# Transforming Network Trends into Opportunities

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The pandemic has changed how we live, work, and play as many of our day-to-day activities have moved online and we are now more reliant on broadband connectivity than ever before. To keep up, our home networks must meet new bandwidth demands driven by a proliferation of users and devices all connecting during peak hours.

At the same time, the pandemic showed that industries that had already digitalized—think finance, entertainment, and retail—were best equipped to meet the demands of the pandemic. Physical industries such as manufacturing, warehouses and logistics, mines, and ports are now seeking to digitalize their operations to take advantage of more automation and remote control.
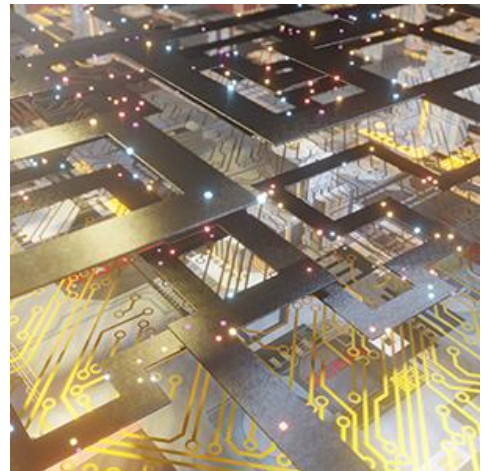
Both trends provide significant opportunities for communications service providers (CSPs) to deliver increased coverage and capacity to their residential and business customers, as well as to provide new revenue-generating services. CSPs can take a number of steps to differentiate their service offerings and to ensure that they capitalize on these opportunities.

Focus on outcomes, delivering connectivity and new services

Traditionally, communications service providers delivered the "pipe" that brought Internet connectivity to the home or business or that delivered cell service to a mobile device. CSPs were focused on delivering speed, while over-the-top (OTT) players leveraged these "pipes" to offer

revenue-generating entertainment services such as Netflix, messaging services such as Skype or WeChat, and video conferencing services such as Zoom.

Now, with hyper-connectivity the norm and 5G networks being deployed globally to keep up with high-bandwidth, low-latency requirements for new applications and IoT devices, CSPs have an opportunity to deploy new value-added services to their customers in addition to the network itself. Rather than just competing on speeds, they can now offer services that help them differentiate from other service providers and from OTT players as well.

For residential customers with multiple family members now simultaneously working, learning and being entertained at home, CSPs should offer new services that enhance the connected home experience. For example, smart home services offer an attractive revenue growth area in the near and long term. CSPs could become a one-stop-shop by offering to their customers smart home bundles that provide smart devices such as appliance, sensors and security cameras that connect to their network.

For business customers, CSPs can offer audio and video conferencing services and collaboration tools that can be accessed on a wide variety of devices, differentiating the meeting experience with enhanced security and virtual assistant capabilities.

CSPs are also partnering with enterprises and industry verticals to deploy private networks that leverage a variety of spectrum options such as CBRS in the US and locally licensed spectrum that has been made available in the UK and Germany. Many of these networks will be deployed via small cells. According to the Small Cell Forum Market Forecast 2021, the fastest growing segment of small cell deployment will be in private enterprise networks led by automotive and manufacturing industry verticals.

Deliver an intuitive network that understands customers' demands

As technologies such as artificial intelligence and machine learning mature, networks are becoming more intuitive. If the network knows that a family of four will be online between 8am and 5pm each day on multiple simultaneous video conferences, it can ensure that enough bandwidth is available. At the same time, CSPs have access to tremendous amounts of data running over their networks. Using analytics, this data could be harnessed to provide more insights into customers' wants and needs, but how this data is collected and stored must be carefully handled to protect privacy.

As artificial intelligence applications have more access to big data, they open even more possibilities for new services. For example, CSPs can create and deploy personalized AI-powered video bots that can provide real-time personal interaction with customers. Companies can also create "bots" to represent their senior leadership or to leverage celebrities as brand ambassadors. These "bots" can be programmed torespond to any inquiry; in "reality" they can be programmed to say anything. AI-based tools can also be subject to inaccuracies and biases.

CSPs that deploy such tools can reap many benefits but also need to be aware of the ethical challenges inherent in using AI.

Find new synergies with cloud providers

With the advent of 5G and the move to open software-based networks, there is an increasing focus on the convergence of telcos, enterprise and hyperscalers. By leveraging the cloud, service providers can embrace edge computing to move processing closer to the devices and support new immersive experiences that require ultra-low latency. These new latency-sensitive applications include live multi-player gaming, live video streaming, autonomous vehicles, machine learning at the edge, and augmented and virtual reality.

To monetize this emerging market for edge-based applications, CSPs and cloud providers such as AWS, Microsoft Azure and Google Cloud are partnering. CSPs can readily build, deploy and scale 5G optimized services, while leveraging the compute, storage and networking capabilities at the edge offered by hyperscalers. CSPs and hyperscalers are already joining forces to enable on-premise private networks for smart factories, connected hospitals, entertainment venues and more.

Address security and privacy in a hyperconnected world

As the world is increasingly digitalized, maintaining the security and privacy of data is more important than ever. New regulations such as GDPR (General Data Protection Regulation) in the EU were put into place to protect personal data and to regulate how it is used and transferred.

New technologies such as artificial intelligence and machine learning can improve user authentication security. AI-powered computer vision and speaker verification capabilities can enable authentication systems to use biometric traits to solve common password problems like vulnerability, frequent changes, complexity, and length. With biometrics, face or voice identification cannot be duplicated, forged, or forgotten, and it can be used across any connected service.

Rather than relying on the end devices to implement these authentication services, CSPs can prevent unauthorized access to data by using these technologies to deploy in-network real-time voice and video analytics in a scalable and cost-effective manner. CSPs can quickly and efficiently process speech and video streams that enable these reliable biometric authentication services.

Open networks built from a growing multi-vendor ecosystem

In 2022, we will continue to see the shift to building networks with open hardware and software components to take advantage of a larger multi-vendor ecosystem, reduced costs, and reduced time-to-market. GSMA is embracing this trend at MWC Barcelona with its Open RAN Summit at

the upcoming event. Service providers are also continuing to lead many of the workgroups of the open industry organizations such as the O-RAN Alliance, Open Networking Forum, Open RAN Policy Coalition, the Small Cell Forum, and others.

Governments are also becoming more engaged in supporting investments in connectivity solutions to bridge the digital divide, and ensure security of networks, as well as support research in next-generation 6G wireless technology. In the U.S., the FCC developed the Rural Digital Opportunity Fund to distribute more than $20B to fund deployment of networks in regions without broadband service. The Rip & Replace program was designed to provide funding to service providers that need to modernize their legacy equipment with new gear from a trusted vendor ecosystem. CSPs can apply for these programs to build trusted networks that are critical to bridging the digital divide.

2022 Network Trends and Opportunities

The opportunities for communications service providers have never been greater. New technologies such as artificial intelligence, machine learning, and computer vision are enabling CSPs to deliver new revenue-generating services that meet their residential and business customer demands. New partnerships with hyperscalers are enabling the move to edge computing applications for ultra-low latency applications. And new specifications and architectures from leading global industry organizations are enabling CSPs to leverage a multi-vendor ecosystem to build their next-generation networks with best-of-breed components. Now is the time for CSPs to make the most of these opportunities.