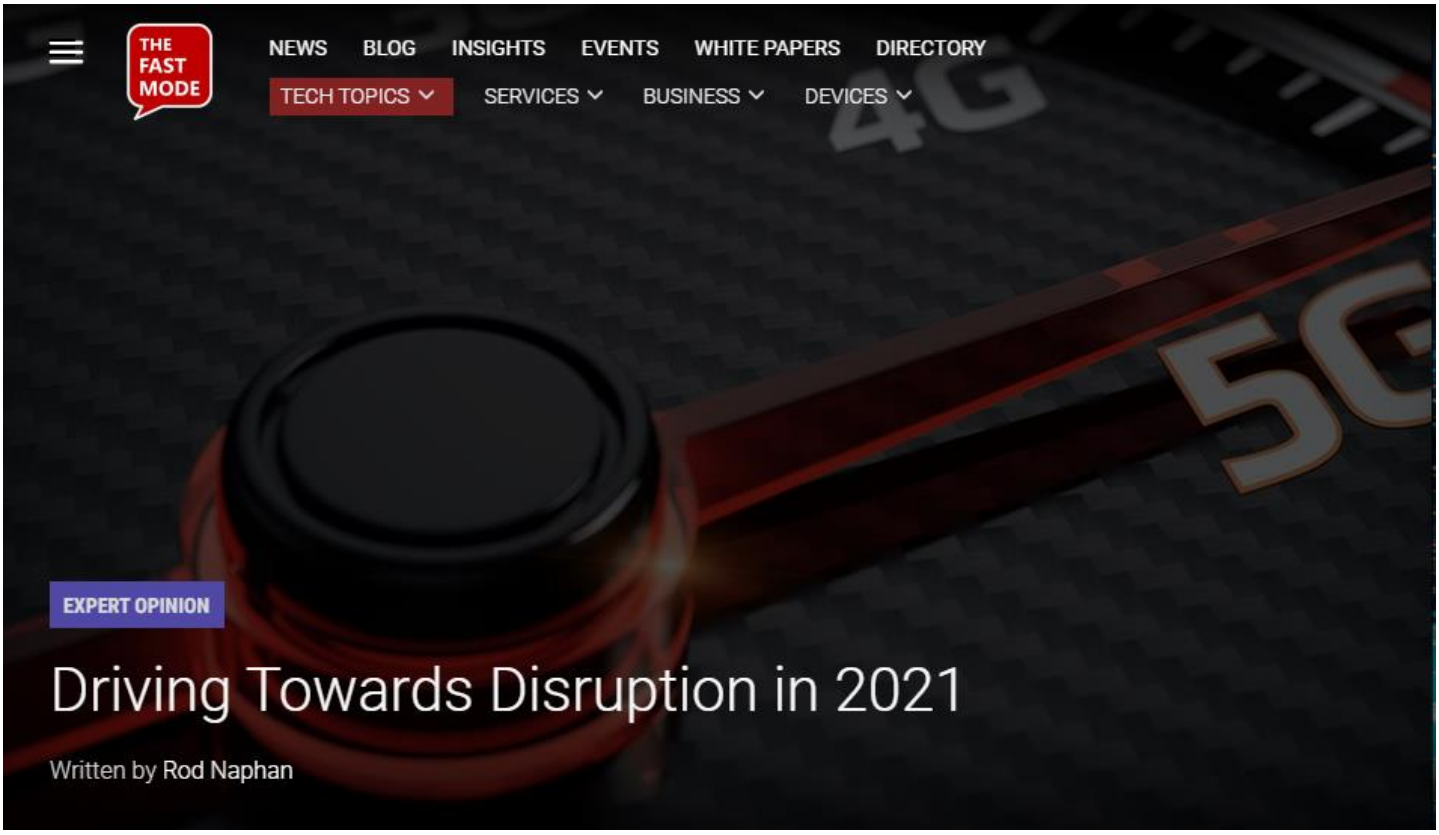

Driving Towards Disruption in 2021

As demand for ubiquitous, high-speed wireless and wireline connectivity continues to escalate, communications service providers (CSPs) are turning to digital transformation and open, cloud-native technologies to help them optimize the customer experience. Looking ahead to 2021 and beyond, the pace of this transformation will continue to accelerate as CSPs strive to solidify their market positioning, particularly in next-generation network architectures such as public 5G, and new network operators appear with the rise of private 5G.

#1: 5G POWERS DIGITAL TRANSFORMATION

With 5G network rollouts gaining momentum, we can expect to see profitable, new use cases ramping up in the coming months. Beginning in 2021, we also expect to see an acceleration of private 5G networks. While these implementations began this year, they were primarily deployed by European manufacturers and government organizations. However, this trend will begin to expand with advancement of 5G technology offering greater availability, more bandwidth, lower latency and, most importantly, 5G-enabled devices.

Low latency and massive machine type communications (mMTC) will enable connectivity for IoT, spurring digital transformation through ‘smart’ infrastructure for both urban and rural applications. And in the workplace, 5G will empower social innovation including sustainability, work life balance, diversity and inclusion. As wireless networks begin to deliver higher throughput and lower latency, private 5G will be able to service complex mission-critical use cases as well, such as asset and uptime assurance or operations visibility. In fact, private 5G offers significant potential for many vertical sectors.

#2: CLOUD DISRUPTION SOARS HIGHER

CSPs are adding cloud capabilities to the existing network to maximize service delivery, contain operational expenditures (OpEx), and preserve network investments. As the pace of this technology-led disruption accelerates, CSPs will be better able to adapt traditional business models to a disruptive future.

Network automation enabled by artificial intelligence (AI) and machine learning will see greater adoption as the network continues its cloud transformation journey. However, the ability to fully leverage those investments will be gated by labor and workflow processes. The transformation to new, more efficient processes has to happen simultaneously while continuing today's operations uninterrupted in order to maintain legacy network architectures and service delivery. To do this, the workforce will need to transform, learning new skills that enable the transition from 'doing' to managing bots or software.

At the heart of the telco transformation to virtualized and cloud-native architectures is the evolution to open interfaces that enable scalability. Open networks enable CSPs to avoid vendor lock-in and integrate the latest technology, as well as solutions and components that offer the greatest value. In 2021, investments in open network infrastructure, such as Open Radio Access Network (O-RAN) and Open Optical & Packet Transport (OOPT) technologies, will ramp up and become significant in North America. O-RAN deployments, in particular, could represent between 10-20% of wireless network spend in 2021.

#3: PLUGGABLE OPTICS PICK UP SPEED

For the past 20 years, networks have largely been built with routers and switches interconnected by Dense Wavelength Division Multiplexing (DWDM) technology. High-speed applications like video streaming, industrial IoT, 5G backhaul and cloud services are causing bandwidth to grow in excess of 35% per year, straining legacy networks. To accommodate the speed, performance and economic requirements of future networks, CSPs are looking to update their network architectures to 400G+ technologies using pluggable coherent optics (PCOs) enabled by the 400ZR and ZR+ standards.

We anticipate that ZR/ZR+ optics will move into production in 2021, with larger volumes and economies of scale to follow in 2022. The forthcoming year should give us more clarity into whether this generation of optics, when paired with packet networking equipment, can truly deliver on the anticipated value proposition of IP-over-DWDM. If so, this will be one of the biggest networking developments in the metro data center interconnect segment - and potentially the carrier metro market as well - since the early 2000s when DWDM first penetrated carrier metro markets.

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