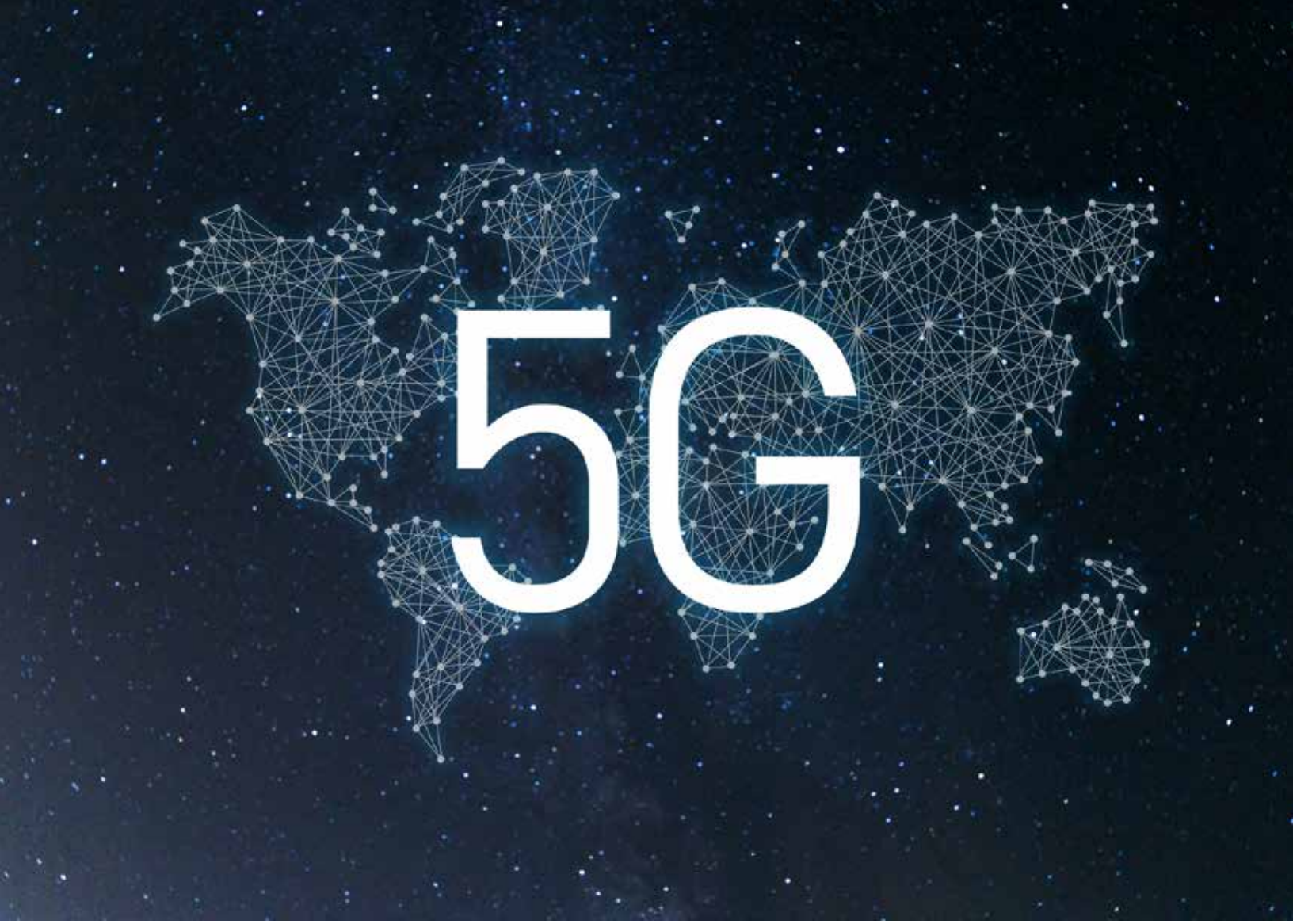

FUTURE OF 5G: PROJECTIONS, ROLLOUTS, USE CASES, AND MORE

July 2020

TechRepublic

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INTRODUCTION

The number of active 5G connections around the world hit 63.6 million as of the first quarter of 2020, a jump of 308% from the last quarter of 2019, according to data from research firm Omdia. Globally, the number of 5G connections are projected to reach 238 million by the end of 2020, with North America accounting for 10 million of them.

According to Gartner, the market for 5G infrastructure is expected to hit $4.2 billion this year.

Whether users realize it or not, 5G will change their lives with its promise of low latency and high bandwidth. This ebook from TechRepublic reports on 5G's impact with content detailing 5G use cases, rollouts, and what industries will benefit most from the technology.

REPORT: THE HYPE AROUND 5G SHOULD BE TAKEN SERIOUSLY

While a global survey shows overall excitement over 5G cellular communication, the US has been slower to get on board, according to a survey by Ansys.

BY HOPE REESE

IMAGE: HQRLOVEQ, GETTY IMAGES/ISTOCKPHOTO

As the coronavirus pandemic has forced businesses to shift operations from the physical to virtual world, the demand for strong connectivity has never been more critical. A recent survey from Ericsson found that 5G subscriptions were predicted to reach 190 million by the end of the year — and by 2025, they're expected to hit 2.8 billion.

A new survey released on Tuesday from Ansys confirms that the hype around 5G should be taken seriously. The survey, conducted from March 10-13, looked at the global attitudes of more than 16,000 adults — from the UK, US, France, Sweden, Japan, India, China, Germany, Austria, and Switzerland — around the development of 5G, and what it means for the enterprise.

