Content delivery networks return to the edge

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Akamai Technology's announcement that it plans to embed edge compute into hundreds of its content delivery network (CDN) nodes is a significant moment in the evolution of the interconnect edge. For the last 10 years, CDN providers have been retreating from expansion of the interconnect edge, as they centralised operations to cut costs and remain competitive in the high-volume low-margin streaming market. Akamai, the market leader in content delivery with over 4000 CDN nodes worldwide, is now saying it wants to go the other way and embed compute in hard-to-reach locations that are underserved by public cloud providers. Ever since it bought Linode 2 years ago, Akamai has been building up its edge computing proposition, but this announcement takes it to a different level. We expect other CDN operators to take notice and follow its example, which will change the overall direction of the CDN market and hence the interconnect edge.

Akamai's edge ambitions will put it in direct competition with one of its biggest partners, AWS

Akamai's Project Gecko, which will insert cloud compute into Akamai's CDN nodes to create what Akamai claims will be the world's largest distributed edge cloud platform, is a direct challenge to public cloud providers' activities at the edge and particularly to AWS. This move will have consequences. Public cloud providers (PCPs) and CDN providers (particularly Akamai) have worked closely together and most of the major content producers are customers of both companies. It is common for media and software companies to use AWS as an origin server and Akamai for distribution to end users. Akamai has much greater egress capacity than even AWS, which makes its technology useful for handling spiky traffic from sporting and other events. However, the increase in the importance of the edge is bringing Akamai and AWS into direct competition. Akamai makes no secret that it wants to win large enterprise customers from PCPs and it is planning to locate edge compute nodes in hard-to-reach locations where public clouds do not have a concentrated presence. In doing so, it is pitching itself against a competitor with large resources and the patience to stick with a long-term strategy even if it is not immediately successful.

The approaches of the two providers when it comes to edge are quite different. AWS operates at the metro edge and its edge services are deliberately designed to be extensions of its central cloud. This means that customers can 'code once, deploy anywhere', but it is a cloud-out architecture rather than the edge-native approach that will be needed to support next-generation applications such as autonomous vehicles. Akamai on the other hand is operating at the interconnect edge, an inherently more diverse, multi-network environment. We do not know the full details of Akamai's Gecko architecture yet, but it appears that it will be more autonomous, distributed and edge-native than PCP metro edge nodes. It will be interesting to see how AWS responds to this competitive threat. AWS has a short product development cycle and will produce something new and soon if it is, or feels it might be, losing business to Akamai.

Second-generation CDN providers such as Cloudflare and Fastly will also have to re-think their strategies

Akamai's edge plans will also give grounds for concern to competitors in the CDN market. The rise of second-generation CDNs like Cloudflare and Fastly has put Akamai at a disadvantage for the last 10 years, but the rise of edge compute has revealed gaps in their models, presenting an opportunity for Akamai, which the latter is grasping. Cloudflare and Fastly centralised their CDNs and use a superPOP model. A superPOP model centralises services to one location as much as possible, with one or two nodes serving a whole country, or even larger geographical areas. Fastly openly boasts that it can serve its customers with 70 points of presence (PoPs) worldwide. This has reduced the company's costs but the edge is now a gap in its proposition. Additionally, the two CDN players have limited their compute activities to serverless, which relies heavily on client-side (that is, device) compute. Products such as Fastly's WebAssembly service, Compute@edge, rely on the compute resources in a browser running on a device. This works well for delivering mobile apps, but it has reduced the company's interest in the edge.

Fastly and Cloudflare have centralised their infrastructure so that it is not delivered from the interconnect edge at all. This will make it difficult for them to serve the emerging edge use cases we see. At the moment, the largest single category at the industrial private edge is operational technology (OT) application modernisation, as retailers and manufacturers cloudify the software within proprietary devices but still want to run them in close proximity at the edge. These types of applications need a local, full runtime compute environment. Currently, they run on private industrial edge platforms, but we expect that they will increasingly migrate to shared, public industrial edge clouds. This is the market that Akamai is looking to target, and for the first time in 10 years it has the advantage over its competitors.

Cloudflare and other CDN providers could meet the competitive threat from Akamai's build-out in three ways

Second-generation CDN providers have several ways of countering this new threat. They can de-centralise their infrastructure and aggressively build out full runtime compute and storage edge nodes (just as Akamai is doing) and compete directly with AWS. Secondly, they could leverage their early lead and expertise in serverless, which could become a critical technology at the edge in time. This approach could be particularly attractive for Cloudflare and Fastly because they already have expertise in serverless and their platforms are growing in popularity with gaming developers. Lastly, they could look at building or buying new software-based emerging CDN platforms like Qwilt's, which would enable them to identify new markets and revenue streams. Qwilt has been gaining considerable traction with operators and content providers, however, and the time for an acquisition might have already passed. If they choose to do nothing, this may limit and possibly risk their future business.