FIBER INFRASTRUCTURE & THE HYPERSCALER SHIFT: CHALLENGES & OPPORTUNITIES FOR THE ASIA-PACIFIC

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Executive Summary

The rise of hyperscalers—led by Amazon Web Services (AWS), Microsoft Azure, Google Cloud, and Alibaba Cloud—is redefining the global digital infrastructure landscape. These entities, once narrowly focused on cloud services, have evolved into vertically integrated operators with substantial ownership of international and regional data infrastructure. Their growing control over submarine cable systems, long-haul terrestrial fiber, edge data centers, and AI infrastructure is beginning to bypass traditional telecom providers and challenge existing value chains.

This white paper provides a strategic analysis of how hyperscaler expansion is impacting telecom operators and fiber infrastructure stakeholders in the Asia Pacific. It draws attention to the increasingly blurred boundaries between hyperscalers and telcos, as both groups pursue overlapping ambitions in cloud computing, edge services, and vertical industry solutions.

While hyperscalers were once considered large-scale customers of telcos, they are now both competitors and partners. By deploying proprietary networks and leveraging their financial strength, hyperscalers are reshaping international and domestic bandwidth markets. At the same time, they remain dependent on national and metro fiber assets—especially in last-mile access and localized interconnection—creating new co-investment and service integration opportunities for regional fiber providers.

The paper identifies five key structural trends shaping this shift:

- **Infrastructure Sovereignty:** Hyperscalers are pursuing partial or full ownership of transmission assets, from subsea cables to dark fiber routes, to improve network control, performance, and regulatory compliance.

- **Edge Expansion:** Driven by AI and latency-sensitive applications, hyperscalers are moving computing resources closer to end-users, intensifying demand for regional fiber backhaul and metro connectivity.

- **Telco Transformation:** Incumbent operators are repositioning as “techcos,” investing in digital platforms, cloud partnerships, and vertical solutions. However, legacy constraints and cultural inertia often slow this transition.

- **Regulatory Complexity:** Data localization laws and energy sustainability requirements—particularly acute in the Asia Pacific—are influencing infrastructure siting decisions and opening the door to public-private cooperation.

- **Co-opetition Models:** Strategic partnerships between telcos and hyperscalers are proliferating, often involving shared infrastructure, cloud integration, AI collaboration, and skills development.

The report further explores the business model implications for fiber network operators, noting that hyperscaler-driven demand is creating new monetization avenues but also intensifying pressure on traditional wholesale pricing and control over key customer relationships.

To remain relevant, fiber infrastructure players must strategically reposition as enablers of hyperscaler growth. This means investing in resilient and scalable metro networks, developing neutral-host interconnection models, forming multi-party alliances, and actively participating in regulatory and policy dialogues that balance foreign investment with national digital sovereignty.

The paper concludes that the Asia Pacific region is at a pivotal moment. Hyperscaler expansion is accelerating, but the success of that growth—particularly for AI workloads—will hinge on the availability, quality, and proximity of terrestrial fiber infrastructure. For FNCAP and its members, the next wave of value creation will not be driven by bandwidth alone, but by the ability to architect and operate integrated, future-proof infrastructure ecosystems.

1- Hyperscalers - a brief introduction and definition

Although hyperscalers dominate the digital lives of internet users—both consumers and businesses—there is no universally standardized definition of the term hyperscaler. The term is commonly believed to originate from hyperscale computing, a methodology that enables software architectures to expand and scale dynamically in response to increasing demand.

Nevertheless, a broadly accepted understanding has emerged based on a consistent set of defining characteristics. Hyperscalers are typically large-scale data center operators or global cloud service providers distinguished by the following attributes:

- **Scalability and computing power:** The ability to deliver vast amounts of compute, storage, and network capacity. Hyperscalers can dynamically scale their IT infrastructure to support millions of users simultaneously, without compromising performance or efficiency.

- **Own infrastructure:** Direct ownership and operation of substantial portions of their data center, IT, and telecommunications infrastructure.

- **Global presence:** Hyperscalers maintain data centers across multiple countries to ensure service reliability and regulatory compliance. Data center locations and offerings are tailored to align with local legal and operational requirements.

- **Extensive service portfolio:** Offerings range from Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) to Software as a Service (SaaS), as well as value-added services in areas such as artificial intelligence (AI), cybersecurity, and advanced analytics.

- **Significant capital:** Hyperscalers invest heavily in hardware, software, and the construction of new data centers (including edge sites), along with substantial research and development (R&D) expenditures in fields such as AI and quantum computing.

In the everyday life of most people, hyperscalers play an enormous but unknown role, in enabling modern digital services. Streaming platforms, social media, e-commerce sites, multiplayer gaming, and cloud-based productivity tools all depend on the scale, reliability, and performance provided by hyperscaler infrastructure.

For business and company customers, hyperscalers support a wide array of critical services, including cloud computing, real-time data processing, AI and machine learning applications. Their infrastructure has become foundational to digital transformation across virtually all industries.

It is not astonishing that the leading hyperscalers evolved from companies with their own need for globally distributed, high-performance computing resources and robust inter-data center connectivity. In terms of market shares, revenues, investment levels, and global footprint, **Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP, a subsidiary of Alphabet Inc.)** are widely recognized as the leading players in the global market. Depending on the definition and market scope used, these three are estimated to collectively account for approximately two-thirds of the hyperscaler market.