5G technology is significantly faster (more than 10 times faster) than 4G LTE—whereas, its predecessor hits its limit between 300 Mbps and 1 Gbps, 5G boasts speeds of 1 to 10 Gbps.

While 41% percent of respondents see 5G as having a positive impact on the economy—the majority response—there's still a learning curve: More than a fifth of respondents don't know what 5G even is.

And the enthusiasm varies by geographic region. In the US, only 34% view 5G as having the potential to positively impact the economy, versus 81% of those surveyed in China. Further, only a quarter of Americans see 5G as a significant improvement over 4G, while 77% of those in China and 75% of Indian respondents regarded it this way.

Those surveyed reported a wide range of time frames that they predicted 5G would be accessible. Those who said that 5G is more than a year out composed 42% of total global respondents, but China and India were more confident that it would arrive within the next year— each at 85%.

The perception of the overall benefits of 5G also varied by nationality. The global average was that 30% of those surveyed believed that 5G's benefits are being overhyped. But in China and India, 75% said that the hype is warranted.

Respondents were queried about their health concerns over 5G technology, which varied by generation as well as nationality. Millennials were more likely (28%) than baby boomers (13%), to report health concerns. Nearly half (44%) of Indians believed it would negatively affect their health, whereas only 25% of Germans shared these concerns.

5G ROLLOUTS GROW AMID COVID-19 CRISIS

As of the first quarter of 2020, more than 63.6 million 5G connections were active throughout the world, according to 5G Americas.

BY LANCE WHITNEY

IMAGE: ISTOCKPHOTO

The coronavirus pandemic has stifled progress in many areas. But one technology that has continued to grow in the face of the pandemic is 5G. A report released Wednesday by industry trade group 5G Americas tracks the growth of 5G rollouts.

The number of active 5G connections around the world hit 63.6 million as of the first quarter of 2020, a jump of 308% from the last quarter of 2019, according to data from research firm Omdia. There are now 82 5G commercial networks in the world, a level expected to more than double to 206 by the end of the year, according to research from TeleGeography. Further, more than 100 commercial 5G device models are now available, according to the Ericsson Mobility June 2020 Report, with many offering support for low-band, mid-band, and millimeter (mmWave) frequency bands.

Among specific regions, North America had 1.18 million 5G connections at the end of the first quarter, a gain of 591,000 5G connections from the previous quarter. Over the same time, Latin America and the Caribbean saw 3,004 5G subscriptions, a gain of 142%. However, 5G adoption in Latin America and the Caribbean has been hampered by the coronavirus.

"The impact of COVID-19 is finally being felt by Latin America's and Caribbean's telecom industry," Jose Otero, vice president of Latin America and Caribbean for 5G Americas, said in a press release.

"The decrease in remittances arriving from Europe and North America together with the mandatory lockdowns imposed by many regional governments decreased the purchasing power of a large percentage of the population."

To combat the effects of the coronavirus, some governments in Latin America and the Caribbean have adjusted the taxes and terms required by communications services.

"The lack of devices due to global logistic obstacles has resulted in negative subscriber growth and slower uptake of newer technologies," Otero said. "It is expected that until the situation normalizes all spectrum assignment processes would be delayed and that no new networks would be launched during this period."

Globally, the number of 5G connections are projected to reach 238 million by the end of 2020, with North America accounting for 10 million of them, according to Kristin Paulin, senior analyst at Omdia. Latin America and the Caribbean will account for an additional 270,000 connections. Paulin said she expects growth to pick up over the second half of 2020 as coronavirus lockdowns ease, 5G networks expand, and more 5G devices become available.

5G PROJECTED TO SURPASS 190M SUBSCRIPTIONS GLOBALLY BY END OF 2020

Solid connectivity will be key to the economic recovery after COVID-19, Ericsson found.

BY MACY BAYERN

Global 5G subscriptions are expected to hit 190 million by the end of 2020, an Ericsson report found. In 2025, 5G subscriptions are forecasted to surpass 2.8 billion, indicating a growing demand and reliance on connectivity.

IMAGE: OLIVIER LE MOAL, GETTY IMAGES/ISTOCKPHOTO

The coronavirus pandemic added urgency to the need for connectivity. With the majority of businesses forced to work remotely or virtually, network infrastructures were put to the test and the need for high-speed, low latency, reliable connection became clear.

Ericsson's Mobility Report, released on Wednesday, analyzed the state of connectivity during this unprecedented time and drew conclusions on the future of networking. While 5G was already on its way, COVID-19 undoubtedly accelerated its journey as connectivity was pushed to the limit.

IMPACT OF COVID-19

During stay at home orders, communications service providers saw a sharp shift in traffic moving from the office space to suburban residential areas. This significant change resulted in service quality degradation as professionals flooded networks during peak hours, the report found.

Mobile traffic also spiked, up to as much as 70%. In areas with limited penetration of fixed residential networks, mobile data demand was especially severe, forcing service providers to push networks to their limits.

Video calling, in particular, rose dramatically. Prior to the coronavirus, users hadn't fully embraced video calling. However, social distancing has made video calling the norm, whether it be for business meetings, group projects, classes, virtual happy hours, or family gatherings. As many as 85% of consumers now use video calling, the report found.

Across the world, 83% of survey respondents said that information and communications (ICT) technologies helped them cope with the impact of the pandemic. ICT provided children with access to education (76%), helped family stay and friends stay in touch (74%), and allowed professionals to do their jobs (67%), according to the report.

Fixed broadband also surged. The daily time consumers spent connected to fixed broadband increased by two and a half hours during the crisis, and the time spent connected to mobile broadband rose by an average of one hour per day.

