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RESEARCH

## INSIGHT REPORT

# Hyperscale and Edge Infrastructure Update

What are the latest trends in hyperscale data centres? What are the key developments happening in edge?

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The infrastructure services market continues to grow and evolve. Hyperscale shows no signs of slowing down and is now moving into a new stage of growth. Cloud is extending into all corners of the globe and along the way, encountering new challenges and requirements. For hyperscale platforms, the build versus lease calculus is changing and new types of vendors are now part of the landscape. This has a corresponding impact on the data centre market, particularly those that are focused heavily on serving hyperscale deployments. Hyperscale is highly centralized, but the shift to a more decentralized model is underway and giving way to edge compute. It is very early days, needless to say, but tangible progress has been made on the ground in recent months. There are a number of different pieces to fit the edge puzzle together and this ensures the road ahead will be full of interesting twists and turns. But the overall progress is going to be inexorably forward.

It makes a ton of sense for hyperscale platforms to first lease infrastructure capacity when they enter a new market. But hyperscale platforms will increasingly look to build data centres as they become more familiar with procurement, operations and management in these markets they have recently entered (they will also be able to build and work with local teams). And now in some cases, we are seeing cloud providers build right out of the gate when there is a shortage of leasing options in a particular market. This willingness to build speaks to one of the main reasons why hyperscale platforms are increasingly going to build over the long-term no matter where they are in the world: it makes sense to diversify deployment models and hedge against third party operators. To be clear, this is not to say that hyperscale is going to start slanting dramatically to the build side. But it is moving in that direction more. Long-term, we should expect balanced lease versus build strategies, but leasing is still going to be a preferred and desirable deployment model. That will not change.

One of the interesting dynamics to follow is the extent to which hyperscale clouds will consolidate or diversify their third party colocation vendors. Will clouds work more closely with a trusted provider that has a global footprint and expand with them around the world as much as possible? Or will they seek to diversify and avoid putting all their eggs in one basket? The former would favour the operators with global footprints like Equinix and Digital Realty. The latter scenario would favour independent operators with unique geographic footprints, innovative technology, flexible deployment models, strategic locations and solid underlying infrastructure economics. The likely outcome is likely to fall somewhere in between. The hyperscale cloud and data centre operator are not always going to be a perfect match when it comes to requirements or even timing. They may want to enter a market the data centre operator is not in or can't enter for whatever reason. In short, diversification is a good strategy to follow and gives hyperscale platforms access to different technologies, services and geographies they can benefit and derive value from. Expect diversification to continue, though using a vendor in multiple markets will make sense (and will continue to happen) when everything matches up.

# HYPERSCALE DEMAND SHIFTING TO SECONDARY MARKETS

Hyperscale demand has centred around the familiar primary markets around the world. But second tier markets are starting to see demand and it is a matter of time before hyperscale lands and expands in places like Seoul, Jakarta, Munich, Madrid, Milan, Vancouver, Denver, Chile, Buenos Aires and many others. This is just starting to catch fire and will be a big part of the next wave of growth. From what we have seen so far, leasing is a popular deployment model, and it should be. But in some markets, a lack of local operations has pushed hyperscale to work directly with real estate firms and build.

Real estate developers are getting into the wholesale data centre game as hyperscale consumption continues to accelerate. Many of these firms are new to the data centre space and do not have sophisticated data centre construction and operations expertise. But they are able to get into the mix because they have access to desirable real estate assets. They have land parcels in strategic locations or industrial sites and buildings, with access to power, that are amenable for conversion into data centres. Some of these sites are also conveniently underutilized as the traditional brick and mortar industries that used to reside in them fade. The bottom line: real estate firms have the assets, vendors and relationships that can appeal to hyperscale tenants. They can and will move into data centre construction. The diversification of the procurement model, through partnership with real estate developers, is an additional benefit for hyperscale users.

Edge deployments have left the drawing board and are up and running. Some are in test mode and others are live. Vapor IO, EdgeMicro, Baselayer and EdgePresence are among the vendors involved in these very early stages. Their tenants are heavily represented by the service provider community, including CDNs, edge and cloud compute providers and network providers. Service providers presently active include Akamai, Packet, Flexential, StackPath, DediPath and Sprint. Service providers are going to be the engines that drive the initial wave of growth in the edge market. The modular data centre piece has been worked on for some time, but raw compute that goes inside will be needed to power the workloads and applications. Given the distributed and far-reaching nature of the model, automated provisioning and management platforms are going to be critical. And that is exactly where these service providers are focusing. In terms of the workloads these service providers hope to house: gaming, HPC and CDN are some of the first we are seeing.



Amsterdam and Singapore recently put a halt to data centre builds in the city. Governments want time to evaluate more closely the costs and benefits of data centres taking up space and power in major metros where dense populations live. In other parts of the world, like in China, major cities like Beijing have already banned data centres from being built due to the pressure it places on the power grid and the negative impact of pollution. If cities start to push hyperscale clouds, and the data centres they live in, further out from the core, applications and workloads that are latency-sensitive are not going to have the kind of infrastructure they need. Could edge compute, in smaller increments, placed strategically in a major metro, solve the problem? Could they serve this next generation of workloads and not negatively impact the local economy and society? Time will tell, but it is an interesting angle to consider.

The edge is still very much in its infancy. That much can't be denied. The biggest challenge, before this takes off, is getting the various pieces in place. There needs to be a physical data centre of course, with compute infrastructure housed in it, and this needs to be placed in a secure place. That place needs to access connectivity and this is a big challenge as edge data centres don't have peering arrangements or dense aggregations of networks. The connectivity for edge will also be multi-faceted. Fibre is important and wireless networks will be key as well. The trick to edge is bringing all this together. End users will interact with applications that live in edge data centres over wireless networks that will then travel back over 'traditional' infrastructure back to hyperscale platforms. These building blocks – hyperscale cloud, fibre, wireless and edge infrastructure – all need to work together. Is it happening? It is not out there in spades to be sure. But a recent development is very much worth noting: Vapor IO partnered up with Crown Castle (they own wireless towers and fibre networks) and AWS to build edge architectures. The idea is to connect all the way from the Vapor IO edge data centre to the AWS Direct Connect node – ultimately, getting back to the AWS cloud. Edge is very much going to be about partnership and cooperation. It will be crucial for edge to work.

The container-based data centre that has been worked on for years has seemingly found a use case in edge computing. But there are other use cases being experimented with. NextDC in Australia, for example, deployed a modular data centre built and shipped by Sweden's Flexenclosure to house a standalone telco room on its data centre campus. Other providers have toyed with the idea of using modular data centres to house riskier workloads like cryptocurrency away from core customers in somewhat more distant or remote locations. This might not be edge as we think of it now. But it is a practical application of smaller and isolated instances of data centre infrastructure.



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