

The Power and Promise of Fiber Networks

As high-bandwidth connectivity influences our lives in ever more important ways, making proper investments in communications infrastructure to stay ahead of demand also becomes ever more important.

By Kara Mullaley / *Corning Optical Communications*

This spring, as I traveled around the world, I stayed completely immersed in “Game of Thrones.” It didn’t matter if I was in Amsterdam, South Carolina, Florida, Brazil or North Carolina – in my mind, I was in the fictional land of Westeros, wondering who would be the rightful heir to the Iron Throne. I followed the action the same way many people outside our industry do, appreciating the lightning-fast connection available at home, on planes and in airports and hotels without giving much thought to the underlying networks that make them possible.

The ability to stream a favorite TV show anywhere in the world, at any time, is just one reason to marvel at the transformational impact of high-speed connectivity in recent years. The connectivity the communications industry provides (or doesn’t) makes a real difference in people’s lives. There are serious implications when it comes to jobs, health care and education across the country based on whether services can be accessed over adequate – read, high-speed – broadband and wireless connectivity.

Those in the industry have the responsibility to continue improving so that individuals, businesses and organizations can get the high-speed connectivity they need to succeed.

HOW FAR WE’VE COME

Taking a break from thinking about networks was a change for me. All too often, my work

at Corning extends into my personal life. I’m keenly aware of the network around me as I move through the world. I see the fiber optic closures on overhead lines; I notice the subtle network interface device (NID) on the side of my house. Maybe readers can relate. The people who sell, install, service and support network operations see what the average subscriber misses.

They recognize that connectivity already has transformed the world.

When I attend football games at my alma mater, Virginia Tech, I marvel at the fan experience. It has changed since my days as a student into today’s snappable, tweetable moments – a lens people use to measure time and recall memories. I monitor my dog’s antics and control all manner of devices in my home, and now even in my car, remotely from my phone.

It’s staggering to think about how dramatically the service and application experience has changed in the last 10 years alone. Entire new industries have launched thanks to connected possibilities, and the “internet of everything” is in its infancy.

THE FUTURE OF 5G

Let’s consider the installed base around us: the macro tower designed to look like a tree, the cellular antennas on the town’s water tower, new hardware atop street lights, or maybe the spare

fiber ports on the pole near your home. What you've witnessed is the expansion of fiber networks. But have you also noticed the next-level transformation?

Individual, purpose-built networks reach a point at which they are no longer economical or efficient. Operators reach a point at which installing and running networks the same way they've always done it stops making sense, consumer expectations shift, and performance expectations and deployment speeds start to change.

Where big cell towers continue to maintain cellular coverage today, small cells will increasingly be necessary to ensure the future of 5G – and the applications that will arrive with it. Even the way information is stored and transferred within switching centers and data centers will change with the emergence of edge computing.

To people outside the industry, network transformation will be practically invisible – except when it comes to an emerging array of connected “things.” More and more common aspects of everyday life will grow to have a connected feature, carrying transmission abilities that collectively can reduce a broad range of operating costs.

The transformation undoubtedly will be a fundamental shift; it will put technology to work for individual and business consumers alike. Artificial intelligence, self-driving cars, virtual reality chat and gaming, at-home medical support and monitoring, and even remote surgery are just a few capabilities that will enable strategic network evolution.

Personally, I get to help operators prepare their networks for emerging experiences, because the exciting, near-future technologies – even the cloud- and wireless-based ones – are built upon the backbone of optical fiber.

FIBER MAKES IT POSSIBLE

Optical fiber, invented by Corning in 1970, is thinner than a human hair yet able to carry information that connects the world. Because of its compatibility with other technologies and nearly unlimited bandwidth capacity, optical

fiber has the ability to grow and adapt to future communications needs.

Over time, fiber is continuously phasing out legacy copper infrastructure – spreading across continents and throughout cities. Perhaps much of your focus today is on delivering fiber ever closer to where people connect, whether it's in the horizontal portions of mixed commercial/residential buildings or in rural areas.

To make sure there is enough fiber in place to support urban areas, remote regions, and everywhere in between, network operators are investing in communications infrastructure. Maybe you are moving fiber deeper into your community – into the cabinet or pedestal on a street corner, or onto the lamppost at the end of the sidewalk, or possibly even into homes and businesses. These investments are crucial to stay ahead of demand for high-bandwidth services.

With network transformation will quickly come the transformation of the services and applications that impact subscribers' daily lives, wherever they are. Our industry's ability to prepare communications infrastructure will help determine whether people, businesses and communities thrive. Tomorrow's infrastructure may not be any more visible to connected consumers, but they will notice your network's capabilities.

In this series, I'll explore in depth some issues introduced in this article. For example, the next article will dive into the tipping points for phasing out legacy copper infrastructure and strategies for migrating to a passive optical network. Later in the series, we'll discuss the converging of networks and how the infrastructure you place today could provide many more services (and revenue streams) than single, purpose-built networks. ❖

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