Hyperscale and Microscale: Global Data Center Growth Trends
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Hyperscale cloud platforms continue relentless expansion of their physical data center footprint, now turning increasingly to emerging markets like Indonesia and South Korea. This is happening amid a massive shift of enterprise computing workloads to these platforms. Meanwhile, a lot of investment is going into deployment of edge-computing capacity at much smaller sites to support next-generation applications.

The world has seen an explosion of hyperscale data center capacity in recent years. In fact, the number of large data centers operated by hyperscale platforms has tripled since 2013, passing the 500 mark in the fall of 2019, according to the Synergy Research Group.

The US accounts for almost 40 percent of the major cloud data centers. But the fastest growth is now in EMEA and Asia Pacific regions, according to the research firm.

As platforms build more and more large-footprint computing facilities, another wave of growth is expected in the number of data centers of the smallest variety. Growth in a number of data centers and Internet of Things applications, growing demand for cloud services, and the imminent arrival of 5G wireless networks are driving demand for small sites hosting edge computing infrastructure.
Hyperscale Platforms Continue Scaling Up
A total of 59 percent of North American enterprises sourced their cloud services from hyperscalers in 2019, and that share will rise to 65 percent in 2021, results of a recent survey by Informa Tech’s Omdia research business showed.

Traditional enterprises, such as banks, insurance firms, or retailers, are moving more and more of their computing workloads out of their own data centers and into cloud facilities, both hyperscale and smaller-footprint ones.

According to Deloitte, clouds have long offered a faster, cheaper, and more flexible alternative. But more recently, clouds and SaaS services are helping banks and other organizations to break down data silos, and roll out advanced analytics in order to enter new lines of business and improve business performance.

A study of global data center energy consumption trends published in Science in February 2020, estimated that traditional enterprise data centers housed 79 percent of the world’s computing instances in 2010. In 2018, the researchers said, 89 percent of compute instances were hosted by cloud data centers.

Omdia estimated that the world’s largest cloud providers collectively grew their global data center footprint by 21 percent in 2019, compared to about 10 percent for the commercial service-provider data center market as a whole, which includes both cloud providers and colocation companies.

Amazon is the single biggest beneficiary of the cloud market growth, now accounting for 33 percent of the cloud infrastructure market, and Microsoft is in second place with 18 percent market share, according to Synergy.

But data center providers aren’t losing out. The hyperscale platforms often turn to them for data center space instead of building everything on their own.

“The hyperscale guys aren’t real estate companies,” Jabez Tan, Head of Research at Structure Research, said in an interview with Data Center Knowledge. “They don’t want to be investing a ton of bandwidth and capital and resources.”

They do have access to large amounts of capital, but it doesn’t make sense for them to invest it in buildings, he said. “They want to be investing in their cloud platform, in building more capabilities.”

But in other areas, hyperscale providers will use a build-and-lease strategy, said Macquarie Data Centres’ James Veness.
New Focus on Emerging Markets

Data center market growth continues in all the primary markets – places like Northern Virginia, London, and Singapore – but cloud platforms and specialist data center providers are now increasingly turning to emerging markets.

“Being in the region is the edge right now,” said Jacob Smith, co-founder and Chief Marketing Officer at Packet, a New York-based bare-metal cloud provider. Take, for example, Indonesia. “There’s 300 million people there, but from an internet perspective, it’s nonexistent – everything (meaning network traffic to and from users in Indonesia) backhauls to Singapore.” But now both Google Cloud and AWS are working to launch cloud availability regions in Jakarta, Indonesia’s capital.

Another example is South Korea, where Google launched an availability region in February 2020, following the same move by AWS in May 2019.

Overall, growth in data center capacity has been faster in Asia Pacific than in North America, although about on par with growth in EMEA.

Omdia estimated that total cloud provider and data center provider footprint in Asia Pacific grew 12 percent last year, compared to 9 percent in North America, and 13 percent in EMEA.

