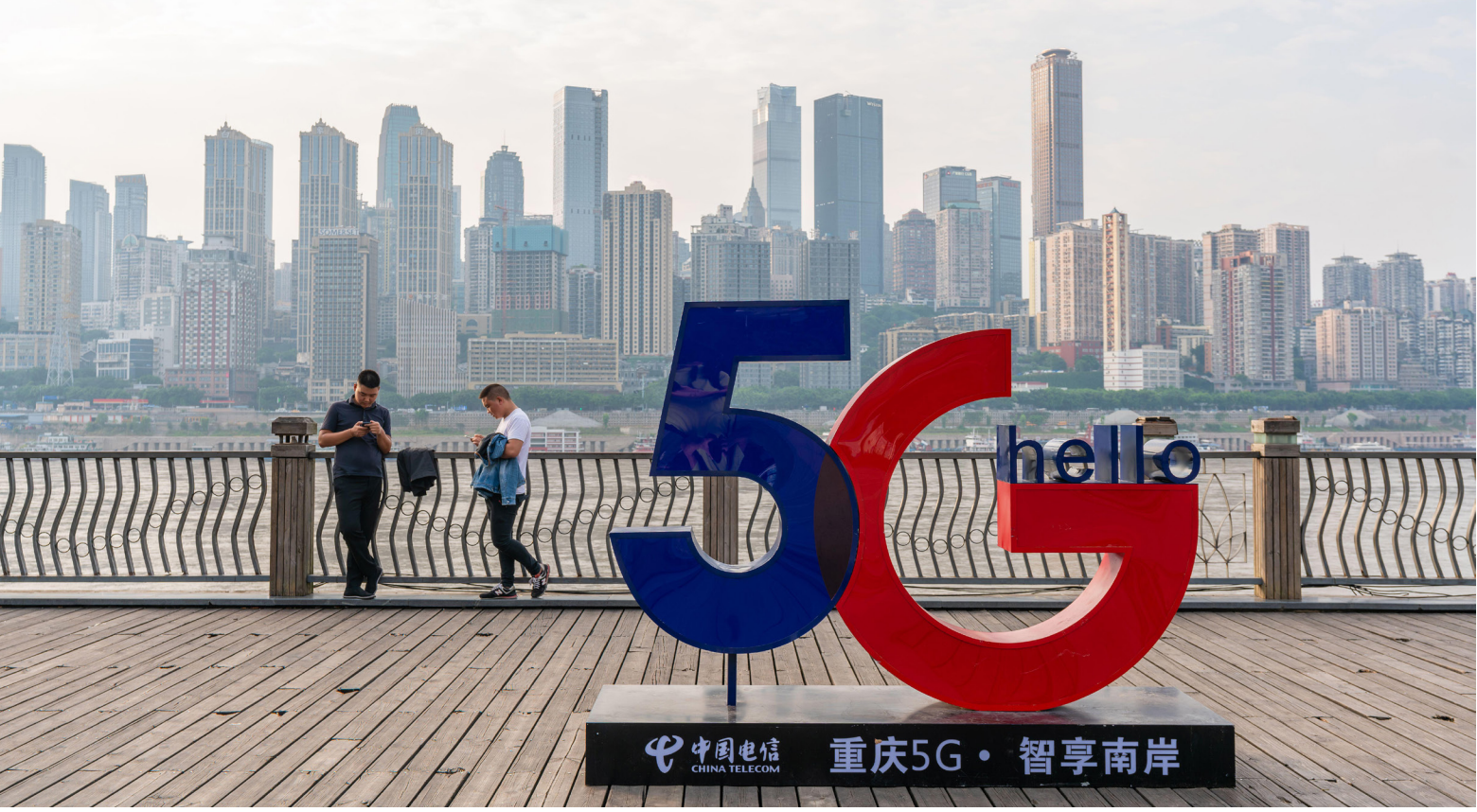


Are Data Centers Ready to Capitalize on 5G?