The remaining third of the market is composed of a broad mix of major players and specialized providers. **Alibaba Cloud,** based in China, is frequently cited as the fourth-largest hyperscaler globally. Other significant actors include **IBM Cloud, Oracle Cloud Infrastructure (OCI), and SAP Cloud,** all of which hold strong positions among enterprise customers. Additional companies commonly ranked among the top 10 to top 20 hyperscalers include China-based **Tencent Cloud, Huawei Cloud, and Baidu Cloud.** There are also major hyperscale platforms and tenants—such as Salesforce, which specializes in enterprise SaaS, and Meta Platforms (Facebook, WhatsApp) and Apple iCloud—who, as large-scale consumers of cloud infrastructure, continue to drive demand for hyperscale data centers. However, these companies are **not themselves hyperscalers**, as they do not offer their infrastructure or cloud capacity to external customers.

This white paper will primarily focus on the top four hyperscalers—**AWS, Azure, Google Cloud, and Alibaba Cloud**—as well as the leading niche providers **IBM Cloud and Oracle Cloud,** given their strategic relevance to the fiber and telecom ecosystem.

2- Drivers of the hyperscale business/growth

Several key factors are propelling the growth of hyperscalers. Indeed, most of them are mutually dependent or are influencing one another. Prominent demand drivers are e.g.:

Cloud services: The global cloud services market—spanning both residential and enterprise segments—continues to exhibit robust and sustained growth. Hyperscalers remain central to this trend as the primary enablers of on-demand compute and storage capacity.

AI, machine learning (ML) and generative AI (GenAI) applications: The proliferation of AI-driven applications has significantly increased demand for hyperscaler infrastructure. These actors benefit in two ways: by providing compute capacity for third-party AI/ML providers, and by investing directly in their own AI capabilities, platforms, and services.

Edge computing: The deployment of edge computing infrastructures is accelerating to process data closer to the source. This is required and fuelled by applications requiring real-time analytics or very low latency, e.g. AI based applications, autonomous vehicles, 5G applications, IoT or IIoT (Industrial Internet of Things) applications within 5G campus networks etc.

Mobile broadband services and applications: In regions where FTTH/B or other fixed high-speed access technologies are either impractical or prohibitively expensive, mobile broadband—particularly 5G—serves as a viable alternative. Hyperscalers are increasingly partnering with mobile operators to colocate edge computing capabilities near cellular base stations, supporting both ultra-low latency and high-throughput applications.

Regional regulatory compliances: The global regulatory environment is becoming increasingly complex and fragmented. Hyperscalers must navigate national data sovereignty laws, cybersecurity frameworks, and sustainability requirements. For example, Thailand is set to implement new cloud cybersecurity standards by 2026, while countries like Singapore and the Netherlands are placing restrictions on new data center deployments due to energy consumption and land use. Data localization mandates are also intensifying, requiring sensitive or classified data to remain within national borders, as seen in markets such as Indonesia, Japan, and Singapore. Global hyperscalers operating in Europe must comply with the General Data Protection Regulation (GDPR) as well as additional national laws in markets such as Germany and France. This regulatory environment is prompting further investment in country-specific data centers—often in partnership with local telecom operators. Note: in Europe, some non-EU countries like Switzerland or Norway have adjusted their data protection laws to the current EU laws, therefore data protection laws are quite similar all over Europe.

Hybrid and multi-cloud strategies: An increasing number of enterprises are adopting hybrid and multi-cloud architectures. These approaches leverage multiple hyperscaler platforms alongside on-premise infrastructure to avoid vendor lock-in, enhance resilience and scalability, and meet varying compliance needs across jurisdictions. Mergers and acquisitions further drive the need to integrate heterogeneous IT environments.

Expanding the global footprint: Hyperscalers are actively entering underserved markets to broaden their global reach. This includes both physical infrastructure deployment in new geographies and service expansion in regions with rising digital demand. Chinese cloud providers are making strategic moves into European markets.

Entering new markets: Hyperscalers—both dominant players and niche providers—are continuously expanding their service portfolios in response to evolving enterprise needs. This includes moving beyond core IaaS and PaaS offerings to provide industry-specific solutions and integrated digital platforms.

Public market research reports offer a wide range of estimates regarding the value and trajectory of hyperscaler-related segments. As every study is applying definitions of its own, focusing on specific market actors (e.g. looking only at hyperscalers, including telcos/service providers or else hardware/software manufacturers) etc., the estimated current and future market values can vary importantly. Nonetheless, the overall growth trajectory remains strongly positive:

- Revenues generated globally by **public cloud services** are estimated at around US$ 500 billion and US$ 800 billion for 2024 with annual growth rates around 20%. This suggests that the market could reach between US$ 1 trillion and US$ 2 trillion within five years. [1]

- Estimates of the global **hybrid cloud market** place market size broadly around US$ 150 billion revenues at present with growth projections between 15% and 20% annually. [1]

- Regarding the **global hyperscale cloud and data center market,** estimates are between US$ 150 billion to over US$ 300 billion for 2024 with expected growth rates between 25% and 40% over the coming years. [1]

- Forecasts for the **AI sector** vary even more widely, as estimates depend heavily on scope—whether focused on specific applications, sectors, or technology types such as GenAI and machine learning. [1]

[1] Market size and growth estimations are based on a synthesis of multiple third-party sources and proprietary analysis of InfoCom. Due to the wide range of figure references and methodologies, individual sources are not cited. These figures also reflect our own market experience and internal benchmarks.

3 - Infrastructure deployment trends

Hyperscalers require scalable, secure, and high-performance network infrastructures to meet the escalating global data demands driven by the growth of cloud services, AI applications and other services or factors described in the preceding section. Ensuring greater control over data transmission, reducing reliance on traditional telecom operators, and achieving long-term cost efficiency have led some of the leading hyperscalers to invest significantly in building their own telecom and interconnection infrastructure.

