

Building a SAFEr Access Network

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KEY TAKEAWAYS

- Network performance demands have changed with the evolution of digital technology.
- Changing market trends create both business opportunities and challenges for network operators.
- The SAFEr access network addresses industry challenges.

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OVERVIEW

The increase in the number of connected devices serving a wider range of applications, coupled with the advancements in network technology over the past decade, has driven demand for improved network performance, scalability, and reach. Building or upgrading a high-performing access network is expensive and time-consuming, so the network needs to last for a long time.

Designing the network to be SAFE—**S**ustainable, **A**ccessible, **F**lexible and **E**xpandable—allows network operators to maximize their return on investment now and well into the future. AFL, a manufacturer, designer, engineer, installer, and maintainer of fiber optic networks, provides products and solutions that network operators can put into practice to achieve SAFE networks.

CONTEXT

Josh Simer explained challenges and opportunities in network operations today and discussed ways to install and maintain a SAFE fiber network.

KEY TAKEAWAYS

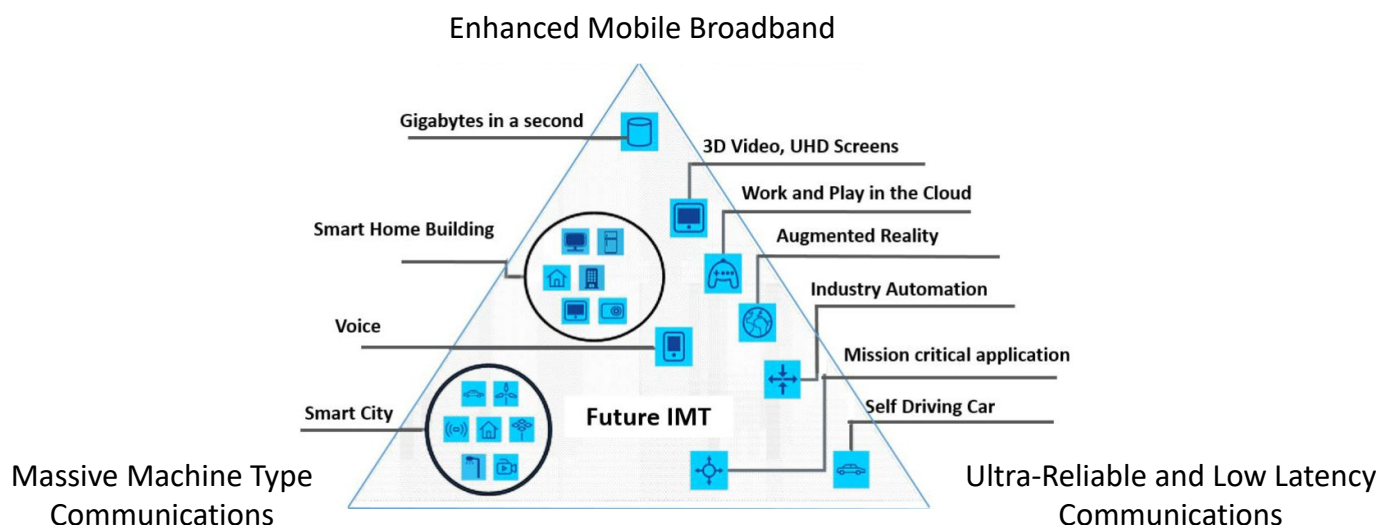
Network performance demands have changed with the evolution of digital technology.

Over the past decade, the use cases for technology have grown exponentially, placing increasing demands on network and communication capabilities. The rapid pace of application and development for the larger space of digital technology requires a correspondingly high-performing network.

Consider, for example, use cases that 5G technology attempts to achieve. These align closely with the goals of broadband and connectivity service providers, including:

- **Enhanced mobile broadband** for faster download speeds.
- **Massive machine type communications**, for supporting more connected devices, as well as a greater variety of these devices.
- **Ultra-reliable and low-latency communication** that is important for many applications.

Figure 1: Examples of 5G applications



The Internet of Things (IoT) has moved connectivity beyond modems and optical network terminals (ONTs) to 3-D printers, traffic lights, farm equipment, and more. The number and variety of connected devices is projected to grow indefinitely. And although many IoT devices are brought online through a wireless connection, the final connection to the network is wired, leading to growth in a variety of fiber network endpoints, including homes, devices in factories, small and macro cells, and edge data centers.

“It’s not just aggregate bandwidth. It’s having the fibers to do that—[to] physically make that connection—and having the flexibility to accommodate connections where this new customer exists. And it’s not just making the connections; it’s making the type of connection they need.”

Josh Simer, AFL

Changing market trends create both business opportunities and challenges for network operators.

