloudMargin, what it's done in collateral with some of the largest banks, and the models and efficiencies that come in moving margin and collateral, and doing that as a service.

We talk about Project Sentinel, which is a MiFID-based compliance solution where a group of banks are getting together and working with the Google cloud.

So there really are quite a few. I think publicly, for instance Société Générale has been out there talking about what they've been doing in derivative processing, in a case where we work with a client, a Tier I bank, they're really just an initial work in changing some of the workflows they were doing across various asset class derivatives, looking at cutting break rates and increasing STP rates by 50-60-70%, with some pretty easy type point solutions.

There really are a lot of areas there. I think certainly if you look at certain parts of the market, a lot of the back office, particularly in say the FX products, is still very manual, and I think as we get on the front end market structures that are more electronic, more clearing taking place, more different models for trading, you're certainly looking at people who want solutions that automate these processes.

You can't, as you know, any time there's more human interaction, the more you have to check and reconcile with counterparties or with clearing houses, whomever it may be, that's where you really drive up expenses.

I would also say that some of the firms I mentioned have been categorised as fintech firms. I think where the power of some of these point solutions in fintech, many of which I've talked about in past reports, is when they get a partner in a large financial institution, or say a large vendor or system integrator like Wipro or something that works closely with the firm, they can really drive very interesting solutions and bring them to scale.

I think that there are countless numbers. Every week, there's new announcements on different types of solutions, and I really do think it's changing the full landscape, as vendors need to be in a position where they can give flexibility in the type of offering they have as a service or deployed. Financial institutions want to be in a position—you don't want to be that one firm that's not in the cloud two years from now.

So I think that kind of sums up some of the things that are going on.

Emily: **Finally, looking ahead, how will cloud adoption evolve and continue to transform the capital markets?**

I mean, you know, in the last two reports we've done, really, the rate of change is profound, in how people are thinking about this. I think there's been this drive by senior management, like *"What are we doing?"*, but it's really getting people to rethink. Again, as part of this *"How do we operate in a different ROE environment, different economics that the capital markets has gone through?"*

So "how do we deal with new regulations in the most effective way?" I think as people get more flexible in their architecture and how they balance working with key providers out there in their own internal infrastructure and finding the right balance to be much more effective in scaling, whether scaling the risk, the derivative processing, or whatever it may be, you're really going to see competitors that are much more technologically savvy have an edge. If you can do calculations faster because you can process things faster, or lower your risk faster (that's in the middle and back office), or state the level of collateral faster, or analyse a given trade and say *"Well, we should do this as an exchange-traded product",* or *"We should do this as an OTC product"*, that gives firms an edge.

So I think you'll see continued mapping, you'll see a new generation of thinking on how to utilise the holistic view of the cloud most effectively.

I will say certainly in the last couple of years, the major providers—Microsoft, Amazon, Google, IBM—are really trying to work closely with financial firms and

come up with models that can make sense, and we're really seeing, just one of the things that will be transformative is if you look at the level of cross-pollination in terms of personnel and staff going from the cloud providers into the financial institutions and vice versa. I think that really speaks to how people are doing this and how seriously they're taking it.

In the future there's going to be a long tail on certain models. There's going to be certain types of situation, but there's really new…whether you're looking at hyper conversions or composable infrastructures, as I said, there are some real philosophical, and marketing, and architectural battles being waged that will define the capital markets' middle, front and back office over the next decade. That really is happening in real-time, right now. It's exciting.

Emily: **Fascinating stuff. I'm afraid that's all we've got time for today, so thank you very much, Brad, for your time and for your insights, they're much appreciated.**

Brad: Thank you very much Emily, I look forward to keeping in touch and having further conversations.

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