The strategies employed by hyperscalers to interconnect their globally distributed data centers vary significantly based on geographic, regulatory, and cost considerations. The following approaches are commonly used—individually or in combination—depending on market conditions and local constraints:

- **Proprietary infrastructure:** Hyperscalers deploy their own fiber infrastructure, which may include direct construction, use of leased empty ducts, or investment in alternative proprietary technologies such as satellite constellations. This approach maximizes autonomy, especially in high-traffic routes or strategic corridors.

- **Semi-proprietary infrastructure:** This strategy involves leasing dark fiber, acquiring capacity rights (Indefeasible Rights of Use or IRUs), or taking equity stakes in infrastructure consortia—particularly in submarine cable systems. In such cases, the hyperscaler remains responsible for deploying and managing the transmission layer, including technologies such as Dense Wavelength Division Multiplexing (DWDM) and software-defined networking (SDN).

- **Partnerships with telcos or specialized infrastructure providers:** Where full ownership is impractical or suboptimal, hyperscalers lease infrastructure capacity or purchase interconnection services (e.g., wavelength services, DWDM links) from established carriers or neutral network operators.

On top of their physical national and global infrastructure (i.e. notably optical cables), hyperscalers prioritize the deployment of technologies that enable ultra-high-speed, low-latency, and easily scalable networks. They primarily focus on software-based virtualized, and programmable network architectures that allow for rapid adaptation to new technologies and service models.

This forward-looking infrastructure philosophy ensures that hyperscalers are not locked into legacy systems and can respond flexibly to both technological evolution and fluctuating customer demands across diverse global markets.

Global infrastructure

Historically, voice and data communication around the globe has been realized thanks to the networks of telecom companies. Therefore, it might be astonishing to the larger public that hyperscalers now own and operate the largest global networks. Indeed, most of the the global Internet traffic travels over hyperscalers' own backbone networks.

The three leading actors (and/or their mother companies)—AWS (Amazon), Google (Alphabet) and Azure (Microsoft)—have discreetly built and extended their global infrastructure. Their investments include extensive deployments of submarine cable systems and long-haul terrestrial backbones, giving them direct control over the capacity, performance, and routing of their global data flows.

Others like Alibaba, Meta, and Apple are also investing in global infrastructures but are still far behind the extension of the three leading hyperscalers. Alternatively, some leading hyperscalers—notably IBM and Oracle—have opted for a partnership-based approach. Rather than deploying their own global physical networks, these providers primarily rely on partnerships with telecommunications operators to interconnect their regional and international data centers. This approach allows them to focus investment on platform development and enterprise services, while leveraging existing carrier infrastructure for global connectivity.

Submarine cables

Historically, telecom carriers or infrastructure specialists invested in and operated submarine cable systems. For the last 15 years, hyperscalers like **AWS/Amazon, Google/Alphabet,** and **Azure/Microsoft** have taken a leading role in this domain—some even acquiring **exclusive ownership of transoceanic routes.**

Today, hyperscalers participate in a range of submarine cable investment models: they **fully own, co-own via consortia,** or **secure long-term capacity rights (IRUs).** These approaches provide both cost-sharing benefits and strategic control over global data flows. Between 2019 and 2024, it is estimated that hyperscalers were responsible for approximately **20% to 25% of all newly deployed submarine cable systems.** By early 2025, they were believed to have **funded or co-funded close to 10% of the roughly 570 submarine cables currently in service**—a figure made more striking by the fact that the total number of cable systems has **doubled over the last decade.**

While telecom operators continue to play a central role in many global and regional cable systems, particularly through large consortia, the growing number of hyperscaler-owned or hyperscaler-controlled routes reflects a **structural shift in the control of international data flows.**

While the total capital invested by hyperscalers in submarine systems is difficult to quantify—often being bundled with broader data center operators network infrastructure capex—several public announcements illustrate the scale of commitment:

- In spring 2024, Google announced two subsea cables between the USA and Japan, investing around US$ 1 billion. From 2016 to 2018, Google's capital expenditure on more than 130 points of presence and 14 submarine cable systems was estimated at **US$ 47 billion.** [2]

- In **early 2025, Meta** unveiled its **"Waterworth"** project, an ambitious plan to **interconnect five continents via a 50,000-kilometer** submarine cable network, with estimated investment exceeding **US$ 10 billion.** [2]

[2] *Market size and growth estimations are based on a synthesis of multiple third-party sources and proprietary analysis of InfoCom. Due to the wide range of figure references and methodologies, individual sources are not cited. These figures also reflect our own market experience and internal benchmarks.*

As summarized in Table 1, the investment strategies of the three leading hyperscalers—AWS, Azure, and Google—are largely aligned, with all actively acquiring infrastructure and capacity in global subsea systems. **Meta** stands out as an additional major investor.