This growth in devices and endpoints creates opportunities for network operators as well as challenges to realizing those opportunities, as detailed below:

Scenario	Description	Business Opportunity	Challenges
Wireless Densification	One or more mobile providers add multiple small cell sites to cover an area that previously had just one “macro” site	Mobile provider willing to pay for fiber capacity to save the cost of deploying their own network	1. Ensure network capacity can expand to provide this service 2. Have the flexibility to accommodate connections where the mobile operator wants them 3. Technicians must be able to access network to make changes
Business Automation	Car repair shop closes, 3D printing shop moves into same location	Opportunity for greatly increased revenue for providing more bandwidth and services	1. Ensure network capacity can expand to provide this service 2. Have the flexibility to accommodate connections where this new customer exists 3. Technicians must be able to access network to make changes
Subdivision	Property subdivided to build multiple homes/businesses	Where there was once one potential customer, now there are many	1. Ensure network capacity can expand to provide this service 2. Have the flexibility to accommodate connections where this new customer exists 3. Technicians must be able to access network to make changes

In addition to the expansion, flexibility, and access challenges presented by new opportunities in the network operations space, sustainability is becoming an increasingly important and more encompassing challenge for network operators to consider because:

- **Service providers are pursuing it.** Service providers such as Verizon and ATT have goals to be carbon-neutral by 2035. In terms of the life of a physical access network, which can contain decades-old components, 2035 is fast approaching.
- **Customers expect it.** Surveys of business leaders show that sustainability is important, although the enterprises represented have set a range of sustainability-related goals.
- **Governments will require it.** California has instituted enterprise reporting requirements around sustainability, and Minnesota has imposed sustainability requirements on utilities, among others.

“With the right planning and innovations for manufacturers, you can ensure that the network you build today will . . . give you the sustainability you need, as well as the ability to realize your business opportunities—today [and] tomorrow.”

Josh Simer, AFL

The SAFEr access network addresses industry challenges.

AFL developed the SAFEr (Sustainable, Accessible, Flexible, Expandable) network concept to address the challenges and considerations faced by today's network operators. Although fiber networks are costly to install, building the network using SAFE products and solutions significantly extends the lifetime of a fiber network to a point of dramatically higher value than other network choices.

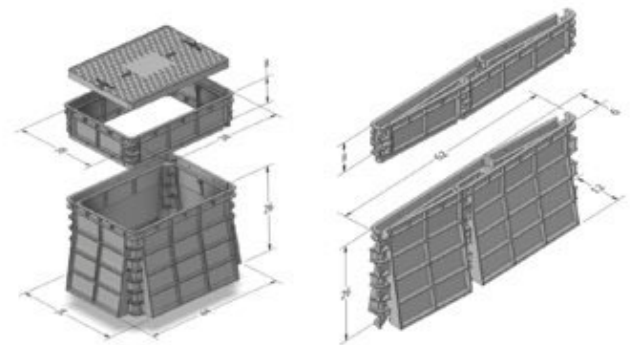
Sustainable

A converged access network must be designed so its installation and operation minimize adverse environmental impacts, and with the capability to support its users' sustainability goals. Fiber uses less power than copper, provides greater bandwidth, and improves latency. This allows fiber networks to support multiple connections more effectively, a core contributor to sustainability as devices continue to proliferate.

Within a fiber network installation, manufacturers can also improve sustainability by:

- Making items collapsible (such as the vault shown in Figure 2) so more of them fit on a truck. Vehicles use a lot of energy. Reducing the number of trips by fitting more equipment in a single trip contributes to energy savings.

Figure 2: AFL's collapsible vaults help network operators improve sustainability



- Choosing compact and lighter cables to make a difference in energy use in every phase of the shipping and logistics process, from manufacturer to warehouse, then on to the job site. More cable per reel and kilo means fewer reels to ship and more cable per trip.
- Using products and solutions to make the network accessible, flexible, and expandable, requiring less frequent maintenance and fewer dispatches of workers to job sites over time.

- Recycling reusable items, such as reels, where possible.

“Sustainability is a critical consideration and will become even more critical over time. The number one way to make a new access network more sustainable is to make sure it lasts as long as possible.”

Josh Simer, AFL

Accessible

A converged access network must allow techs and contractors the ability to readily implement these network changes quickly and in a cost-effective manner. Physical changes to the network not only require time and labor, but also introduce risk to existing connections. Manufacturers can improve accessibility by:

- Installing splice closures that are easier to reenter and to reseal correctly. This reduces the risk of incorrectly resealing, which can cause problems with the rest of the network. AFL's splice closures are easy to reenter and reseal, and with enough slack the closures fit in each size handhold, strand, and pole space.
- Using plug-and-play solutions that allow new connections without having to open the cable or closure.
- Employing Bluetooth-enabled splicer test and inspection equipment to make information more accessible, reducing the amount of field time required and making it easier to assess network condition.

Figure 3: AFL products help network operators improve accessibility



Flexible

A converged access network must have the capability to be reconfigured to accommodate moves/adds/changes, new technologies (5G, 6G, and beyond), new business cases and revenue opportunities, and other events that can't yet be planned for.

