Dec 26, 2020, 04:39pm EST | 1,997 views

5G: What Can We Expect For Next Year?



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The Apple iPhone 12 Pro Max at the Apple flagship store during a product launch event in Sydney, ... [+] © 2020 BLOOMBERG FINANCE LP

During the past few weeks, the bids for 5G wireless spectrum have totaled nearly \$70 billion, which significantly exceeded expectations. While the main bidders included the mega carriers like Verizon and AT&T, there was also likely participation from satellite operators and cable companies.

"5G is the 5th generation of wireless technology, paving the way for the Fourth Industrial Revolution—an era of technology-led disruption and innovation with the potential to transform the way people work, live, and play," said Frank Boulben, who is the Senior Vice President of Consumer Marketing and Products at Verizon.

He notes we'll see innovations like:

- · Instant View: Stream 4K movies with virtually no buffering
- True Chat: Video chat in HD with near zero lag
- Responsive Gaming: Console quality multi-player gaming you can play on the go
- · Flash Loading: Downloads that used to take minutes now take seconds
- Real Response: Augmented reality that responds in near real-time

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But really this just scratches the surface. The impact of 5G will be wideranging and long-lasting.

So then as the new year approaches, what are some of the things to expect? Well, here's a look:

Jefferson Wang, who is Accenture's 5G global offering lead:

"We will see more consumer devices add 5G connectivity, compute power and storage to create more stand-alone devices in the form of wearables (e.g., watches), hearables (e.g., ear buds) and head-mounted displays (e.g.,

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glasses). We will move devices closer to consumers where the data is generated."

Mary Beth Hall, the director of wireless strategy at Panasonic System Solutions Company of North America:

"Pre-pandemic, smart cities were all about cloud computing, and information could go right to the edge. Post-pandemic, and on the journey to 5G, this conversation will evolve into instant two way communication and feedback between devices, strengthening people's ability to feel comfortable, safe and protected."

Craig Sutton, the Manager of Advanced Manufacturing Innovation at John Deere:

"Businesses in rural counties will also adopt 5G for new applications such as real-time location systems, asset tracking, inventory management, wearables, building automation, and robotics for overall cost savings. Given the foundational infrastructure is advancing with technologies such as 5G, we expect to see more applications which can simultaneously collect larger amounts of data and leverage Machine Learning and Artificial Intelligence. We also foresee an increase in autonomous mobile robots which will assist worker productivity."

Jeff Ready, the CEO Scale Computing:

"5G will likely increase the amount of storage and connectivity needs at the datacenter to accommodate this new wave of communication and data collection. The increased connectivity and workload demand at the edge will open entirely new approaches to how organizations interact with the edge."

Kon Leong, the CEO and cofounder of ZL Tech:

"Today's queasiness of being surveilled by facial recognition on city streets is nothing compared to being tracked every step of the way, every minute of the day. Oversight of 5G applications, including stringent restrictions on the use of the mountains of data generated, will be key to enabling its societal benefits without free-falling into '1984.'"

Caroline Chan, the Vice President and General Manager of the 5G Infrastructure Division in the Network Platform Group at Intel:

"In the new year, enterprises will work diligently to implement 5G technologies to make the use cases the industry's been teasing for years a reality. We have heard from CIOs at a variety of large enterprises that they are willing to spend 5% percent to 10% of their budget on the technology, as 89% of those we spoke to saw 5G as a requirement or at least something they'd prefer to implement. This investment will start to shift the broader perspective that 5G is only for your smartphone, and instead, people will begin to realize the greatest impact will be in the enterprise."

Raj Singh, the Executive Vice President of Processors Business Group at Marvell:

"Private networks and/or network slicing are examples of a new type of offering that will allow network operators to monetize their investments in 5G network infrastructure by providing the type of dedicated services businesses are willing to pay extra to receive. Other opportunities exist in improved remote work experiences, remote shopping (including in real estate) and many other areas."

Sanjeet Pandit, the Senior Director of Business Development and Global Head of Smart Cities at Qualcomm Technologies:

"The proliferation of 5G, coupled with the necessary safety measures including social distancing and health screening caused by the pandemic, is causing an inflection point that will drive forward both IoT commercialization and smart city implementation during 2021. 5G's high connectivity and low latency allows multiple smart devices to connect and

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interact with each other in real-time–an integration that will continue to grow throughout next year."

Jake Moskowitz, the Head of the Emodo Institute at Ericsson Emodo:

"In the consumer world, we'll see interactive gamification of experiences, more augmented reality, 3D, 360 degree content and advertising, real-time collaboration, and better personalization as a result of better AI algorithms fed by real-time data. The fact that the iPhone 12 is 5G-capable across all key frequency levels, along with 5G being integrated into virtually every major new Android device, means the addressable market for these types of consumer experiences will cross the chasm very shortly, in turn spurring better content development and the necessary infrastructure upgrades."