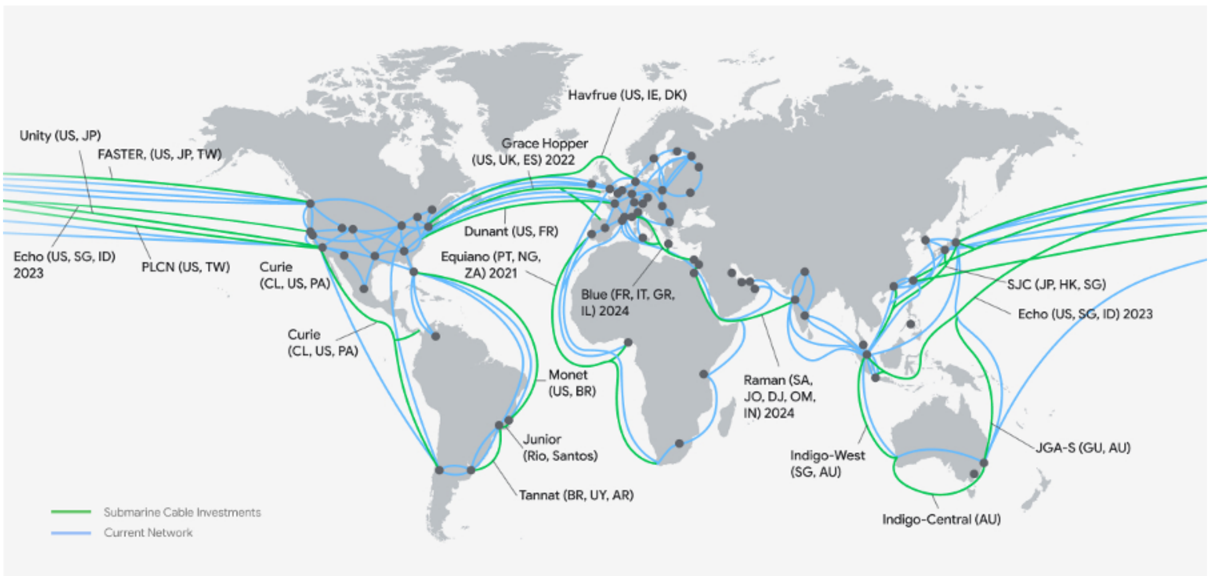
By contrast, **smaller hyperscalers,** including **IBM Cloud** and **Oracle Cloud,** have not pursued direct infrastructure ownership in this domain. Instead, they continue to rely on **partnerships with telecom operators** to access international capacity and interconnect their global data center footprints.

Table 1 - Submarine cable commitment

Actors	Own/private cables	Consortium participation or partnerships with investors (shared investment costs, diversified infrastructure)	Ownership stakes, capacity rights (IRUs) in submarine cables
aws	✓ e.g. 1 fiber in Cap-1 (trans-Pacific)	✓ e.g. Jupiter (USA-APAC)	✓ e.g. Marea Cable (USA-Spain)
	✕ *(Note: Microsoft is sometimes a co-investor, but does not maintain the cable system)*	✓ e.g. - New Cross Pacific (NCP, trans-Pacific)	✓ e.g. Marea Cable (USA-Spain)
	✓ e.g. Equiano, Dunant	✓ e.g. Unity (trans-Pacific) and planned Humboldt (Chile-Australia)	Not disclosed
Alibaba Cloud	✕	✓ e.g. APG (China, South-East Asia - Japan)	Not disclosed
ORACLE	✕	✕	✕
IBM	✕	✕	✕

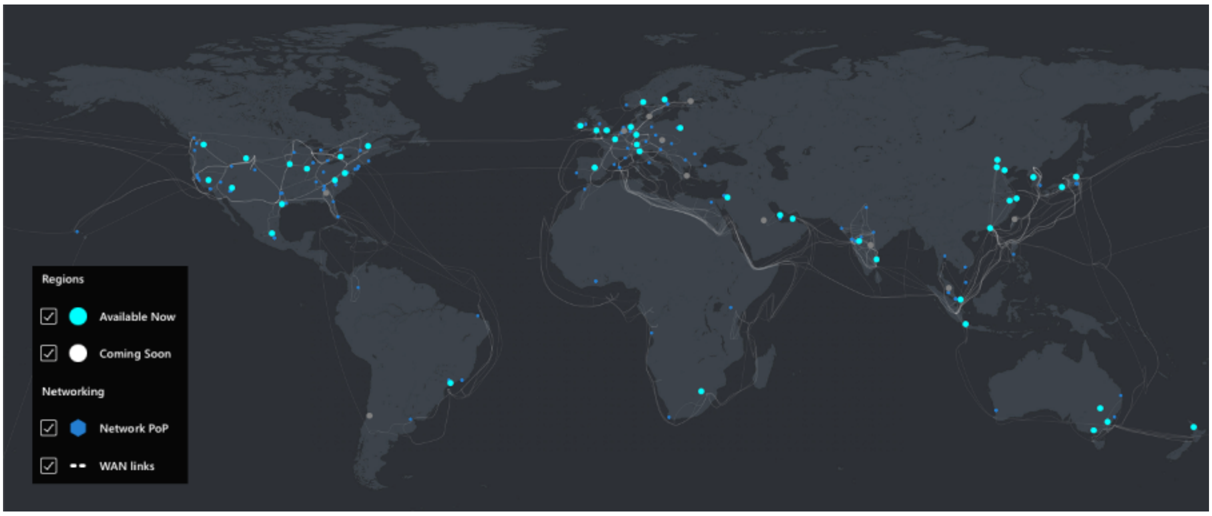
Figures 2, 3, and 4 *provide an overview of the global network footprints of the three leading hyperscalers—AWS, Microsoft, and Google—who are also the most active investors in proprietary worldwide infrastructure.*

Figure 2*- Google Cloud Network (Source: Google, Spring 2025)* [3]



[3] *Google Cloud Network. Spring 2025. https://cloud.google.com/about/locations?hl=de#network*

Figure 3- *Microsoft Datacenters (Source: Microsoft, Spring 2025)* [4]



[4]*Microsoft. Spring 2025. https://datacenters.microsoft.com/globe/explore/?view=map*

Figure 4- *AWS Infrastructure (Source: AWS, End 2024)* [5]

[5]*AWS. End 2024. https://aws.amazon.com/de/blogs/networking-and-content-delivery/demystifying-aws-data-transfer-services-to-build-secure-and-reliableapplications*

Dark fiber and empty ducts

Hyperscalers are playing a pivotal role in reshaping the dark fiber market. Their escalating infrastructure needs are accelerating the expansion of dark fiber capacity—particularly in cities with dense clusters of data centers. To meet this demand, infrastructure providers are scaling up their metro networks and constructing new long-haul routes at national and international levels, often in response to hyperscaler-specific requirements.