Markets with limited fixed residential networks particularly valued mobile broadband connectivity. In India, for example, 33% of respondents said mobile broadband was more important than fixed. Some 37% said they most often rely on mobile broadband to connect at home, the report found.

TURNING TO 5G

This increasing reliance on connectivity has resulted in more consumers focusing on the future of 5G. During the time of crisis, consumer expectations for better network experiences were bolstered. Some 60% of smartphone users said they had a clear positive attitude toward the role 5G could have played during the crisis.

Nearly half of respondents strongly agreed that 5G could have offered both better network capacity and higher speeds compared to 4G. Overall, respondents believed society as a whole would have benefited hugely from 5G, according to the report.

Commercial 5G providers are paying attention. Two package types related to 5G consumer use cases—device-based and fixed wireless access (FWA)—showed marked growth. The number of service providers with commercial 5G offerings grew from 26 in the previous study to 55 in the latest, the report found.

Once 5G is ready for widespread use, subscriptions will not be a problem, according to the report.

5G subscription update is expected to be significantly faster than that of LTE in 2009. Key contributing factors include China's earlier engagement with 5G compared to 4G (LTE), and the earlier availability of devices by several vendors.

In 2025, the majority (88%) of subscriptions are projected to be for mobile broadband. Currently, there are approximately 8 billion mobile subscriptions, a figure that will reach 8.9 billion in the next five years.

The report surveyed regions in Sub-Saharan Africa, Middle East and North Africa, Latin America, India, South East Asia and Oceania, Central and Easter Europe, Western Europe, North East Asia, and North America.

By 2025, 5G will have a presence in every region, particularly in Western Europe (55%), North East Asia (60%), and North America (74%), the report found.

FWA is also expected to increase substantially by 2025. In the time frame, connections will grow threefold, reaching 160 million and accounting for 25% of the total mobile network data traffic globally. As more people work remotely, this type of connectivity will become even more critical, the report found.

Mobile traffic also grew significantly during COVID-19, at a 56% increase. By 2025, 5G will account for approximately 45% of total mobile data, which makes sense as smartphones have traditionally been at the epicenter of 5G development, according to the report.

The enterprise, providers, and consumers alike are recognizing the vitality of 5G. Because of this, companies are pushing for the rapid development of the next generation of connectivity. With this momentum in mind, 5G is projected to cover up to 65% of the world's population in 2025.

HOW 5G AND WI-FI 6 WILL SPEARHEAD THE FUTURE OF REMOTE WORK

Telecommuting is here to stay, and advanced connectivity will be the guiding light.

BY MACY BAYERN

GETTY IMAGES/ISTOCKPHOTO

Remote work is the new reality. With some states still seeing an uptick in coronavirus cases, employees are realizing they may be working from home longer than they expected. This means that meetings held via video conference and conferences hosted as webinars may be commonplace for a while.

Some argue that remote work is the future of work, and that the coronavirus has only expedited its popularity.

"Remote work is absolutely here to stay," said Mick Slattery, president of CompuCom. "We're going to see more than ever movement between locations. Sometimes I'm remote, sometimes I'm in the office."

Telecommuting presents some concerns, however. Worries associated with security, visibility, and communication are common, but networking and connectivity remain paramount. Professionals can't work remotely if they don't have the connectivity and infrastructure to do so.

Working in and out of the office, Slattery said, "means I'm going to have the same level of expectations regardless of where I am, and my IT administrators are going to have to support me the same way, regardless of where I am."

IT teams are looking for ways to bolster connectivity, with 5G and Wi-Fi 6 top of mind.

Slattery said that tech professionals have long heard about 5G and its potential impact on field workers. While 5G's potential on that scale is still there, Slattery said that there are even greater use cases right ahead.

"I have heard about or experienced calls where people are concerned about if others in the house are on the Wi-Fi at the same time they're trying to conduct something," Slattery said, or they are concerned if their

internet goes down. "For some organizations and some people in particular, when your Wi-Fi goes down during the middle of a super critical event call, maybe even a board interaction, that's highly problematic."

THE POWER OF 5G AND WI-FI 6

"[Wi-Fi 6] and in particular 5G provides us better redundancy," Slattery said. "Most of our offices don't rely on just one network connection, but most of our people working from home are relying on one network connection. How do we make sure that the people who need to be productive and uninterrupted have the right resiliency? 5G would play a huge role in that."

The main appeal of 5G and Wi-Fi 6 are the fast speeds and reliability, said Jim Slowik, vice president of tech sales at CompuCom.

"Wi-Fi 6 and 5G offer the same synergy around the fact that it's all about lower latency, better resiliency, some load balancing, and some of that seamless integration between those technologies," Slowik said. "When one might take a dip, the other one picks up. That's the stuff that I think is going to be groundbreaking for the new Wi-Fi."

This tech is also helpful from a security side, Slattery said.

"From an IT perspective, it also enables some higher order security capabilities," Slattery said. "[It lets] you look at some of these devices that are more software defined, WAN-type devices that can extend the security perimeter out to the home and how 5G can help play a role in that."

5G and Wi-Fi 6 will be beneficial across industries, but especially with those that have highly distributed locations, whether it be manufacturing, retail, offices, and the like, Slattery noted.

"Think branches, think smaller offices, and you can think of industries from different aspects of financial services, including insurance; you can think of real estate, even retail," Slattery said. "5G has the potential to be a very quick way to extend network coverage and also provide added redundancy into those locations without a lot of additional infrastructure."

For more, check out 5G rollouts grow amid COVID-19 crisis on TechRepublic.