Indonesia, Japan, and Singapore saw the fastest growth among APAC markets. As elsewhere, the largest cloud providers added footprint in APAC faster than other data center operators. According to Omdia estimates, these companies’ data center footprint grew 74 percent in Japan, 30 percent in Singapore, 33 percent in China — and a whopping 720 percent in Indonesia, though from a much smaller start.

According to IDC, worldwide spending on public cloud services and infrastructure will more than double between 2019 and 2023. Public cloud spending will grow from $229 billion in 2019 to nearly $500 billion in 2023, for a five-year compound annual growth rate of 22.3 percent.

In APAC, however, IDC expects spending on these services to grow at 33.9 percent during the same time period, tripling in size to reach $76.1 billion by 2023.
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According to Cushman & Wakefield, a global real estate services firm, the top five areas of densest fiber connectivity are all in the United States: Silicon Valley, Dallas, Northern Virginia, Atlanta, and Los Angeles.

But emerging markets are catching up, with 60 new undersea cables either completed in 2019 or expected to be completed in 2020, the firm said. That’s more connectivity added than in any other two-year period in history.

According to Structure’s Tan, new data center trends and technologies typically start out in North America, then move to Europe, and finally make their way to Asia Pacific. For example, he estimates that Europe is roughly 18-24 months behind North America in terms of cloud adoption, and Asia is another 12-18 months behind Europe.

Australia, he said, is halfway between Europe and Asia in terms of cloud adoption. “Australia is both a part of Asia Pacific and a very western country at the same time. And there’s a big immigrant Asian population in Australia, so you’ll see a mix of the western way of doing business and the Asian way of doing business.”

One reason for the delay in technology adoption is fragmentation in Europe and Asia Pacific, he said. The US is a homogenous market, with a common language and set of laws. Although Europe consists of different
countries, most of them are part of the European Union. “Asia Pacific is a tough region, because it’s so fragmented, with many cultures and languages. It’s often difficult to navigate multiple jurisdictions and business environments and localize deployment to suit the local markets.”

And in Australia in particular, there are also the issues of geographic isolation and low population, said Tan.

“Australia boasts political and economic stability — it’s one of the most developed in the world in terms of the economy. If you want certainty in the workforce and in financing, then Australia is a very good place to build your data centers.” James Veness, VP Sales, Macquarie Data Centres.

Plus, Australia has the time zone advantage being one of the first countries in the world that sees the sun, making it the perfect landing spot for follow-the-sun network management.

And while in the past Australia has had limited Internet connections, new undersea cables have recently been added, with connections to Indonesia and the United States.

But there are some challenges, as well.

“Australia has such diverse weather conditions, and you have to be considerate to the risk of bush fires, floods and fluctuations in temperature. You’ve then got to consider the cost of real estate in Sydney which is comparable to the Bay Area, availability of reliable power, which is normally quite an expensive exercise, network availability, and other resources for cooling.” Veness said.

In some fast-growing areas, such as Sydney, there can be difficulties in finding and developing new data center locations, with approvals for site build taking longer than most developed countries.

Additionally, as Australia is an isolated island there can be delays in getting infrastructure to the site.

“All of these complexities make it easier for hyperscalers to rely on the track record data center providers such as Macquarie Data Centres rather than building the facilities themselves.” he said.

Worldwide, new technologies are driving hyperscale demand.

For example, over 30 percent of Australian enterprises are involved in the use of AI-based infrastructure solutions as experimental as well as production workloads, accordingly to a recent report from Research and Markets.

In addition, more than 50 percent of enterprise IT budgets are now spent on the migration to cloud-based services in Australia.
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Meanwhile, Australia’s largest city, Sydney, is one of the top five places globally in sustainability, according to Cushman & Wakefield, due to local political commitment to renewable energy. Sydney and Melbourne both place in the top six locations globally in terms of political stability.

**Growth Starting at the Edge**

Even as the largest cloud platforms are growing in both physical size and market share, there’s increasing demand for computing power ever closer to where digital services are being consumed – the so-called network edge.

One example of an edge computing use case is cloud game streaming services like Google Stadia, Microsoft xCloud, Sony PlayStation Now, and Nvidia GeForce Now. This type of workload requires fast two-way data transfer and low latency – more so than streaming video, Tan said.

