HOW EDGE COMPUTING AND 5G ARE TRANSFORMING TECHNOLOGY

Clinton Keeler CTO & Co-founder, Zella DC

ZELLA DC™
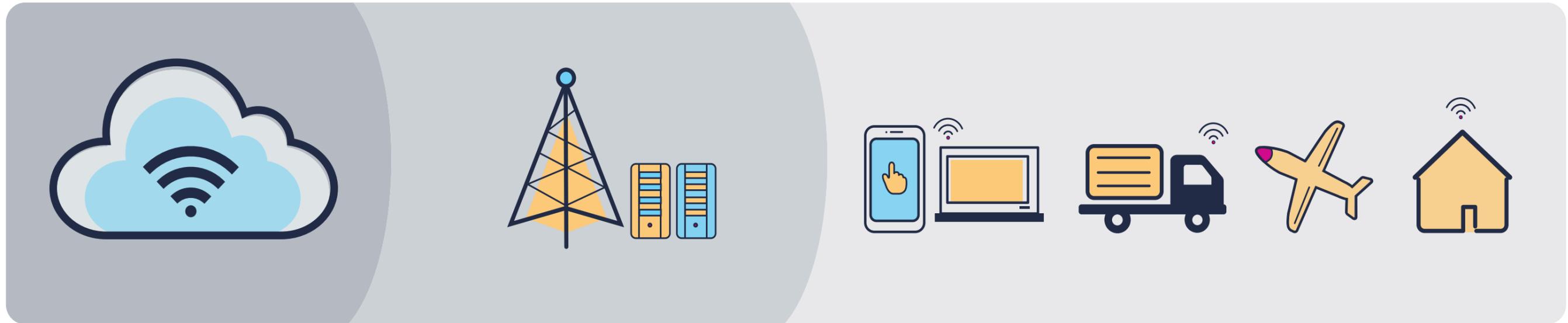
Industries impacted by 5g and edge computing

While it was slow to get started, 5G has recently gained traction in technology adoption. Over 75% of the U.S. population now has 5G coverage, and experts predict 2023 will be the tipping point in 5G coverage.

5G is not just an extension and improvement over 4G wireless. It comes with its own capabilities and infrastructure. Its high throughput and ultra-low latency enable operators to build edge computing that place computing resources at the edge of the network where the data originates. The rise of edge computing, along with 5G, is critical to the next stage of technological advancements.

How will this new collision of edge computing and 5G impact business? We've found the industries that will experience the most impact of 5G and edge computing.

How edge computing and 5g are transforming technology

5G and edge computing work together synergistically to amplify the effects of their technologies. Together, they provide significant improvements in application performance, lower latency, and allow an incredible amount of data to be processed in real-time.

Implementing edge computing amplifies 5G speed and reduces the round-trip data latency between mobile clients, the mobile network core, and cloud computing resources. This means that technology can work faster than ever and with fewer lags in service. Edge computing and 5G also enable more considerable amounts of computing to be offloaded onto mobile technology without the traditionally high expense. More devices will be connected to the Internet as the prices of sensors and computing costs continue to go down. These changes have exciting implications for many industries.

Energy

Protecting the environment while balancing the needs of society has been tricky for most of modern history. However, 5G and edge computing can lead to innovative solutions in the energy industry to reduce its overall environmental impact.

5G will provide more connected smart grids so that monitoring energy use will be more efficient and reduce both energy spikes and costs.

Downtime and slower connections currently get in the way of efficient energy management. However, 5G will allow the energy industry to quickly find issues and reduce downtime through the use of data and sensors.

The newest technology will also offer a stable supply of energy. Companies will have better insights about power distribution because of the enormous amounts of data they can glean from 5G-enabled sensors.

Also, better connectivity means that there is less waste. For example, streetlights that are equipped with sensors can dim if there is no one on the road. Accenture estimates that the use of 5G to cut down on waste could end up saving American energy companies $1 billion each year. Not only does 5G enable energy-efficient practices, but it is more energy efficient in general. Research from Nokia and Telefónica found that 5G is 90% more energy efficient per traffic unit than the networks that came before it. This means that it could significantly improve the lifespan of other battery-dependent devices by up to 10 years. This will make a mass deployment of computing edge sensors a much more practical solution than the previous networks.

The energy industry could also use 5G to maintain a more sustainable operation. 5G better supports the use of drones to manage critical elements of the power grid, like powerlines. This will increase grid uptime and decrease the costs of manual inspections.

Providing a more sustainable energy operation will transform not only the energy industry but also the planet.

