

The Network of the Future Is Already Here

The next generation of FTTH networks is already being deployed. NG-PON makes possible amazing speed, symmetrical service and the convergence of residential, business and mobile networks.

By Ana Pesovic / *Nokia*

Fiber optic networks are being deployed worldwide at an ever-increasing rate, offering huge advantages over the copper cables used in telecommunications networks for the past century. The greatest advantage of fiber is its almost unlimited bandwidth potential, which presents operators with service delivery possibilities that would have been unimaginable at the turn of the century.

The key to unlocking this potential lies in delivering a solution that incorporates the best elements of the many standards defined for fiber networks. This universal next-generation passive optical network combines the various technologies into a single platform through common hardware, providing the long-term value that operators crave. With such a solution, operators avoid locking themselves into options that may turn out not to be best for them in a year or two but can still deliver high-end services and operations at the best possible price point.

Next-generation PON is all about providing operators the ability to offer high-speed, symmetrical services that make the most of fiber's potential. In recent years, there has been an exponential increase in the demand for ultra-fast broadband speeds in both the business and residential markets. Gigabit speeds that were once a luxury are now becoming an in-demand commodity, and operators face a market that is constantly and quickly evolving.

NEW HABITS DIE HARD

Until recently, residential internet use was almost solely about downloading content in one form or another. People used their bandwidth to catch up on news stories, visit message boards and watch the occasional video clip. Only rarely did they upload data and put content back onto the network. During these times, operators focused almost completely on giving their customers the best possible download speeds, creating asymmetrical networks.

By 2017, several key evolutions in customer behavior changed the way people use the internet. Users store thousands of images in the cloud, make video calls to the other side of the world and upload videos to YouTube or other forms of social media. Though data usage patterns are naturally still skewed toward downloading, there has been a perceivable increase in uploads.

If you were to view data usage over a week as a map, downstream traffic would still be higher than upstream, but upstream traffic would have occasional high peaks where, for example, a batch of photos were uploaded to social media or a video call took place. Network operators have long provisioned for bursty download demands, but they must now account for these changes in customer behavior and provide a network that can cope with the peaks in uploads.

This upstream half of their service is becoming increasingly important to residential users. There is a discernible pleasure in seeing thousands of photos uploaded in a matter of seconds, and evidence suggests that the more upstream speed that is available, the more it is used. In Asia – where many operators offer high upstream bitrates – significantly more upstream bandwidth is used. The ratio of upstream to downstream usage in Asia is 1:3, compared with 1:20 in Europe.

As residential need for upstream service increases and becomes more comparable to what has been offered to business customers, operators will find themselves in the advantageous position of being able to converge these two types of network into a single NG-PON, leading to cost savings and faster return on investment.

ADAPTING TO CHANGING TIMES

Bear in mind that NG-PON is not just a pipe dream or something being tested and trialed. Nokia currently has eight real-world deployments already showing its value. The city of Chattanooga, Tennessee, is an example not only of the deployment of NG-PON but also of the positive impact it can have on end users. Delivering 10 Gbps service in an era in which U.S. broadband connections are hundreds of times slower, on average, has positioned the city as a leading light for innovation. Local companies are delivering new services for their community in tourism, business and security, carrying on the resurgence the city experienced in 2010 when it became the first to build a communitywide fiber optic network capable of delivering gigabit speeds.

The speed and nature of network evolution has to take a wide range of factors into account, and it is important to recognize the role of mobile networks in the overall equation. As 5G moves closer to reality, the question often asked is whether a new generation of fixed fiber networks is really needed if mobile connections can provide fast speeds everywhere.

The truth, however, is the polar

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opposite. With the capacity demands that 5G will bring, there will be more need for fixed fiber networks than ever before. 5G will rely on 10 times more small cells than today to ensure ubiquitous connectivity, and the best way to backhaul that traffic is to use the fiber networks being deployed at the moment. In short, fiber's cost-effective low latency and high capacity capabilities mean it will play an essential role in the 5G era.

A universal, holistic approach is the most effective way to ensure that the networks of the future work for everyone. For operators, fiber needs to

provide long-term value and deliver the kind of services their customers want at prices that work for them and the customers. In turn, those customers rely on network operators to provide the always-on connectivity that is now an essential part of everyday life. As fixed and wireless offerings converge, the role of fiber is increasingly important, and the evolution of NG-PON will be crucial to its success. ❖

Ana Pesovic is the marketing manager for fiber solutions at Nokia. Contact her at Ana.pesovic@nokia.com.

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