But the bulk of edge computing use cases are going to be for enterprise applications.

“It’s not just driverless cars,” said Veness. “It’s the natural need to have processing done where it’s needed.”

That includes factory robots, drones, and other intelligent devices that require low network latency and lots of computing power. Putting servers closer to the endpoint devices reduces the distance and the number of network hops data has to travel.

All this will soon be powered by 5G, the next-generation wireless standard that will dramatically increase bandwidth, reduce latency, and support many more devices in the same area.

In Australia, for example, the mining industry has been a major user of edge computing.

“They’ve been doing driverless trucks and machinery for years,” said Veness. “They’re bringing all the processing right up to the mines.”

Edge data centers are evolving to meet demand with new technologies, some inspired by hyperscale providers, said Matt Trifiro, Chief Marketing Officer at Vapor IO, a Texas-based edge data center operator. That includes some of the cooling technologies.
Supporting high density is crucial at the edge, because the space constraints can be so extreme. Edge data centers are being set up on oil derricks, cruise ships, at the feet of cell towers, and in crowded city cores, where real estate is tight and expensive.

Edge data centers are also more automated than their hyperscale brethren. “If you’ve got not four locations but 4,000 locations, it’s not economic to have people there” managing the infrastructure, said Vapor IO’s Trifiro.

Finally, because there’s a need for so many different edge locations, a lot of engineering thought is going into accelerating the time it takes to deploy edge computing capacity. One big development on this front is Open19, a server and rack standard developed at LinkedIn that’s found perfect application in edge data centers.

The standard allows equipment to be mounted onto sleds that slide in and out of the rack, with all the connectors just snap into place. There’s no need for technicians to spend time plugging or unplugging cables. All the technician needs to replace equipment is a screwdriver and the ability to hand-tighten four screws.

“It has created an opportunity for a new kind of economics with remote data centers,” Trifiro said about Open19. “Now, if a piece of equipment needs to be replaced, you can put it on a truck with, say, someone who normally climbs a cell tower. You don’t need a specialist.”

Even the hyperscale cloud providers are using edge deployments, said Macquarie Data Centres’ Veness, to help with network connectivity.

“And, ironically, we are seeing some edge deployments in exactly the same data centers as core deployments,” he added. If an edge computing center is needed in a city where there are already established data centers, then it can be easier to use an existing data center.

“These sites are already established, very connected, and have all the infrastructure to run either edge or core computing,” he said.

As we look ahead, experts predict even more expansion of hyperscale cloud platforms around the world, particularly in the emerging markets, driven by use cases such as AI, 5G, consumer applications and the continued digital transformation of enterprises. Meanwhile, edge computing will continue to expand as well, putting pressure on providers to deliver infrastructure closer to where their customers products and services will be consumed.
Macquarie Data Centres delivers an unrivalled portfolio of certified colocation, connectivity, and engineering services in Australia, ranging from a single rack to multi-megawatt hyperscale requirements.

As the trusted partner of the Australian Federal Government and global Fortune 500 companies, Macquarie Data Centres is supported by over 120 NV1 trained and certified engineers and is one of the world’s most certified data center operators.

Their newest hyperscale facility IC3, located in the premium Sydney North Zone, has been designed and benchmarked to meet stringent global enterprise and government specifications.

Together with their telecommunications heritage and their leadership serving the federal government Macquarie Data Centres are uniquely positioned to deliver an orchestrated environment that is better connected and highly secure, with enterprise-scale efficiencies.

If you’re considering site-selection or cloud expansion into Australia, Macquarie Data Centres have tailored solutions for all your global infrastructure management requirements. Because they operate their own sovereign Australian data centres, they can customise any design for your needs today and accommodate your growth for tomorrow.

Macquarie Data Centres have a team of engineers that you can use for technical work in any environment, 24 hours a day, 7 days a week, 365 days a year. Their remote hands and feet support team can easily deploy your projects, without you having to be physically in country. They love a challenge – if you can think it, they can build it.

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