Healthcare

The healthcare industry is already starting to utilize 5G and edge technology to provide a personalized approach to health care and enable patients to take their care into their own hands.

Wearable devices are transforming the healthcare industry. There were over 100 million Apple watch users in 2021, which allows individuals to track their exercise, eating, pulse, VO2, and other health markers. In addition, a number of wearables enable continuous glucose monitoring, monitor sleeping patterns, and more.

Healthcare providers use wearables to assess patients in their normal environment and provide more accurate feedback on their patients' health. Beyond wearables, edge computing and fast data processing enhance remote patient monitoring, medical management, and inpatient care.

These new technologies can also help bridge some of the gaps in the medical provider shortage. For example, it provides near-zero latency robot-assisted surgery so that doctors can perform surgery from thousands of miles away.

Privacy is another critical aspect of healthcare. Patient data in the cloud has led to concerns over the security and privacy of the information. Edge computing enables the industry to decentralize data processing and create a safer environment for sensitive data. Since the data is processed closer to the edge rather than sent to the cloud, there is a significantly reduced risk of improper access and data breaches.

Gaming

The gaming industry has had the earliest opportunities to make use of 5G and edge computing. Most specifically, it led to the rise of Augmented Reality (AR) and Virtual Reality (VR). In 2020 alone, users spent $4.5 billion on immersive games.

In the world of gaming, even milliseconds of delay are critical to the user's experience. 5G and edge computing enable a smoother and more interactive game experience. Gamers now have less lag with improved latency and speed. Reducing the time it takes for the player's command to reflect in the game is crucial to making games engaging. With the new technology, gamers can benefit from an increasingly immersive experience with life-like audio, responsive simulation, advanced haptic feedback, plus more.

Price can be a significant barrier to the wider adoption of immersive games. Users also won't need expensive equipment to get a rich and immersive experience with the improvements in technology.

AR and VR depend on 5G to provide a wider network with less latency and lower expensive to grow in popularity. As they need substantial amounts of data processing to run, 5G and edge computing will enable widespread adoption.

Retail

The face of retail and commerce is changing. Shoppers are increasingly opting to shop online as it has become a faster and more accessible option for most consumers. Mobile shopping, in particular, has become the hottest growing commerce trend. In fact, experts estimate that mobile sales will reach $436.75 billion by the end of this year.

5G and edge computing will help retailers meet this increasing need and provide consumers with a better shopper experience. With a faster connection and better access to smart technology, buyers can find what they need quickly and check out faster. Companies can collect more data to fine-tune their marketing and approach to better meet their customers' needs.

With 5G's lower latency, companies can also utilize AR/VR applications to their customer experience without the motion sickness common with 4G. Customers will be able to try on clothes from home, which will lead to a more personalized e-commerce shopping experience. This translates to more sales: one Deloitte survey found that 71% of buyers stated that they would shop more if they had an AR app.

Although mobile shopping benefits immensely from 5G and edge computing, in-store shopping will also improve. Smart technology enables merchants to monitor shelves and improve the check-out experience. Adobe Digital Insights estimates that this could increase revenue by $12 billion annually for retailers.

Many organizations are seeing the opportunity to improve retail operations. In fact, Verizon Business introduced a new 5G-enabled mobile edge computing (MEC) platform that they created in partnership with SAP and Deloitte. The platform will enable retailers to utilize real-time analytics of buyer behavior through sensor networks that combine AR and AI. It promises to help solve some of the most common challenges in retail, like inventory management in real-time.

By harnessing 5G-enabled edge computing, retailers will be able to improve their entire omnichannel experience to delight customers and improve sales.


Manufacturing

The smart factory, enabled by both 5G and edge computing, has completely transformed the manufacturing industry. The use of wireless technology enables automated alert systems that can identify any crucial issues or problems that require immediate attention.

Although smart factories have been increasing in numbers, 5G and edge computing will help manufacturers with the total capacity to handle all of the devices needed to create the most efficient operation. Previous networks limited how many sensors factories could have and the internet speed to improve productivity. However, 5G-enabled edge computing enables manufacturers to have the sensors to lower losses due to misplaced containers or manual inefficiency. Companies will be able to streamline more logistical processes, improve production, and lower overhead.