MANUFACTURING MAY TAKE THE LEAD WITH 5G EXPANSION AS CONSUMER ROLLOUT SLOWS

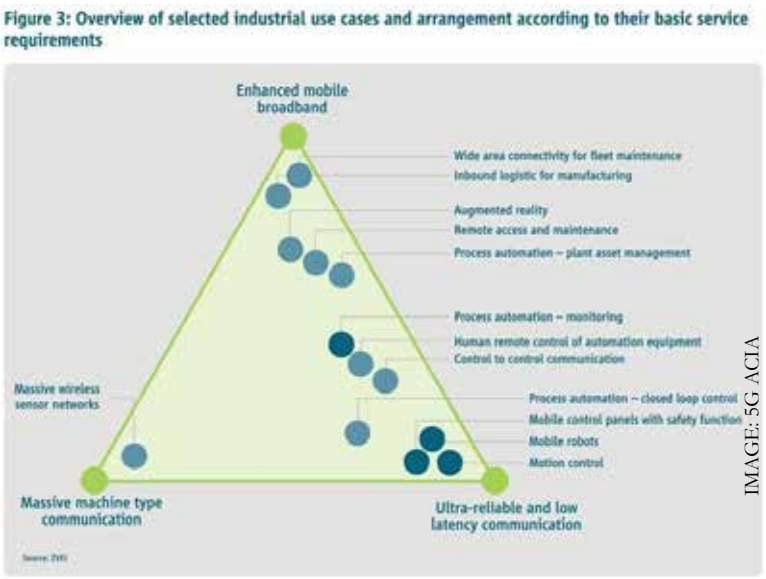
Qualcomm and Nokia have laid the groundwork with factories to use 5G and private networks to support digital transformation.

BY VERONICA COMBS

At a JPMorgan conference this week, Verizon CEO Hans Vestberg announced that the company's Home 5G service would be delayed until early 2021. Apple is expected to delay by a month the launch of its first 5G iPhone.

Bill Menezes, a director analyst of sourcing, procurement, and vendor management at Gartner, said the 5G rollout in the US is being impacted to a certain degree by the COVID-19 pandemic.

Installation projects already in progress will continue, but there are barriers to new 5G construction.



In the white paper, "5G for Connected Industries and Automation," the 5G Alliance for Connected Industries and Automation provides an overview of 5G's basic potential for the manufacturing sector and outlines relevant use cases and requirements.

"Where local municipalities have to furlough or cut employees due to dwindling tax revenue, it's likely that zoning and permitting are among the affected operations, potentially exacerbating any slowdown," he said.

Menezes said that telecoms may take advantage of this delay to skip non-standalone 5G infrastructure and wait until they can focus on standalone 5G equipment that should provide a more significant performance over 4G.

As the coronavirus slows down 5G rollout somewhat in the consumer sector, manufacturers may make more progress with the faster and more reliable connectivity.

Federated Wireless, a pioneer in the newly available Citizens Broadband Radio Service (CBRS), is partnering with Amazon Web Services and Microsoft Azure to offer CBRS connectivity-as-a-service. The unique connectivity service should help enterprises more easily deploy private 4G and 5G networks for IoT tools.

ABI Research predicts that wireless connections in factories will grow faster than fixed line connections between 2019 and 2030, with 4G reaching 11.96 million connections in the digital factory and 5G hitting 5.23 connections by 2025.

In Germany, manufacturers are deploying 5G on private networks without a telecom operator and Britain started a similar process last year to sell licenses for companies' 5G networks. The US hasn't opened up applications for 5G spectrum licenses to industrial companies.

Shamik Mishra, vice president of research and innovation at 5G design and engineering firm Altran, said that although 5G will accelerate coverage and connectivity in a post-Covid-19 world, there are several delays in the expansion at the moment. These include device readiness and changes in spending plans.

"5G supply chains particularly for radios have been impacted by the delays caused by the pandemic and lockdowns," he said. "Some countries have even put 5G spectrum auctions on hold - including India which did so today."

While developing 5G use cases and devices, John Smee, vice president of engineering and head of 5G R&D at Qualcomm, said that it has worked with more companies outside the wireless ecosystem than ever before.

"We want organizations to be able to deploy cellular networks for a smart campus, factory, or hospital," he said.

As the wireless industry embarks on a decade of 5G growth, this groundwork with other industries may pay off sooner than anticipated, particularly as manufacturers face intense demands for smarter supply chains and more flexible production lines to survive during the coronavirus epidemic.

5G IN MANUFACTURING

There has been a lot of talk about how 5G will support the industrial Internet of Things with faster and more reliable connections. Smee said that the company has spent a lot of time discussing use cases with factory owners, including GE, Honeywell, and Bosch, to understand their communication needs today and in the future. Qualcomm also has been working with governments and the automotive ecosystem to discuss smart intersections and other connected city projects.

"We've done a lot of end to end work to prove out use cases internally but also to work with external partners," he said. "We're working with academics and startups also to understand who is having problems today to learn where we can steer the technology today to address those needs."

Smee said that while developing 5G use cases, Qualcomm has worked with more companies outside the wireless ecosystem than ever before.

"We want organizations to be able to deploy cellular networks for a smart campus, factory, or hospital," he said.

5G COULD MAKE AR MAINSTREAM

Tingfang Ji, senior director of engineering, Qualcomm Wireless R&D, said that the reliability and low latency of 5G connections could power a broader adoption of augmented reality (AR).

Increased consumption of data led to the 4G boom expansion and optimized for a rich smartphone experience, he said.

"AR is in some sense the next user interface following the multitouch interface of the smartphone," he said.

This expansion would require ubiquitous 5G coverage and the low latency that comes with those connections.