The current market size of the global dark fiber market is estimated at around **US$ 6 billion in 2023/24** with an estimated **compounded annual growth rate (CAGR) of around 10%** during the preceding 5 years. This significant growth is expected to continue as various forecasts predict a CAGR of between **10 to 15%** for the next 5 to 10 years, mainly fuelled by data-intensive applications and extension of data centers. North America, Europe and Asia-Pacific account for a market share between 25% to 30% respectively, with the APAC region showing currently the highest growth rates.

Regionally, **North America, Europe, and Asia-Pacific each** account for **25% to 30%** of global market share, with **Asia-Pacific currently experiencing the fastest growth.**

Although many hyperscaler infrastructure agreements remain confidential, several categories of providers are known to be frequently engaged. These include:

- **National telecom carriers** with extensive terrestrial networks (e.g., Interlink Telecom in Thailand, PLDT or Converge ICT in the Philippines, Crown Castle in the USA)

- **International and regional operators** with both long-haul and metro infrastructure (e.g., Arelion, Colt Technologies, Lumen Technologies, NTT Communications, Telin Indonesia/Singapore, Time dotCom in Malaysia, and Zayo)

- **Specialized infrastructure providers** outside the traditional telco space, offering dark fiber and empty ducts laid along railway lines, power grids, or utility corridors (e.g., RailTel in India, SPTel in Singapore)

Thanks to their **significant market power and investment capacity,** hyperscalers can negotiate favorable terms, service level agreements, and new pricing models with higher flexibility and scalability. This leads to more competitive pricing and a route diversity of which other dark fiber customers are also benefiting. However, these dynamics also impose **downward pressure on margins and intensify commercial pressure on dark fiber providers**—particularly metropolitan or national telcos—who must now adapt to hyperscalers' evolving demands and conditions.

Adding further complexity, hyperscalers are **simultaneously deploying their own terrestrial and subsea infrastructure.** As a result, investments in new dark fiber routes do not always translate into stable, long-term revenue streams for traditional providers.

As seen in the submarine cable segment, the strongest demand and most disruptive impact in dark fiber markets—both nationally and internationally—originate from **Google, AWS, and Microsoft Azure,** followed by **Meta and Alibaba.**

Access layer infrastructure

Most infrastructure commitments of hyperscalers concern the terrestrial interconnection of data centers (from the metro level to long-haul connections) or submarine cables interconnecting continents. Nevertheless, **end-users also require a reliable and secure access to data centers and services/applications.** Especially if SMEs or large companies are concerned, the demand in capacity, latency, reliability and security certainly cannot be realized by a simple xDSL connection via the public Internet.

Deploying a seamless, global last-mile network—whether wired or wireless—remains **commercially and logistically unfeasible** for hyperscalers, due to the high cost of infrastructure buildouts and regulatory or licensing constraints at the national level. As a result, **traditional and local telecom operators remain indispensable partners** for enabling customer connectivity, particularly in the access layer.

That said, select hyperscaler-led initiatives in last-mile infrastructure do exist, albeit on a limited scale:

- **FTTH/B investment by Alphabet Inc.:** With Google Fiber (GFiber), Alphabet Inc. announced a FTTH deployment initiative in 2010. So far, FTTH accesses have been built (or even bought) in over 200 US cities in 19 US states. According to recent announcements (after a slowed-down commitment in preceding years), the coverage of 10 million US households and business locations is planned until 2026 (i.e. nearly 10% of US households). However, this commitment remains so far restricted to the US market.

- **Satellite connections via the Kuiper project by Amazon:** In early 2025, Amazon launched the first 27 satellites of its planned **3,200-satellite constellation** under Project Kuiper. The aim is to provide broadband internet to underserved areas globally. While satellite technology offers an attractive solution for hard-to-reach locations where fiber deployment is prohibitively expensive or slow, it still **cannot match fiber's ultra-low latency** performance.

Beyond these isolated examples, **hyperscaler-owned last-mile connectivity remains largely limited to specific, high-value enterprise use cases**—such as direct fiber links for large corporations. To date, there are no significant or recurring cases of hyperscalers acquiring local telecom carriers to secure access infrastructure.

Nonetheless, leading hyperscalers are pursuing **multiple strategies to move closer to the customer,** thereby reducing reliance on non-proprietary networks:

- **Bringing data centers, technology/platforms and services closer to the end-user:**

    - **Deploying additional own (edge computing) data centers,** e.g.: In early 2025, Alibaba announced investments of US$ 53 bn within the next 3 years in cloud computing and AI infrastructure and Microsoft announced investments of US$ 80 bn within 1st HY 2025 to expand its global network of AI-enabled data centers.

    - **Co-operating with other data center providers or telcos to host and embed platforms and services,** e.g.: AWS is deploying AWS Wavelength in the networks of Orange (e.g. in Morocco and Senegal), SK Telecom and Verizon. In Italy, Oracle is using both data centers and fiber backbone of Rai Way for its AI applications and cloud services.