Transportation

One of the largest impacts of edge computing combined with 5G will be the rise of driverless cars. Self-driving cars contain a large number of sensors that enable vehicles to run. From radars to cameras to laser systems, these sensors allow faster response time by moving data processing closer to the car.
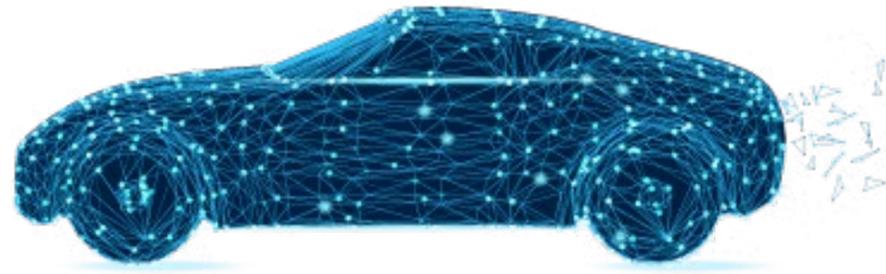
Although driverless vehicles are mostly reserved for high-end brands and luxury models, the technology is starting to gain traction, and organizations are planning for their eventuality across all models. The Automotive Edge Computing Consortium (AECC) recently announced that it would begin creating projects focused on connected car solutions. This alliance, founded by Toyota, includes AT&T, Intel, Ericsson, DENSO Corporation, and CISCO, among many other companies.

This shift in transportation is not limited to self-driving cars. Trains, planes, trucks, and other means of transportation not driven by humans all require large amounts of data processed in real-time. For example, the Bombardier C series aircraft uses edge computing to spot engine troubles by processing data in real-time. It is equipped with a multitude of sensors to find engine performance problems as quickly as possible.

The transportation industry increasingly utilizes 5G and edge computing to become safer, easier to use, and more agile.

Sports and Entertainment

With lower latency and faster data transfer, 5G and edge computing support a wide variety of entertainment experiences. From mobile view to VR to streaming services, the speed that they can add together is critical. Sport can become a more dynamic and personalized experience for viewers, whether or not they are in the stadium.

Already, video accounts for a large portion of mobile traffic. Currently, it is 69% of all mobile data traffic, and experts estimate it will be about 79% by 2027.

5G and edge computing will enable faster streaming, fewer delays, and less time downloading. The improved experience will create a massive boon for the media and entertainment industry. One Intel study estimated that it will result in a $1.3 trillion increase in revenue by 2028.

Not only will 5G improve the current video streaming capabilities, but it will enable new entertainment experiences. Holograms, avatars, and synthetic voices are emerging synthetic media forms thanks to edge computing and 5G.

Thanks to additional data bandwidth, sports watching will also become a more immersive experience. Viewers will have more options over the game presentation, such as selecting viewing angles to watch games. They may even be able to feel as though they are in-person with 5G-enabled AR/VR.

For the fans at the stadiums, more bandwidth, thanks to 5G, means having a more immersive experience. For example, fans can use AR to overlay the players' stats or even see instant replays while they watch the game in the stands.

5G might even transform how sports are played. 5G-fitted stadiums and facilities can utilize sensors and HD cameras to get insights into key aspects such as shot direction and arc and players' movements. This not only would affect how games are refereed but also player development, strategy, and more.

How Micro Data Centers Are Transforming Industries Through 5G and Edge Computing

Many industries will find themselves impacted to some degree with the rise in 5G. It enables enterprises to work faster than ever and makes the barrier to adopting new technology lower than ever. However, certain industries will find themselves completely transformed. Organizations that can recognize the value that 5G combined with edge computing can provide and are quick to adopt it will find themselves ahead of the curve and able to reap more benefits.

Embracing 5G and edge computing, though, means many companies need to rethink their data storage. Traditional data centers, such as AWS and Azure, were not created with the future of 5G in mind. They fail to bring data processing close to users for the distributed workload edge computing offers. Micro data centers are a critical way that organizations can utilize the low-latency of 5G combined with edge computing. They enable serves to get geographically closer to users, which makes them faster than ever.

Micro data centers provide a critical way for companies to adopt edge computing to further their 5G usage and improve their businesses. Here at Zella DC, our experts help organizations embrace the technological revolution with micro data centers. Curious how we can help you get ahead and transform your business? Contact us today!

ZELLA DC™

Over a decade ago Zella DC pioneered the micro data centre. Since then, our next-generation server room in a box have been proven to work in the harshest environments on earth. The result is a vendor-agnostic approach to software, hardware manufactured to global standards, and partners across six continents. zelladc.com

Clinton Keeler CTO & Co-founder

Clinton is an industry expert on micro data centre construction, edge infrastructure deployments and operating mission critical infrastructure at the edge. He is in charge of all research and development projects and his experience spans from remote environments to metro areas and everything in between.