"5G is the missing link to make it a reality," he said.

STRONGER NETWORKS WILL POWER DIGITAL TRANSFORMATION

In late 2019, ABI Research and Nokia surveyed managers and plant directors in the manufacturing industry to gauge their plans for upgrading communications networks. The survey found that manufacturing leaders are planning to digitize existing infrastructure and increase automation. The responses showed that:

- 74% plan to upgrade their communications and control networks in next two years
- More than half believe 4G/5G necessary to meet transformation goals
- More than 90% are investigating use of 4G/5G for their operations

Dave Nowoswiat, a senior product marketing manager at Nokia, said the company has been talking with manufacturing leaders to understand their digital transformation plans and how 4G and 5G connectivity support those goals.

"They need to connect as much as they can possibly connect, collect performance data, and then analyze it in a meaningful way," he said.

Nowoswiat said that 5G will give factory managers the same level of performance that fixed wireless provides currently.

"Most everything is connected with ethernet connections now, so to be able to add mobility into your factory, you will need tech that is as good as ethernet and that's where 5G comes in," he said.

Now that CBRS spectrum is available, private companies will be able to build their own private networks using this spectrum.

"This gives them the ability to provide ultra-reliable connectivity and good security because all of their intellectual property and operational data is all contained locally within the confines of their own facilities," he said.

Nokia has worked with Nippon Steel on a IoT project to monitor the health of workers in the plant. Sensors on employee uniforms track gas, noise, and temperature and workers also have video cameras on their helmets. The helmet also has a network connection so employees can be connected to a remote tech support center if they need guidance when performing maintenance or other tasks.

Nowoswiat also said that 5G networks will improve communication with a factory that covers acres of land.

"Being able to communicate with employees and monitor them by having connectivity all over the premises is another important use case," he said.

Sylvia Lu, head of cellular technology strategy at u-blox, said that 5G will complement existing technology instead of replacing it because manufacturing plants have such a range of connectivity requirements. U-blox builds wireless semiconductors and modules for consumer, automotive, and industrial markets to cover a variety of functions, including:

- Monitoring and maintenance
- Logistics and warehousing
- Human machine interface
- Process automation
- Factory automation

Lu said that factories need to do more than just connect sensors.

"New use cases require mobility and that's where 5G comes into play," she said.

Existing 4G connections can manage measurement data from temperature sensors but 5G is required to enable ultra reliable low latency communications across an entire plant.

VERIZON'S 5G BUILD ACCELERATION CONTINUES

New developments include a virtual lab to speed 5G development, the debut of the 35th Ultra Wideband city, and new ecosystem partners to extend the reach of mmWave.

BY N.F. MENDOZA

GETTY IMAGES/ISTOCKPHOTO

Verizon's 5G build acceleration continues, and on Wednesday, Verizon announced that it created a new virtual lab to speed 5G application development. It also revealed that on May 28, San Diego will be the company's 35th 5G Ultra Wideband city, 5G uploads are now available in all markets, and Verizon added 5G ecosystem partners to help extend the reach of mmWave.

The virtual lab will help speed development of 5G solutions and applications for consumers, businesses, and government agencies, the company said. Verizon currently has seven 5G labs in the US and UK, designed as incubators. Because of how the global pandemic changed how nearly everyone works, Verizon adapted the lab environment into a virtual space, which will also be used to host virtual conferences, demonstrations of new solutions, and host "impromptu brainstorming sessions." Verizon's recent acquisition of BlueJeans technology will play a vital role in bringing the virtual lab to life, a press release noted.

VERIZON 5G ULTRA WIDEBAND AVAILABLE IN SAN DIEGO MAY 28

The California destination-city of San Diego, home to a world renowned zoo, as well as a famed marine-animal water-park, will be the 35th US city to have Verizon 5G Ultra Wideband mobility service. Verizon 5G Ultra Wideband impacts public safety, health care, sports, and other diverse industries. It will be concentrated in parts of Mission Valley near Westfield Mission Valley and SDCCU (San Diego County Credit Union) Stadium, Linda Vista along Linda Vista Road, Kensington near El Cajon Blvd, and in Banker's Hill on 1st Avenue.

When customers venture out range, the 5G-enabled device transitions to Verizon's 4G LTE network.

5G UPLOAD AVAILABLE

Starting Wednesday, the uplink for 5G uploads is available on Verizon and customers can upload content using Verizon 5G Ultra Wideband. Verizon estimates customers should expect upload speeds on 5G approximately 30% faster than on 4G LTE.

5G upload is available in the 35 Verizon 5G Ultra Wideband cities, in the Chicago 5G home market and in any stadium or arena with Verizon 5G Ultra Wideband service.

PARTNERSHIPS

Also, Verizon announced partnerships with the Movandi Corporation, Pivotal Commware, and the Wistron NeWeb Corporation (WNC). It said the partnerships will facilitate extender technology to amplify millimeter wave coverage in public spaces and in homes, buildings, and more. Extenders will work, Verizon assured, inside and will allow more customers to add devices to the network and enhance millimeter wave coverage at outdoor locations.

Additionally, Verizon has partnered with Movandi, NXP, and Qualcomm Technologies to develop chipset technology to enhance experiences and expand coverage for 5G home customers.

OPENSIGNAL'S LATEST 5G ANALYSIS

OpenSignal's latest 5G analysis is out, and reported that Verizon 5G users experience significantly faster speeds than any other in the study. The study examined 10 5G operators in four leading countries: Australia, South Korea, the UK, and the US. OpenSignal also found that Verizon is the only one to exclusively use mmWave spectrum, the main reason for the extreme high speeds 5G users have observed on the network.