- **Building metro fiber rings** interconnecting data centers, network nodes and customers is also often cited as applied strategy. However, the leading hyperscalers either do not disclose specific, local commitments (e.g. leasing dark fiber to interconnect data centers) or they rely on local telco partners to realize the metro connectivity of customers (e.g. Microsoft's ExpressRoute Metro).

- **Satellite links:** Azure, Google, Oracle and IBM co-operate with satellite operators like SES or Starlink to realize customer site connections. Alibaba Cloud is so far not officially linked to Chinese satellite projects, but it shows a strategic interest in integrating satellite technology with cloud computing services.

- **Wireless connections:** 4G or 5G connections are realized in cooperating with on-site available mobile telcos or license holders (e.g. the Alibaba Smart Access Gateway/SmartAG service). So far, hyperscalers do not own mobile spectrum licenses for public services (however, commitments in unlicensed spectrum bands or private 5G networks can partially exist).

4- Disruption of traditional telco models & business implications

Market and investment power

The six leading telecommunications operators (by revenue) collectively generate **more than twice the revenue** of the six dominant hyperscaler business units. However, when comparing at the **group or parent company level,** the situation is reversed: the combined revenue of the leading telcos amounts to **only half** of that of the hyperscalers' parent companies.

The market and investment power of the companies behind the leading hyperscalers becomes even more striking when looking at the market capitalization. Alphabet Inc., Amazon and Microsoft each have market capitalizations that are double—or even more than triple—the combined value of the six leading global telcos. Even the three smaller actors (Alibaba, IBM, Oracle) together account for roughly the same market capitalization as the combined value of the six leading telcos.

Table 5- Leading hyperscalers: revenues and market capitalization

Actors	Revenues 2024 (fiscal year December if not cited otherwise) in US $ bn	Market Capitalization (May '25) in US $
amazon	**638**	**2.13 trillion**
Of which: AWS	**107.556**	
Microsoft	**245.122 (*June*)**	**3.338 trillion**
Of which: Microsoft Intelligent Cloud	**105.362 (*June*)**	
Of which: Microsoft Azure (part of "Intelligent Cloud")	**62-70 (*estimated*)**	
Alphabet	**350.018**	**2.05 trillion**
Of which: Google Cloud	**43.229**	
Alibaba Cloud	**137.3 (*March '25*)**	**274 - 296 bn**
Of which: Alibaba Cloud	**16,26 (*March '25*)**	
ORACLE	**52.961 (*May '24*)**	**437.4 bn**
Of which: Cloud services & license support	**39.383**	
Of which: Cloud license & on-premise-license	**5.081**	
IBM	**62.8**	**240,37 bn**
Of which: Software segment (incl. hybrid platforms)	**27.1**	
Infrastructure segment (incl. hybrid infrastructure)	**14.0**	

Note: *Market capitalization is only available for the groups or mother companies of the hyperscalers. Also, not every hyperscaler is publishing revenues. Therefore, the revenues of the sectors being relevant for the hyperscaler business (e.g. at Microsoft, Oracle, IBM) are indicated.*

Table 6- Leading telcos: revenues and market capitalization

Actors	Revenues in US $ bn (end December 2024)	Market Capitalization in US $ bn (May 2025)
中国移动 China Mobile	142.7	246.5 bn
verizon	134.8	180 - 185 bn
T	130.27	155 - 167 bn
COMCAST	123.73	128 -132 bn
AT&T	122.3	197.3 bn
NTT	92.8 (March 25)	87.9 bn

Business transformations and co-opetition

To unlock new revenue streams and reduce operating costs, both hyperscalers and telecom operators are increasingly offering services that **encroach upon each other's traditional domains.**

As shown in the preceding section, hyperscalers are investing heavily in own infrastructure and are getting more and more control over international data traffic.

Furthermore, they are increasingly offering industry-specific, i.e. vertical, solutions, e.g. for healthcare or manufacturing sectors. These are indeed domains and commitments, telcos also hope to monetize.

To address the challenges posed by hyperscalers and to open new revenue streams, some telcos are leaving the path of pure connectivity and telecommunication services providers. These firms are initiating a broader transformation into so-called **"techcos"**—technology-driven companies that go beyond traditional telecom services to offer digital platforms, cloud solutions, analytics, and vertical market applications.

The following Table 7 summarizes major key tasks and strategies that are integral to this transformation.

Table 7 - Transformation aspects: from telco to techco

Key components/tasks	Example/realization	Problems and challenges
Digital infrastructure & platforms	**Investing and developing digital platforms and network virtualization**	**Legacy infrastructure can hinder or slow down the switch to new technologies. Regulatory compliances may bind investments in outdated services.**
Product and solution innovation	**Launching and expanding products/services that go beyond traditional telco offerings (e.g. cloud computing, IoT, AI, cybersecurity services etc.)**	**Required investments, innovative spirit**
Organizational changes	**Promoting an internal culture of innovation and agility, enabling new ways of working, internal restructuring/realigning to foster digital innovation and customer-centric solutions**	**Cultural hurdles, ingrained structures and habits, internal inertia**
Workforce upskilling	**Fostering skills (e.g. in software development, data analytics, digital marketing) combined with skilled staff retaining programs**	**Problems of acquiring new, skilled staff (general lack of experts), significant investments to train staff**
Leveraging data analytics	**For internal usage (for decision-makers) and to create value-added services for customers**	**National regulatory compliances may block or limit commitments**
Strategic partnerships	**Creating an ecosystem of partnerships with technology innovators to accelerate the digital transformation/ innovation and to enter new markets**	**Providing APIs to developers**
Increase expenditures in R&D	**Developing (proprietary) services and technologies to distinguish from hyperscalers**	**Finding funds**
Increasing the customer experience	**Creating new, digital interaction channels with customers; personalization of services (e.g. via data analytics, AI)**	**Regulatory compliances (data protection laws), limited amount of data to analyze, required investments (e.g. in AI)**

Dominant or global telcos that are pursuing their transformation into techcos, e.g. in investing in digital platforms, cloud solutions, analytics platforms or AI are e.g. AT&T, BT group, Deutsche Telekom, Singtel, SK Telecom, Telefónica, Orange, Verizon and Vodafone.

