www.pipelinepub.com
Volume 16, Issue 12

How COVID-19 Has Changed the Broadband Industry

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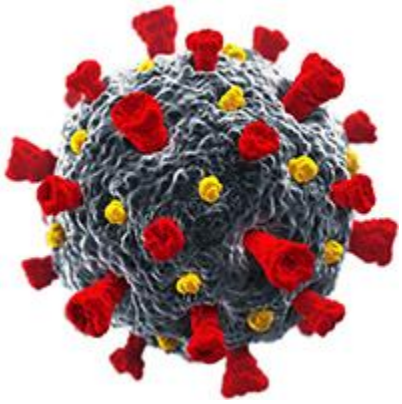

Broadband connectivity has played a vital role during the COVID-19 pandemic, way beyond keeping bored households entertained through lockdowns. For many of us, broadband has helped keep us connected, employed, fed and educated, not to mention sane. For businesses and governments, it has ensured some level of economic activity and helped to inform and protect citizens.

Broadband service providers and network operators have seen enforced lockdowns during the pandemic create a seismic shift in online behavior. Independent network traffic sources like Ookla, operators like AT&T, and equipment vendors like Nokia have all reported spikes in broadband demand of anywhere between 30 and 60 percent. Online gaming, video streaming, VPN usage, and video collaboration platforms like Microsoft Teams, Zoom and Webex have all contributed. See Figure 1.

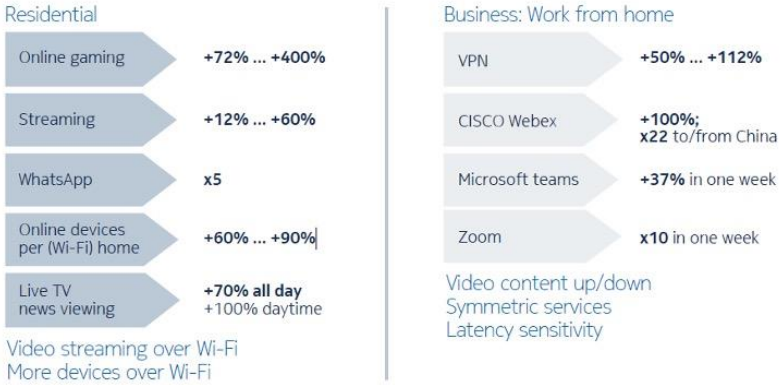

Figure 1: Increase in bandwidth demand due to COVID-19 lockdowns, 1Q2020 (showing the range of increases published by various sources)
[click to enlarge]

Other significant consequences for broadband providers are that "off peak" all but disappeared (daytime traffic jumped 30-40 percent while evening and weekend traffic rose 10-15 percent); significantly more devices and households were connected simultaneously (playing havoc with the capacity planning assumption that only a few households are active at any given moment); and upstream bandwidth for video conferencing has suddenly become as important as downstream.

These increases, of course, only paint a partial picture as they come only from networks able to support increased traffic. A 4G or an ADSL connection offering up, say, 10 Mb/s will never deliver a massive spike in usage, which highlights the issue of minimum service levels. The same network data from Ookla et al also shows that fixed networks, rather than mobile, have borne the brunt of the traffic increase. This is not surprising: mobile as deployed today is mostly designed for people on the move, not in lockdown. In countries that rely heavily on mobile broadband, Ookla shows a noticeable degradation in both speed and latency during lockdowns. However, in countries where fixed networks are robust, that degradation of the mobile experience has been more moderate because many users opt to use Wi-Fi and fixed broadband instead of cellular connections on their mobile devices.

Broadband connectivity as infrastructure

Whether underserved or completely unconnected, households with reduced access to information, essential services, and connectivity to others have been both socially and economically vulnerable during this crisis. Flip that around to a more positive and achievable statement: the better broadband connectivity a country has, the better a government has been able to protect its citizens and protect its economy.

Let's look at how this all matters in the long run. Once this is all over—once we have a vaccine or effective treatment for COVID-19—will anything really have changed for the broadband industry? The short answer is yes, and the short reason is because fixed broadband has proven itself to be a necessity for a prosperous, safe, healthy, and functional society. There is now a strong argument to consider broadband alongside water and electricity as fundamental infrastructure for every country.