By Jordan Sutlive

Ever since it gained popularity towards the start of the pandemic, there's no doubt that 5G has made an immense splash on the public at large—even if its initial reception was marred by controversy. 5G's advancement of the global mobile network, with its enticing promises of ultra low latency combined with major increases in connectivity, resiliency, and network capacity, had some concerned that this would perhaps present cybersecurity- and even health-related issues to the global consumer market.

Yet, in order to properly assess 5G's impact on the data center industry, we must first strip away this needless hype and investigate what, exactly, distinguishes 5G from its previous iterations. What advantages can it offer that 4G and other past networks were never able to provide? How will its incorporation into a data center's infrastructure affect daily operations and overall performance?

These questions, it seems, must inevitably be posed, because it's become clear that 5G will increasingly become an attractive tool for industries across the globe. According to Omdia Research, "5G's impact in 2023 will be more widely felt as the technology matures and the business case enhances." Its influence is predicted to extend to disparate technologies such as telecomms, AR/VR, and multi-access edge computing (MEC), and its potential to enhance a given industry's sustainability initiatives will serve as valuable leverage for vendors to sell 5G to more and more enterprises.

And there's no doubt 5G will similarly transform the data center industry. "In my 43 years of the industry, 5G is one of the most dynamic, exploding, emerging technologies I've ever seen," said Mark Evanko, Founder and Principal at BRUNS-PAK, in an exclusive interview with AFCOM. "It brings data and processing to the edge in a way I've never seen before. It's just got tremendous capabilities to reduce communication distances and drive tons of revenue."

However, despite these myriad advantages, 5G's current "emergent" status means there's a possibility for the data center industry to fail to capitalize on its potential, or fail to avoid pitfalls that may cause costly financial losses or operational downtime. Therefore, it's clear that, in order to seize this current opportunity, data center operators must become better acquainted with this new technology—one of the very few that's captured the attention of the entire world.

The 411 on 5G

5G is, quite simply, the "fifth generation" of global mobile networks that were first

developed in the 1980s. 5G improves upon its predecessor, 4G LTE, which is commonly cited as the generation that galvanized the trend of mobile broadband adoption.

Rather than offering new services or functionality, 5G is most notable for its myriad improvements on connectivity, latency, capacity, reliability, and consumer UX when compared to past generations. In turn, 5G's holistic upgrade can itself usher in a whole host of other emerging technologies, including advancements in remote healthcare, "smart cities," cloud gaming, AR/VR, IoT, and transportation safety. Mark Evanko provided a hypothetical example in which a driver is stuck on the highway behind another car that suddenly, unexpectedly, slams its brakes. "If my car and the car in front of me are both connected to 5G, or I have edge compute processing," he said, "then our cars are now intelligent enough to communicate back and forth, and my car will be able to slam its brakes at the exact same moment as the car ahead does.