Figure 4: AFL products help network operators improve flexibility



Manufacturers can improve flexibility by:

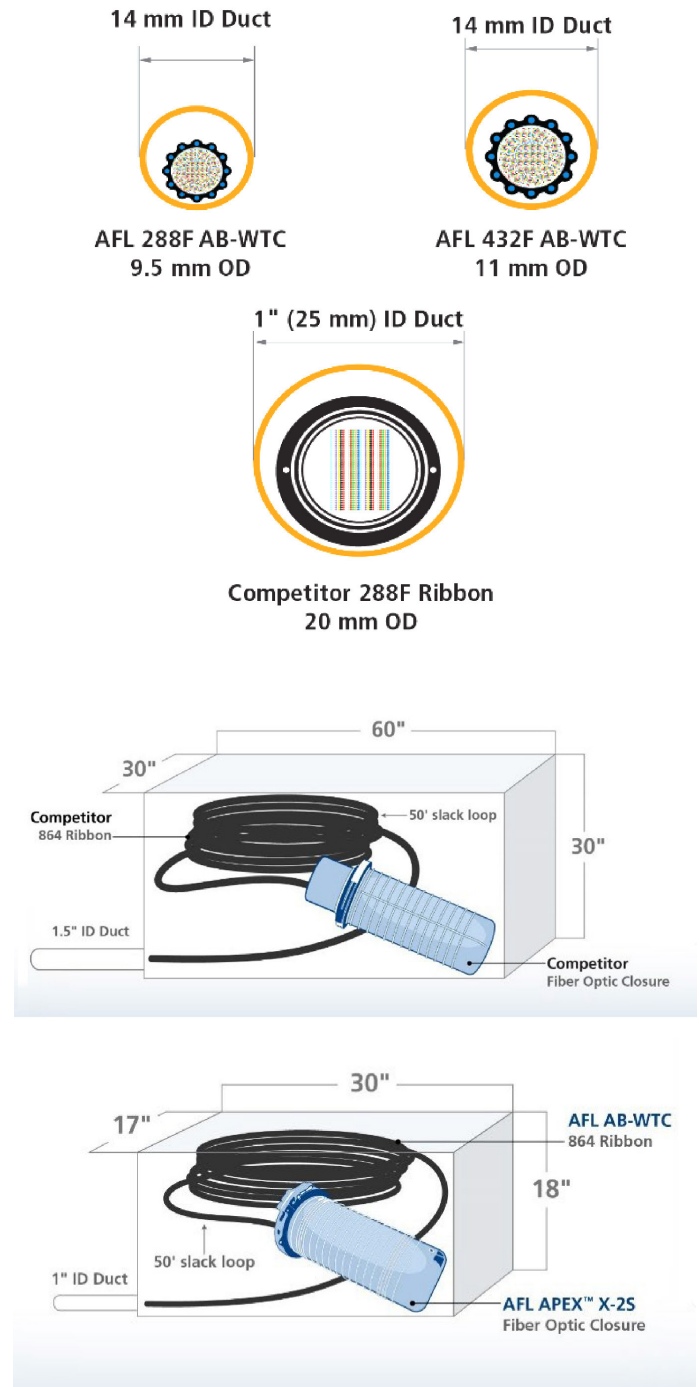
- Using modular products, which provides a point of flexibility to come in and make changes. AFL's modular fiber panels make it easy to change connectivity types (e.g., SC, LC, MPO) to accommodate traffic growth, and modular splice closures use the same splice tray for ribbon or single fusion, allowing accommodation of new demands with fewer SKUs. AFL's splice closures are compact, leaving room for more current and future connections in the same space.
- Leveraging plug-and-play solutions to readily add new connections without having to deploy a splicer.

Expandable

A converged access network must have the capacity to accommodate future growth in traffic, new business and use cases, and more. Manufacturers can improve expandability by:

- Using the more compact fiber cables coming on the market. For a given size duct, the compact cables allow more fiber at the same weight to be deployed, for similar overall construction costs. When running a new underground or aerial path, where a cable will be run, regardless of type, the increase in installation cost for an AFL 432F over a 288F ribbon cable is often as low as 2% for double the amount of fiber and twice the capacity.
- Putting more splice capacity into the same or smaller space. AFL Apex X-25 is a more compact 864 ribbon closure and loop configuration, leaving more space for future additions and changes.

Figure 5: AFL products help network operators improve expandability



ADDITIONAL INFORMATION

To learn more about AFL, visit www.aflglobal.com

BIOGRAPHY



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Josh Simer is AFL's market strategy & innovation manager for service providers and multiple system operators (MSOs). He has been in the optical fiber and ICT industries for 15 years, prior to which he was a US Army Infantry Officer. Simer has served and continues to serve in a variety of roles, including product, solution, and program management and has worked with a full range of customers, including large to small service providers, MSOs, utilities, co-ops, enterprises, and data center operators. Simer can be reached at josh.simer@aflglobal.com.