No one is predicting that societies will return to exactly how they were before COVID-19. Governments and industries will need to evaluate the long-term implications, and the broadband industry is no different. For us, digital behaviors learned over the last few months are likely to remain to a significant degree: the convenience of online shopping and banking; video appointments with healthcare professionals; Zoom as a replacement for short-haul commuting and long-haul travel, to name just a few. Online retailers are booming, as are OTT service providers like Netflix. Organizations large and small are advocating for increased homeworking for employees in a bid to reduce real-estate costs, give employees a better work-life balance, and reap the benefits of a dispersed, agile, productive remote workforce. All these indicators point to a significant increase in demand compared to the pre-COVID world.

Just as importantly—or more importantly, depending on your persuasion—governments have seen the effects of good and bad broadband on their efforts to support frontline workers and services, to keep citizens safe and informed, and to monitor citizens' activity. Track and trace apps, online public health and vital government services, online and social media as an information channel; governments' needs of both fixed and mobile broadband in support of this crisis have been many and varied. And, of course, governments have seen the Internet as a veritable savior of jobs and

economies, where employees and businesses have been able to move or maintain their activities online.

Increased investment

These shifts in priority, from both users and overseers, are already translating into increased investment plans. Industry analyst firm Omdia recently made an upward revision to its market forecasts for wireline broadband access equipment, based on network operators' increased demand post-COVID. An expected five percent uplift compared to the previous forecast will see the demand for PON grow to over $8 billion in 2021, Omdia suggests, and keep climbing through to 2025.

Another statistic of significant interest to both operators and governments comes from analyst firm Broadbandtrends. It estimates that 900 million households around the world still have no fixed broadband connection, and another 500 million have services of less than 50 Mb/s. That is a lot of economically and socially vulnerable households.