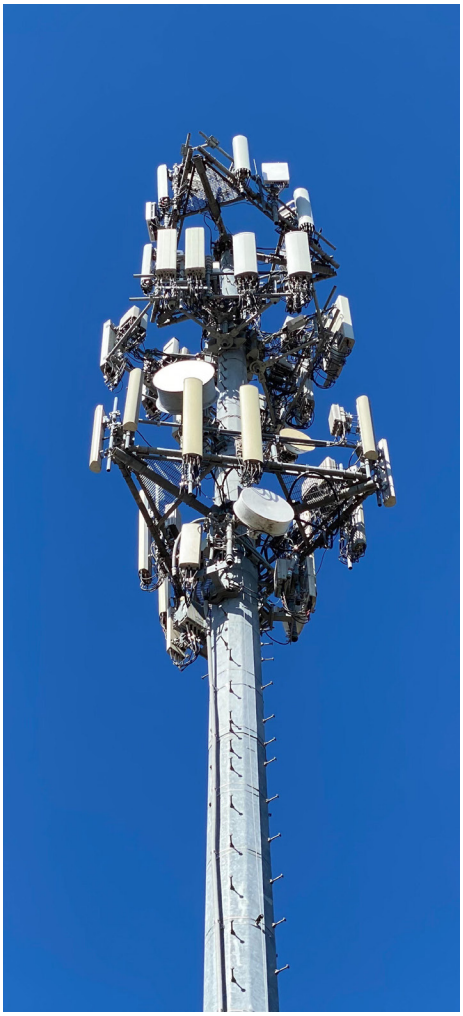
5G's impact also has the potential to cause monumental shifts in consumer marketing and outreach. Its considerable decrease of connection distances across networks allows telcos and other industries to access user information instantaneously—and advertise to said users accordingly. "Let's say you drive to a Burger King, for example," Evanko told me. "Companies will know you've indicated a preference online for Burger King in the past, and so will be able to send coupons and deals to you while you're waiting in line at the drive-thru. Or, if you're standing in front of a bank, and it's observably clear that you've hesitated in front of the bank for over 3.5 seconds or so, that bank will know you might be interested in starting an account there, and will reach out to you as a result. Basically, 5G is here to revolutionize the way that companies generate revenue."

Who Is (And Isn't) Adopting 5G

It's this allure of increased revenue and seemingly guaranteed ROI that has many telcos chomping at 5G's proverbial bit. Its overhaul of mobile broadband alone is enough to enable telcos to offer consumers 5G-centric mobile plans and 5G-only services (such as access to streaming media content), even if, as Omdia Research states, "there remains no stand-out consumer 5G service that has caught the mainstream consumer imagination."

Despite this scarcity of 5G-implemented use-cases, telcos seemingly haven't been deterred from encouraging users to opt into its network. Indeed, with telcos' eventual launch of 3GPP R16 5G technologies in conjunction with cloud and MEC, Omdia predicts that 5G's benefits will subsequently empower the type of services it can enable, which in turn will allow telcos to advertise more and more 5G-only services to its consumers.

Furthermore, it seems as though 5G might become the necessary catalyst for



hyperscalers to partner with—or even compete against—telcos. Hyperscalers can offer their ICT expertise and cloud services to entice telcos that are struggling to modernize their networks, and in turn utilize this leverage to ingratiate themselves further into the telecoms market. In fact, it's clear that this trend towards a hyperscale-telco partnership has already started to occur. In 2021, Omdia Research reported that Amazon, Microsoft, Meta, and Google had forged 176 network service partnerships, with an observable YoY increase of 89% for future partnerships.

However, due to 5G's comparative recency—according to Omdia, it's only been three years since the first 5G networks were launched—the rate of 5G adoption has been slow for industries other than telcos for the time being. Perhaps it's the relative lack of use-cases, or a common attitude that 5G's true potential is still untapped outside of enhanced mobile broadband. Whatever the reason, Omdia data indicates that "2023 is set to be the year … for more emerging market players to begin their move to 5G," partly due to factors such as the current near-capacity of 4G, the reduction in costs of 5G equipment, and the increasing desire from consumers for 5G-only products and services. Specifically, Evanko highlights the automotive, retail, "smart cities," and banking industries as four of the non-telco industries that are likely to lead the charge for greater 5G adoption in 2023.

It's important to note that these "emerging markets" not only include industries beyond telcos and hyperscalers, but also refer to telcos within global regions that may have yet to bolster their digitization efforts or otherwise make substantial investments in 5G. Telcos in the Middle East, North America, Latin America, and Africa, for example, had far fewer commercial 5G launches compared to their East Asian and Western European counterparts. In particular, Omdia indicated that "China continues to lead the world with the largest 5G network and 5G customer base," and predicted that 5G will account for nearly 60% of China's global connections by 2027.