Verizon's average speed was at 506.1, up from 27.4 with 4G a year ago and the second, LG U+ (South Korea) was at 238.7, up from 45.8 with 4G, and one year ago. The bottom three providers on a list of 10 countries which were 5G download tested were Sprint, AT&T, and the lowest was T-Mobile, at 47, up from 27.3 on 4G, a year ago.

VERIZON DEVELOPS 5G-ENABLED EMS SOLUTIONS WITH ITS FOURTH FIRST RESPONDER LAB

Using 5G capabilities, the latest cohort is working on innovations like smart dispatching, remote monitoring, and real-time medical collaboration.

BY MACY BAYERN

IMAGE: ISTOCKPHOTO/LIGHTFIELDSTUDIOS

Verizon announced the focus and members in the fourth cohort of its 5G First Responder Lab on Thursday. This year's group of innovators will develop 5G solutions to directly support the EMS and patient journey, using Verizon's 5G Ultra Wideband network.

"What we're focusing on is everything from before something bad happens, to getting better visibility into what's happening, all the way through the emergency response, and then all the way through to treatment," said Nick Nilan, director of public sector product management at Verizon. "How do they get from the incident back to the hospital in a connected experience? How do we do that all on 5G?"

Verizon received 60 submissions and to the program selected the following companies to be part of this latest 5G First Responder Lab cohort: Biotricity, Rave Mobile Safety, DispatchHealth, Vuzix, and Visionable.

Each company specializes in different innovations. Biotricity focuses on real-time remote medical monitoring; Rave Mobile Safety brings a critical communications and data sharing platform; DispatchHealth offers on-call medical care to your door; Vuzix optimizes augmented reality to better inform first responders; and Visionable has a platform for real-time medical collaboration.

Equipped with those specialites, the companies are teaming up over the next six months to develop 5G solutions that ultimately make the job of EMS individuals more efficient, connected, and effective, Nilan said.

"We wanted to really take the time with this one and spend just about six months actually working with these companies, rolling up our sleeves together, and building a solution," Nilan said. "What we hope to deliver is that end-to-end solution at the end of that cohort-—— solution that showcases what 5G can deliver for EMS through that entire journey."

WHAT IS THE 5G FIRST RESPONDER LAB?

Nilan has been the executive sponsor of the 5G First Responder Lab since the first cohort in early 2018.

"[5G First Responder Lab] is really an opportunity for us to inspire the market to do more with 5G than just neat consumer applications," Nilan said. "There's going to be a lot of applications for consumers on 5G, but we wanted to make sure public safety, first responders, and emergency services had access to the innovation that we've seen from technology over the last couple of decades."

Each cohort focuses on different types of solutions associated with first responders. Examples of past lab projects include drones that help route first responders during natural disasters and CBRNE sensors to better secure cities, according to Nilan.

"The difference in this year's is it's focusing on a specific part of the public safety community. One that really has been struggling with a heavy workload, especially during COVID-19," Nilan said.

"Oftentimes, they have a lack of vital information. They don't always know all of the details: What they're driving to, what they're around when they arrive on scene," Nilan noted. "We saw this as a real opportunity to focus on a specific part of the public safety community and deliver a better experience, to hopefully, at the end of the day, save lives."

The idea for the fourth cohort actually started in Q4 of 2019, before the coronavirus pandemic hit.

"What we wanted to do coming into this year was really focus that innovation in a specific area. And then when COVID happened ... obviously, we saw the impacts there," Nilan said. "The choice to support the EMS community with a new 5G solution was validated.

"This is a community in need of solutions and technology to help them with their day-to-day mission. We're very excited about being able to build an end-to-end solution that hopefully addresses that," Nilan added.

Verizon is currently accepting applications for the fifth cohort of its 5G First Responder Lab, which focuses on fire responders and situational awareness. The fifth cohort participants will be selected at the end of 2020.

For more, check out Verizon's 5G build acceleration continues on TechRepublic.

NOKIA: TOP 5G USE CASES FOR THE ENTERPRISE AND CONSUMERS

Video and fixed wireless access (FWA) are leading the push for 5G, unlocking advanced capabilities for professionals and everyday users.

BY MACY BAYERN

IMAGE: ISTOCKPHOTO/WOOYAA

5G is on the horizon, and the possibilities are endless. Nokia released new research on Wednesday highlighting the outlook for 5G on the enterprise and consumer sides. Both audiences are ready to harness the power of 5G, particularly when it comes to video and fixed wireless access (FWA), but the road to the full capabilities of 5G is only beginning.

The report was conducted before the outbreak of COVID-19, however, the pandemic only bolsters the need for 5G and its use cases, said Josh Aroner, vice president of marketing for Nokia's communication service provider (CSP) business.

"We conducted this survey just ahead of the pandemic. In many cases, the way that service providers are looking at 5G is that 5G doesn't go away because of the pandemic," Aroner said.

"But, the way that we define it, or the ways in which things like a focus on digitalization or automation, will become more of an emphasis as they look at things like physical distancing or the need to do remote monitoring, or as more of us continue to work remotely," Aroner added.

5G is becoming more of a reality, with new use cases constantly surfacing. However, deep familiarity with the tech varies, the report found.

CONSUMER AND ENTERPRISE FAMILIARITY WITH 5G

Enterprise professionals are very familiar with 5G, while consumers lag behind, the report found. Despite this, consumers are still excited about the prospect of this tech.

"65% of these IT decision makers already have solid awareness of 5G. A third of them are using it today and

nearly half, 47% of them, are really starting to plan their 5G deployments," Aroner said.