However, this transformation from telco into techco is not the sole strategy adopted. In fact, telcos are pursuing multifaceted strategies that sometimes appear contradictory. While each company aims to leverage its core strengths, it is also seeking entry into domains traditionally dominated by the other side—creating a dynamic landscape where **hyperscalers and telcos simultaneously compete and cooperate.**

This evolving environment is best described as co-opetition—a complex interplay of strategic alignment and rivalry. With every telco and hyperscaler adopting an individual strategy, it is quite impossible to present a simplified graph of the current situation of co-opetition, showing objectives, implications, threats, fears and chosen solutions.

Examples of Telco Strategies within a Co-opetition Framework:

- **Investing in edge and cloud computing platforms:** These efforts are typically viable at a national scale but are often financially unfeasible at a global level.
- **Forming partnerships and joint ventures with hyperscalers:** Telcos are increasingly shifting network functions and compute workloads onto hyperscaler platforms, particularly where speed and scale are mission-critical.
- **Co-developing services with hyperscalers:** Collaborations in domains such as AI, 5G, and enterprise platforms are becoming more common.

- **Building hyperscaler-agnostic platforms:** To mitigate dependency, telcos are developing solutions that allow flexibility across cloud providers.

- **Establishing global and industry alliances:** Telcos are participating in joint initiatives—such as for AI, Open RAN, and shared standards—to retain influence over the future direction of technology.

- **Reselling and bundling hyperscaler SaaS offerings:** Telcos package these services with their own to target SMEs, offering integrated and standardized solutions.

- **Leveraging local market presence:** Telcos benefit from their deep-rooted relationships and trust with domestic industries and regulators.

- **Concerns over loss of control and increased security risks:** When outsourcing or sharing infrastructure with hyperscalers, telcos cite potential vulnerabilities. In response, many are increasing investments in cybersecurity and infrastructure hardening.

- **Avoiding vendor lock-in:** Both telcos and enterprise customers are wary of relying on a single cloud provider. As a result, telcos are adopting hybrid and multi-cloud strategies—many supported by hyperscalers like Oracle and IBM that position themselves as enablers of such flexibility.

- **Managing legacy infrastructure:** Outdated systems and slow innovation cycles continue to be barriers to rapid transformation.

- **Navigating regulatory compliance:** Telcos often hold a strategic advantage at the national level due to their local licensing and compliance history. However, regulatory complexities intensify when engaging with global hyperscaler platforms or launching cross-border initiatives.

- **Advocating for national sovereignty in cloud and data:** Many telcos actively engage regulators to support domestic cloud infrastructure, sovereign cloud frameworks, and localized data protection laws.

- **Expanding and localizing service portfolios:** Telcos are increasingly developing vertical-specific solutions and focusing on country-specific requirements or niche market opportunities.

Examples of Hyperscaler Strategies and Considerations in a Co-opetition Context:

- **Lack of access infrastructure:** Hyperscalers do not operate their own last-mile networks and must rely on national or local telcos for access infrastructure and spectrum licenses.

- **Pushing toward the network edge:** To reduce latency and enable edge computing use cases, hyperscalers increasingly form partnerships with telcos for edge node deployment and localized processing.

- **Expanding into industry-specific verticals:** Hyperscalers are moving into sectors such as healthcare, manufacturing, and automotive—often by developing tailored solutions or acquiring specialized companies.

- **Collecting global usage data and customer insights:** Their platforms enable the aggregation of massive datasets across geographies, providing critical inputs for product development, analytics, and advertising strategies.

- **Structural advantages:** Hyperscalers benefit from large-scale R&D budgets, global infrastructure reach, rapid innovation cycles, a “software-first” development philosophy, and strong ecosystems of developers and partners.

- **Limited local presence:** Despite global reach, hyperscalers often lack deep in-country operational presence, making them dependent on local partners for compliance, relationships, and deployment.

5- Trends & market outlook

The current momentum surrounding AI applications—driven by both hyperscalers and telcos—is giving rise to a dual reality in the market. On one hand, smaller telecom operators face significant challenges in their transition to becoming techcos. Many fear being relegated to the role of mere connectivity providers for hyperscalers, with limited avenues for value creation. This concern has led to increased advocacy for national legislation aimed at limiting the market power of hyperscalers.

At the same time, broader political and strategic considerations are influencing how countries and industry players approach digital infrastructure development. In several regions, there is a growing interest in strengthening domestic capabilities and reducing overreliance on foreign technology platforms. As a result, telcos and equipment vendors are forming consortia to build AI infrastructure—often with the support of public institutions or national policy frameworks.

On the other hand, most telcos do not have the investment scale required to compete with hyperscalers, even at a national level. In particular, AI applications that demand high-speed connectivity and ultra-low latency require a dense network of data centers located close to end-users. These infrastructure demands have prompted some governments and telcos to **proactively engage with hyperscalers**—either by offering opportunities to co-develop new data centers or by leasing existing domestic infrastructure that is ready to support AI workloads.