5G's Impact on Data Centers

The hype that surrounds 5G and its enablement of other emerging technologies will no doubt financially impact the future of data and data centers. Gartner observed a potential 11.6% increase of data center investments from last year, up to $226 billion in 2022. According to Data Center Knowledge, this investment is in part due to this year's surge in 5G networks.

Yet this increased interest will no doubt correlate with an increased strain on data center operators to upgrade and expand their existing infrastructure. Tech Target declared that consumer demand for 5G will cause a dire need, for example, for more computing capacity, as well as more support for storage, connectivity, and edge computing. If, as Cisco predicts, 5G will support over 10% of the world's mobile connections by the end of 2024, it's imperative for data center operators to plan accordingly—to take proactive measures, such as deploying containerization and virtualization to scale, rather than take a "wait-and-see" approach and subsequently be left in the dust.

This emphasis on 5G support within data centers may also affect the future distribution and construction of data centers across the globe, with some outlets even indicating that it may "shake up" the current proportion of data centers per region. Spain's government recently announced its Digital Spain 2026 initiative, which seeks to provide 100% of the Spanish population with broadband coverage and accelerate the adoption of 5G technology across the nation. Consequently, this initiative, combined with Spain's efforts towards sustainability and renewable energy, has led the country to become "a leading contender for data center site selection," according to Data Center Knowledge. In fact, in 2022 alone, at least six hyperscalers and colos have either started or announced data center construction in Spain, with other companies not too far behind.

Investors, meanwhile, also look towards Japan and Hong Kong as fertile sites for future data center growth, due partly to Asia's overall "tech boom" and the subsequent increase in many East Asian countries' computing capacity and 5G adoption. Even though the U.S. currently accounts for approximately 40% of the world's larger data sites, global data center construction may perhaps shift its emphasis towards Asia and Oceania as demand for data centers in these regions is expected to skyrocket over the next five years.

However, although hyperscalers and colos might have driven the charge on data center construction to accommodate the potential explosion of 5G adoption, 5G itself might have the potential to "shake up" the current hierarchy and allow smaller data centers and data companies to also benefit from this emerging technology. As Evanko states, "People are going to want to get compute closer to their area, which means that [construction opportunities] may get taken away from some of the larger enterprises. This kind of decentralization will probably end up impacting a lot of the larger cloud and colocation providers as a result."

"5G is here to revolutionize the way that companies generate revenue."

In short, it's become clear that in order to attract investors and 5G vendors, governments should adjust their fundings to increase budgets on emergent 5G-only technologies and overall 5G adoption, and data center operators and managers should appropriately scale their existing infrastructure and operations to prove they're more than capable to handle the increased strain and capacity of 5G computing whenever a 5G service provider inevitably knocks on their door.

Conclusion

"Every industry is going to be touched by 5G at some point," Mark Evanko explained to me towards the end of our interview. "I think we're about to see an explosion of technological transformation. In the past 43 years I've been working, I've never before seen the amount of change I've witnessed in the past three to four years. And 6G's right around the corner."

Despite initial skepticism by consumers at large, the expected increases in 5G-driven revenue for most companies and industries across the globe will soon prove (if it hasn't already) that 5G is here to stay. As 5G adoption and implementation increases, so too will the potential for further advances in 5G-only technology and services, which in turn will drive growth in consumer demand for 5G accessibility and availability in their area.

As such, this ever-rotating cycle, in which 5G supply will drive 5G consumer demand, and demand for 5G in turn will spark a greater increase of 5G supply, provides an apt metaphor for the potential opportunity that data center operators can either capitalize on—or fail to catch entirely. Those who choose to watch 5G from the sidelines and not take the appropriate steps to adopt or implement it early may see the benefits of 5G technology wheel right past them. If, however, operators are smart and proactive in their initiatives to bolster and upgrade their existing infrastructure, they'll most likely be ready enough to seize control of this supply-demand cycle and go along for the ride.