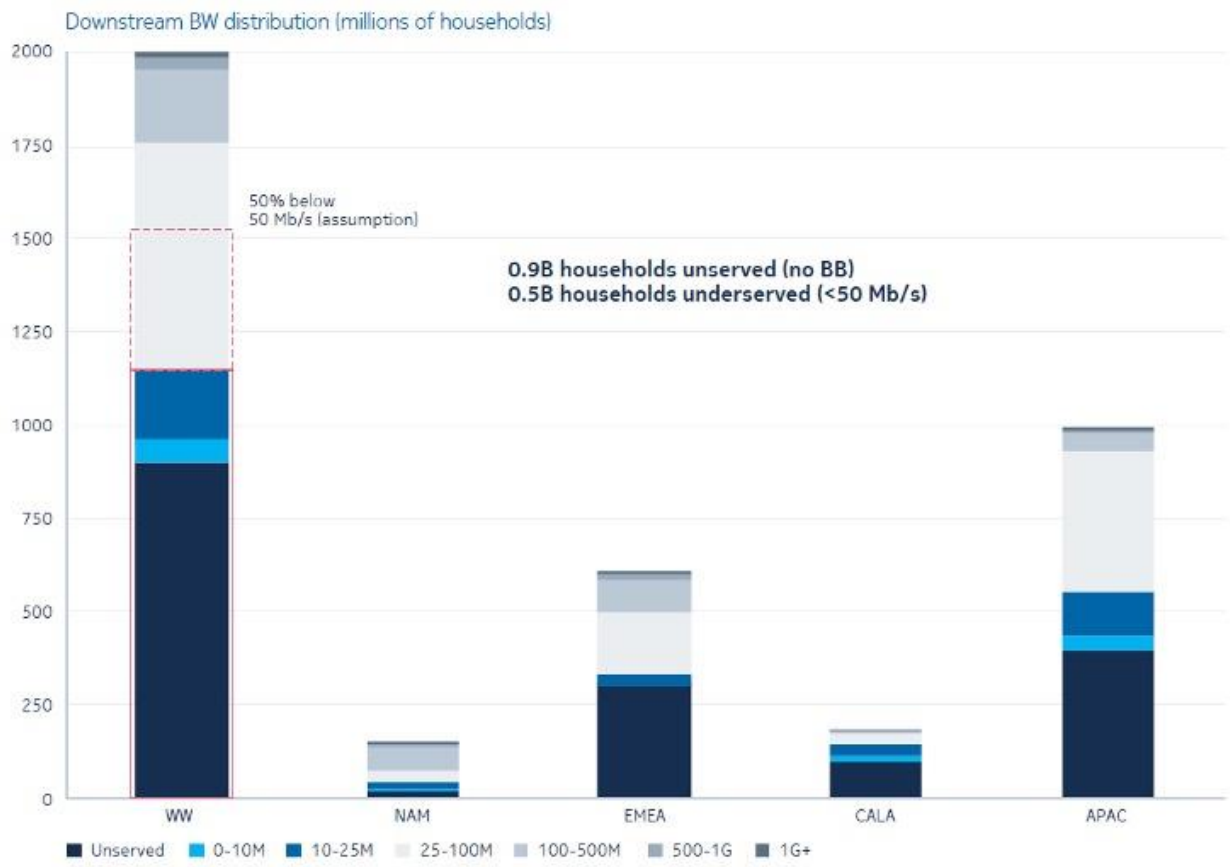

Figure 2: Unserved and underserved homes
[click to enlarge]

This 50 Mb/s figure is important because it's about the benchmark of the *new normal*, according to Nokia's bandwidth forecast model, which has been updated to reflect lockdown needs. Looking at typical usage of a lockdown household—for example, a homeworker on a video conference call, a student on an e-learning platform and another family member on Netflix—a comfortable

minimum downstream bandwidth easily reaches the 50 Mb/s mark, more for a household with many simultaneously connected devices, demand for 4K TV, or virtual reality, etc.

As already mentioned, upstream is important, too: 15 Mb/s is about the minimum for the kinds of activities where "consumers" of video have now become "producers." This is why Omdia's revised market forecasts specifically call out increased PON investment. Fiber-to-the-home is the priority—not only to meet the new levels of bandwidth demand but also as an enabler of 5G rollouts. As 5G standards have matured, PON has become the obvious cost-effective solution for providing backhaul and fronthaul for 5G traffic. The difference between a PON fiber access network with residential Wi-Fi on the end of every connection is really no different from a PON fiber access network with a 5G small cell on the end of every connection. That's where we're rapidly headed.

For governments, there's an urgency to rethink the broadband plans they drew up before COVID. The sheer scale of vulnerable households—both unserved and underserved—affects previous timelines for connectivity and minimum service levels. At the same time, there is the opportunity to bring 5G and FTTH plans together to provide the ubiquitous coverage that protects citizens and economies.

From the operator perspective

Operators will, of course, need to respond to government requirements, but they also have pressing concerns and opportunities of their own. The surge in demand brought about by COVID lockdowns has blown apart two long-held rules of thumb in broadband. The first is that subscribers don't all need bandwidth at the same time. Until now, we've been able to rely on statistical multiplexing to, for example, provide a gigabit service to 16 homes, using PON fiber technology that delivers a maximum 2.5 Gb/s—simply because those 16 homes are unlikely to need a full gigabit at the same time. This assumption is no longer valid, leaving operators at risk of being unable to meet their agreed service levels. The second rule of thumb is around year-on-year traffic growth. Operators typically plan for around 10 percent traffic growth per year. They've seen four or five years of growth almost overnight. This implies that, even in well-connected and well-served areas (e.g. gigabit fiber areas), network upgrades must be accelerated. This will result in a much faster adoption of higher speeds and more symmetrical next-generation PON (10G or higher) technology.

We often talk about something being a “lifeline” in times of trouble. Never has it been more apt than for broadband during the COVID-19 pandemic. Broadband has literally been sustaining lives through lockdown, providing some level of social, educational and economic continuity to billions of people. If nothing else, COVID’s lasting legacy for the broadband industry will be the realization that broadband should no longer be seen as a luxury but as a fundamental necessity for citizens of the 21st century.