More than half (54%) of enterprise respondents said they are waiting for more widespread 5G availability before they make plans, and 30% of enterprise users said they would prefer a better understanding of the value of 5G before adopting a strategy, the report found.

"The only thing that we see holding them back is the view that, 'We're just waiting for 5G to become more available,'" Aroner said. "We're still early on here in the shift here."

Only half of consumers said they had any level of familiarity with 5G. While familiarity is on the lower end, the majority (80%) of those familiar with 5G find it appealing, compared to only 23% of those who are unfamiliar, the report found.

More than half of smartphone owners said they will likely switch operators if their current provider doesn't offer them 5G in the next 12 months, indicating consumers do view 5G in a positive light.

"On the consumer side, most of us intuitively or instinctively know we want it, but we still can't necessarily tell you what it is or what I'm going to get," Aroner said. "There's still quite a bit of education to be had. Generally, people view it as 'I'm getting faster speeds, better quality,' which is all true, but they haven't gotten to the point of really understanding all the things you could do."

Regardless of familiarity, the consumers who have used 5G see the value: Nearly two-thirds of early 5G users said they were highly satisfied with the speeds they experienced, compared to less than half of 4G users.

TOP 5G USE CASES ACROSS THE BOARD

Both video and FWA proved to be significant use cases for enterprise users and consumers alike, the report found.

Video

"Across the board, video is the killer app for 5G—for enterprises and consumers," Aroner said. "But what that looks like may be very different from those two audiences."

For the enterprise, video was popular across verticals and business sizes, with 83% of enterprises finding 5G-enhanced video "compelling," and 48% citing 5G video monitoring as a near-term opportunity, or possible in the next four years.

The majority (83%) of enterprise respondents found video alerts such as detecting and recognizing who is on premise as a valuable capability for business, according to the research.

"The whole notion of video from a remote control machinery standpoint is appealing, [with] 77% of enterprises interested," Aroner said. "Video is such a powerful medium for us, and the applicability of being able to use really high-performance, high-quality video for surveillance monitoring and so forth is very compelling for the enterprise."

Video is incredibly important to consumers also, especially when it comes to communication—a factor that was boosted by the pandemic, Aroner said.

The research found that 90% of consumers rated high-quality, uninterrupted video streams as a "very valuable" aspect of 5G. Some 66% of consumers also cited video capture and streaming applications as appealing, and 69% found video detection and alerting appealing.

5G-enabled video is not just limited to improved video streaming or video chat applications, it is so much more, said Patty Wong, director of market insights for Nokia's CSP business.

"You could do things like live stream from your son's soccer game to a bunch of your family members," Wong said. "Or it could be an ambulance that is taking a CT scan quickly and sending that to the hospital before they even arrive."

"Those types of intense video applications, or even combining analytics so that you could do real-time monitoring and see that grandma fell in the home and it sends a proactive alert," Wong said. "Right now, it's all more reactive and based on Wi-Fi. It doesn't have recognition or anything. It's more advanced video applications than just streaming Netflix."

Fixed wireless access

"Fixed wireless access is something that's appealing to both enterprises and consumers," Aroner said. "This is a wireless replacement essentially for your broadband connectivity."

FWA was the top use case for small and midsize businesses, with 73% showing a strong interest in FWA if cost and performance match their existing wired broadband service, the report found.

"If you look at medium-sized enterprises, one of the interesting things that came up is that fixed wireless access becomes a really nice way to mitigate risk," Aroner said. "They look at it as a secondary source of connectivity that prevents any type of risks that might be out there. Considering how dependent we are on connectivity these days, they're always looking for risk mitigation."

On the consumer side, FWA ranked as the top use case, with 76% of consumers overall regarding FWA as the most appealing application. Some 66% of consumers said they would subscribe to 5G FWA if it cost the same as their current broadband service and delivered the same or better performance.

Currently, 41% of consumers said they only have one option of a single broadband provider, indicating a significant lack of choice, the report found.

"With the current environment that we're in, we've been again reminded of the criticality of connectivity. In many regards, it's an instigator for innovation, a catalyst for innovation here," Aroner said.

"If you look at the consumer experience, any minute now my kids will be going on their machines and this phone quality could become quite impacted," he added.

Wong emphasized the value of fixed wireless when it comes to widespread connectivity across the globe.

"In the context of where we are today, if you think about the digital divide that we even have in our country, there are metropolitan areas and deserts where people don't have access to broadband for their kids' remote schooling," Wong said.

"But, there's been studies that have shown that lots of people have smartphones," Wong noted. "In the future, could fixed wireless access be an easily deployable mechanism or method to allow underserved populations quick access to broadband?"

Some 45% of consumers also cited connected car concepts appealing, with navigation and safety capabilities unlocked by 5G as most valuable. That number jumps to 73% of vehicle owners, the research found.

"These cycles take time," Aroner said. "We already did see the cycle accelerate pre-pandemic, where we were having rollouts in US cities all over and devices are still coming. We have to remember that the 5G standards are still in finalization."

"We will continue to see our customers eager to roll this out. And given the current circumstances, [providers] are not slowing down what they're doing there," Aroner said, "We don't see any real change in timeframes, but let's also realize this is a several year process of coming out into the market, and it also varies by country significantly."

ERICSSON LAUNCHES STANDALONE 5G ON EXISTING HARDWARE WITH A SINGLE SOFTWARE UPDATE

All Ericsson radio system equipment deployed since 2015 is capable of transitioning to standalone 5G New Radio starting now.