However, the rapid increase in AI-related processing also translates into **significantly higher energy consumption,** particularly for data center cooling systems. The associated rise in electricity and water use can strain local resources, potentially limiting the expansion of necessary infrastructure in some areas. As a result, growing concerns over **energy efficiency, water usage, and long-term environmental sustainability** are becoming increasingly central to infrastructure planning. Hyperscalers, independent data center providers (including telcos), and public sector stakeholders are all seeking for innovative solutions or strategies.

Example- Green energy and sustainability efforts in APAC region

To meet the growing demand of AI workloads while facing environmental and natural resource challenges, a range of initiatives is underway across the Asia-Pacific region. These efforts reflect growing alignment between industry innovation and sustainability goals. Notable examples include:

- With its **"Green DC Roadmap",** Singapore has established green technology criteria for new data centers, being regularly updated and jointly developed with industry input. Only highly energy-efficient projects receive regulatory approval.

- In Malaysia, the hyperscale data center specialist AirTrunk is about to develop a rooftop solar system for one of its data centers, providing renewable energy. It follows similar strategies to those of PT DCI Indonesia TbK, having built its first **solar-powered data center** in 2023.

- In Singapore, Keppel Data Centers plans to develop a **floating data center,** being cooled with seawater—an innovative response to both cooling efficiency challenges and the country's scarcity of suitable land for new facilities.

These are of course only a very limited number of examples of the various efforts taken e.g. to reduce the carbon footprint, to save potable water, or to enhance energy supply security on a domestic level and across borders.

Example- Technological advancements

To enhance the performance of AI workloads and to ensure sustainable, cost-efficient data operations and transmissions, hyperscalers and data center operators also invest in innovations or improvements on hardware and fiber technology, e.g.

- Microsoft is actively installing **Hollow-Core Fiber (HCF)** in its Azure infrastructure and announced at end 2024 the deployment of 15,000 km within the next two years. HCF aims at enhancing the performance and energy efficiency. Similar strategies by other leading hyperscalers are not yet disclosed. Among telcos in the APAC region, only China Telecom and China Mobile have yet disclosed their commitments and trials in this sector.

- AWS and semiconductor manufacturers have developed a **hybrid cooling system** combining air cooling with the “direct-to-chip liquid cooling” technique to remove heat more efficiently from processors.

- Leading hyperscalers are **designing their own hardware infrastructure,** e.g. chips like the Trainium2 by Amazon **to support AI growth,** including everything from everything from the silicon wafer to the server racks. In this context, besides optimized performance, also energy-efficient aspects play an important role.

- In late 2023, Google and its partners announced being the first to implement **MCF (multi-core fiber) technology in subsea cables** (connecting Taiwan, the Philippines, and the USA) to deliver higher capacity on these routes.

These are of course only a small selection of examples of commitments of hyperscalers, vendors and research institutes to increase computing power, energy efficiency, long-haul transmission speed and capacity. While commercial-scale deployment of next-generation fiber technologies such as HCF and MCF is currently being led by hyperscalers—most notably Microsoft and Google—telecom operators in the Asia Pacific region are also active in early-stage research and trials. Japan’s NTT has played a leading role in MCF development through its IOWN initiative, while China Mobile and China Telecom have reported successful HCF and MCF testbeds. These efforts, though not yet scaled, reflect the region’s strong R&D contribution to the evolution of optical infrastructure.

Co-opetition to leverage the digital transformation

For telcos, hyperscalers and their customers, the challenges of the digital transformation will not be solved by one single approach. Co-opetition is certainly a strategy that will be pursued by many actors, but with a panoply of methods and characteristics.

For example, since the early 2020s, **Telstra and Microsoft** have signed and extended several agreements, to push digital transformation in Australia, e.g.

- Microsoft becomes an anchor tenant of Telstra's intercity fiber network, e.g. used to extend its AI infrastructure. Boosting its capacity on Telstra's Asia-Pacific subsea cable network is explored.

- Telstra is choosing Microsoft as preferred cloud partner when transferring major parts of its internal IT workloads on public cloud infrastructure. Also, Microsoft services/licenses (e.g. Copilot in the AI sector) are used internally.

- A suite of Microsoft based digital offerings is designed and delivered by Telstra for businesses to foster hybrid working and cloud migration, combining Telstra and Microsoft services and offerings.

This is certainly a rather vast partnership with one single hyperscaler. Very often, telcos are pursuing a multi-partnership model, depending on concerned services and objectives, e.g.;

- In 2023, **Singtel and Microsoft** announced to incorporate Azure Public MEC (Multi-Access Edge Compute) into Singtel's 5G network and Paragon platform. In the same year, NCS, a Singtel company, announced a strategic partnership with **Google Cloud** to accelerate digital transformation by AI.

- **Telkom Indonesia** partnered with **Microsoft** in 2021/22 to increase both internal productivity and to push the digitization in the country (e.g. in using Telkom's hyperscale data center infrastructure). Since late 2024, Telkom is also partnering with **Alibaba Cloud** to strengthen the country's digital ecosystem.

- In 2023, Indonesian **Telkomsel** has chosen **AWS** Skills Guild to upskill employees in order to accelerate the digital transformation. Also AWS has been chosen as preferred cloud provider, Telkomsel migrating large parts of its IT applications to AWS. In 2024, Telkomsel announced a strategic collaboration with **Google Cloud** to integrate enterprise-grade gen AI into its operations and core product offerings

Together, these initiatives underscore a clear shift: digital infrastructure and AI services are no longer developed in isolation by individual players, but through **layered ecosystems of co-investment, platform integration, and shared innovation.** The future of digital transformation in Asia Pacific—and beyond—will be shaped not by rivalry alone, but by **how effectively telcos, hyperscalers, and technology providers navigate and operationalize co-opetition.**

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