Jonathan Nguyen-Duy, the Vice President of the Global Field CISO Team at Fortinet:

"Cybercriminals will certainly also look to leverage the power of 5G. One of the most significant advantages to cybercriminals is that while all of these edges are interconnected, many organizations have focused on performance and digital transformation to the detriment of centralized visibility and unified control. 5G networks that are not secured with a broad, integrated and automated security fabric often contain gaps in visibility and control. Additionally, bad actors are looking to evolve their attacks by targeting these environments and will look to harness the speed and scale that 5G will make possible. Indeed, we're beginning to see attacks occurring at faster speeds, challenging security teams to detect and mitigate faster than ever before."

Jason Shepherd, the vice president of Ecosystem at ZEDEDA:

"In 2021, we'll see new types of applications around Augmented and Virtual Reality. We'll also start to see 5G small cells replace wired communications in neighborhoods because it can provide higher bandwidth than landlines and without the expense of running cables to every home."

Gianfranco Lanci, the Corporate President and chief operating officer at Lenovo:

"In the commercial sector, we will start to see Network-as-a-Service solutions that bundle IT hardware and services to better support the workfrom-anywhere movement. Industrial and enterprise organizations will also build on-site 5G networks for mission-critical functions and to boost digitalization of critical infrastructure, enhance security and put in place backup options outside of Wi-Fi."

Atul Bhatnagar, the President and CEO of Cambium Networks:

"The capabilities of 5G fixed networks will enable more low latency experiences in the home, such as AR/VR and live streamed video games. Many of the consumer devices will be connected to high-speed WiFi (currently WiFi 6) rather than 5G mobile, particularly when indoors. In those cases, the consumer may not even know it's 5G because, like a lot of things, it's in the plumbing that they don't see. Yet it is the 'plumbing' that is the first big opportunity for 5G rather than consumer mobile."

Kishen Mangat, the Vice President and General Manager of Service Provider Mobility and Automation at Cisco:

"While recent CBRS auctions are a good start, C-band spectrum is crucial for 5G development—it's relatively cheap, easy to deploy and provides fast speeds with reliable coverage. Look for telecoms and service providers to invest in the frequency in 2021."

Raj Talluri, the Senior Vice President and General Manager of Micron's Mobile Business Unit:

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"As 5G becomes a reality and the cultural shift toward social distancing lingers, we could see it enabling 4K/8K high-resolution video for telemedicine, personalized AI-based teachers in virtual classrooms, and lagfree Zoom meetings. In 2021 and beyond, 5G might power inventive contactless experiences in retail and hospitality, and interactive sporting and entertainment experiences. Imagine immersive, 360-degree, virtual experiences for football, all enabled by six cameras shooting the same scene, with a machine processing together these feeds to allow viewers to watch the game from different angles in real-time."

Dan Hays, a Principal at PwC:

"As the first generation of 5G-capable smartphones wind their way into consumers' hands, we are already seeing how 5G raises the bar versus older networks in terms of performance. In 2021, we expect to see this extend to services such as cloud gaming, where more realistic, interactive, multiplayer games can become a reality on mobile devices. We also expect to see other new categories of services, such as augmented reality, be enabled by the responsiveness and bandwidth offered by 5G connections. Finally, highspeed 5G connections are already being used to expand access to broadband services in homes and this should continue to grow quickly as the technology becomes more widely available."

Mark Wright, the Director of Marketing for AI Processors at GSI Technology:

"In 2021 we will start to see experiments with 5G to enable things such as better cold freight tracking. We have seen Pfizer COVID-19 vaccines shipped with GPS and temperature sensors—what about tracking temperature in real time? We'll also start to see integrations with IoT, Blockchain, and smart sensors make way for better tools for things like farm-to-factory food tracking and low-cost, real-time sensor inputs for enterprise analysis."

Steve Alexander, the Chief Technology Officer at Ciena:

"Almost as soon as talk of 5G networks first started, so too did questions about what the killer app for the new standard will be. 2021 might not be the year we get the definitive answer to that question, but it will be the year in which enhanced reality (AR and VR) applications take a step forward. However, it may not be consumer-centric services that light the path, but instead enterprise use cases that could lead the way."

Theresa Lanowitz, the Head of Evangelism at AT&T Cybersecurity:

"Standalone 5G will be more secure than any previous network generations. Yet, expanded attack surfaces mean opportunity for new threats as well as proliferation of unpatched existing threats. With 5G, a shared security model, similar to that of the public cloud, is likely to emerge. This should enable enterprises to shift certain functions to carriers and ultimately heighten enterprise security."

Tom (@ttaulli) is an advisor/board member to startups and the author of Artificial Intelligence Basics: A Non-Technical Introduction, The Robotic Process Automation Handbook: A Guide to Implementing RPA Systems and Implementing AI Systems: Transform Your Business in 6 Steps. He also has developed various online courses, such as for the COBOL and Python programming languages.

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