BY BRANDON VIGLIAROLO

Networking Hardware manufacturer Ericsson has released a software update that will allow existing Ericsson hardware manufactured since 2015 to transition to standalone 5G New Radio (NR).

IMAGE: SARAYUT, ISTOCKPHOTO

Most current 5G deployments have been hampered by the need to use 4G LTE as an under layer (non-standalone, or NSA 5G). Standalone 5G, on the other hand, eliminates the need for an LTE backbone and should increase speeds and 5G reach as a result.

"This will allow service providers to add 5G NR to existing 4G sites with a simpler architecture, or deploy 5G independently in new areas such as factories, to support enterprise applications and services," Ericsson said in a press release.

The software update for existing Ericsson devices is designed to improve low-latency networking applications, like AR and VR, autonomous vehicles, and smart factories. "With a super-fast response time, a standalone 5G NR device can connect six times faster to a standalone 5G network than a device operating in NSA mode," Ericsson said.

Ericsson's highlighting of business applications of standalone 5G isn't accidental: This software update allows existing Ericsson hardware to operate on two out of three bands of 5G, low and medium, but doesn't include high band.

5G's three bands are designed for different applications, and as such deliver varying speeds and coverage radii. According to networking industry organization GSMA, the three 5G bands all have important, but differing, roles to play:

- Low-band 5G have wide area coverage, enabling edge computing and Internet of Things (IoT) systems in rural environments or in large cities. The trade-off for low-band 5G is that it's not nearly as fast.
- Mid-band 5G encompasses most current or planned 5G networks, and operates in a happy medium of speed and range. Speeds of mid-band 5G networks can vary between 100 and 400 Mbit/s.
- High-band 5G, also known as mmWave, typically only has around a 1,500-foot range. The trade off for the shorter coverage radius is super fast speeds, with current mmWave systems able to reach up to 1.8GB/s.

High-band 5G will likely be more useful as a last-mile service or in urban 5G cellular deployments where radios can be close to each other to prevent drops in signal strength. Ericsson's new update, on the other hand, makes its existing hardware perfect for getting edge computing and highly reliable 5G networks off the ground in suburban and rural locations.

"We are taking the next step in the evolution of 5G by making generally available the software to support standalone 5G NR networks. These standalone capabilities will enable even more use cases and applications," said Ericsson's head of product area networks Per Narvinger.

Cellular providers T-Mobile and Telstra have both deployed Ericsson's standalone 5G NR on their networks, and Ericsson ecosystem partners Qualcomm and MediaTek have already been through interoperability projects that will allow them to start releasing standalone 5G products later in 2020.

THE 15 BEST CITIES FOR 5G WORLDWIDE

A report from Business Fibre also outlined the most and least internet-friendly cities around the world.

BY MACY BAYERN

IMAGE: ISTOCKPHOTO

With professionals around the world working remotely during the coronavirus pandemic, a strong internet connection is more important than ever. A report from Business Fibre identified the best cities in the world for 5G, the most internet-friendly cities, and the least internet-friendly cities.

5G is shifting from hype to reality: The market for 5G infrastructure is expected to hit $4.2 billion this year, and two-thirds of companies said they are deploying 5G in 2020, Gartner found. 5G's promise of low latency and high bandwidth means greater connectivity for high-level automation and Internet of Things (IoT) devices—from anywhere.

To see what areas are the furthest along with 5G, Business Fibre determined the locations with the most 5G hotspots around the world.

15 BEST CITIES FOR 5G

The following cities have the most 5G networks across the globe.

1. Seoul, South Korea – 83 networks available
2. Los Angeles, USA – 40 networks available
3. London, UK – 35 networks available
4. Miami, USA – 14 networks available
5. Las Vegas, USA – 13 networks available
6. Hong Kong, Hong Kong – 8 networks available

7. Dubai, UAE – 8 networks available
8. New York City, USA – 5 networks available
9. Shenzhen, China – 3 networks available
10. Shanghai, China – 3 networks available
11. Mecca, Saudi Arabia– 3 networks available
12. Guangzhou, China – 3 networks available
13. Rome, Italy – 2 networks available
14. Barcelona, Spain – 1 network available
15. Bangkok, Thailand – 1 network available

TOP 10 MOST INTERNET-FRIENDLY CITIES

The report also identified the most internet-friendly cities based on the number of free Wi-Fi spots, the average cost of data, the number of restaurants with free Wi-Fi, as well as the average upload and download speeds.

1. London, UK
2. Tokyo, Japan
3. Paris, France
4. Singapore
5. New York City, USA
6. Amsterdam, Holland
7. Barcelona, Spain
8. Bangkok, Thailand
9. Seoul, South Korea
10. Osaka, Japan

London took the top spot with the second-highest number of free Wi-Fi hotspots at 688,126 and the highest number of restaurants with free Wi-Fi at 3,981. Paris, which came in at No. 2, only had 2,750 restaurants with free Wi-Fi.

Five of the top 10 were based in Asia, with Japan holding two cities in the list. Europe had four out of the 10 destinations, including Amsterdam, which had the fastest upload speed, according to the data.

10 LEAST INTERNET-FRIENDLY DESTINATIONS

The report listed the least internet-friendly locations as well, with the same parameters as the locations that were the most internet-friendly.

1. Dubai, UAE
2. Agra, India
3. Shanghai, China
4. Antalya, Turkey
5. Shenzhen, China
6. Delhi, India
7. Istanbul, Turkey
8. Mumbai, India
9. Kuala Lumpur, Malaysia
10. Taipei, Taiwan

While Shenzhen, China had some of the most 5G connections, the location lacked regular internet-friendliness, indicating that areas that are far along in 5G might not necessarily have the most accessibility.

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