BROADBAND NETWORK ARCHITECTURES FOR COMMUNITIES

Unlock the Potential of Connectivity

Empower Your Community with Broadband

Affordable, reliable and high-speed broadband can enhance economic development and improve your community's quality of life. To begin, you must first select the architecture that best suits your needs. AFL is proud to offer fiber optic cable and components that meet domestic preference requirements for federally funded projects. Our products leverage an international manufacturing network with a robust supply chain, allowing us to meet our customers' needs.

Our Commitment to Connecting America!

Connecting people is at the core of our mission. At AFL, we design and manufacture real solutions and reliable services that make connections possible for our customers. Prioritizing the advancement of broadband deployment in underserved communities across America and harnessing the potential of government funding programs are paramount objectives for our organization.

AFL is committed to playing a pivotal role in the expansion of broadband infrastructure across the nation. Through substantial investments, a robust BABA compliance program and strategic tracking of funding opportunities, we are well-positioned to support you in this transformative period for broadband deployment.

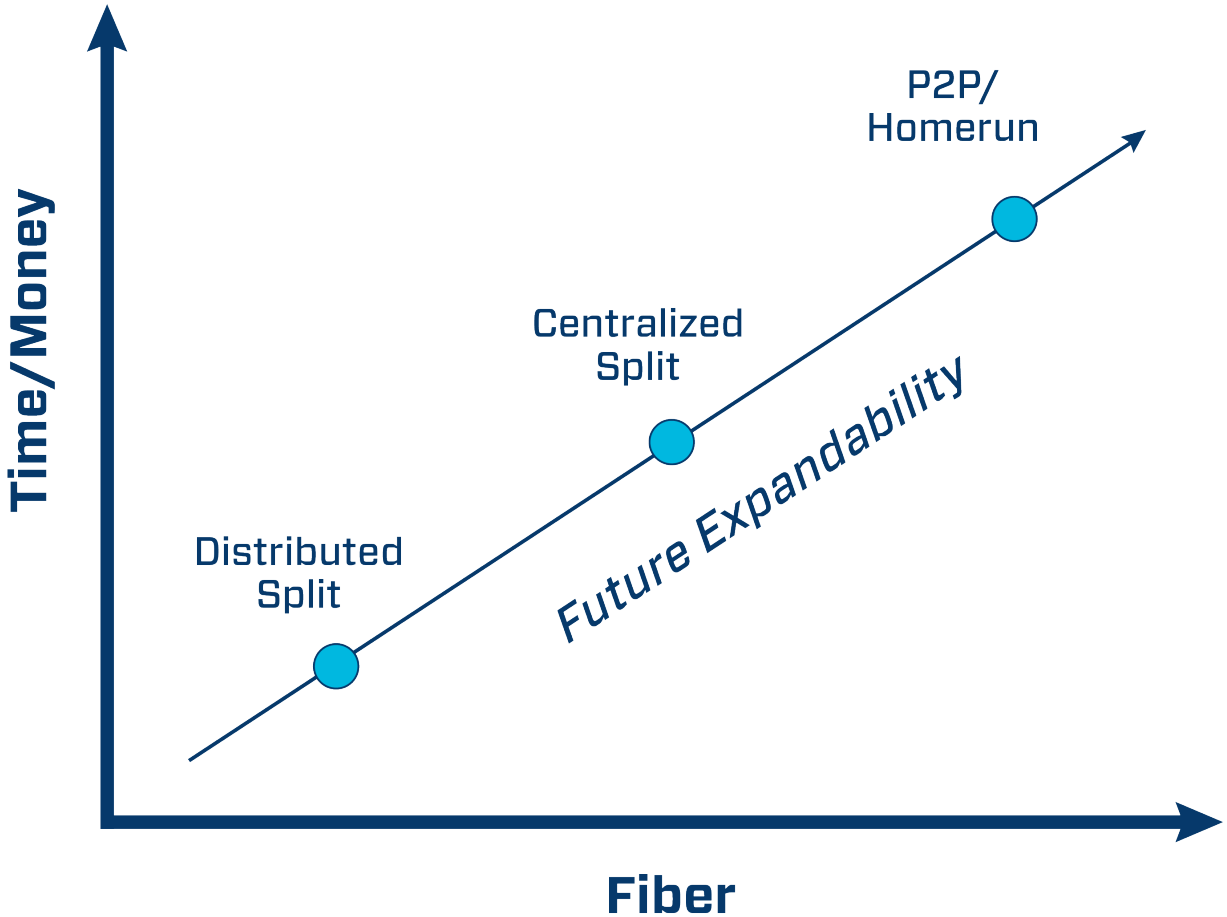
Learn more at www.aflglobal.com/Connecting-America

Fiber to the Home Architectures

Networks vary significantly in their capabilities. When planning your next deployment, optical fiber stands out as the most economic option. AFL fiber optic solutions are designed to make your network SAFER™ – Sustainable, Accessible, Flexible, Expandable and Reliable. When exploring fiber networks, several factors should be evaluated; this includes material and labor expenses, deployment time and optimizing the fiber density across the three prevalent architecture types:

- Home Run
- Centralized Split
- Distributed Split

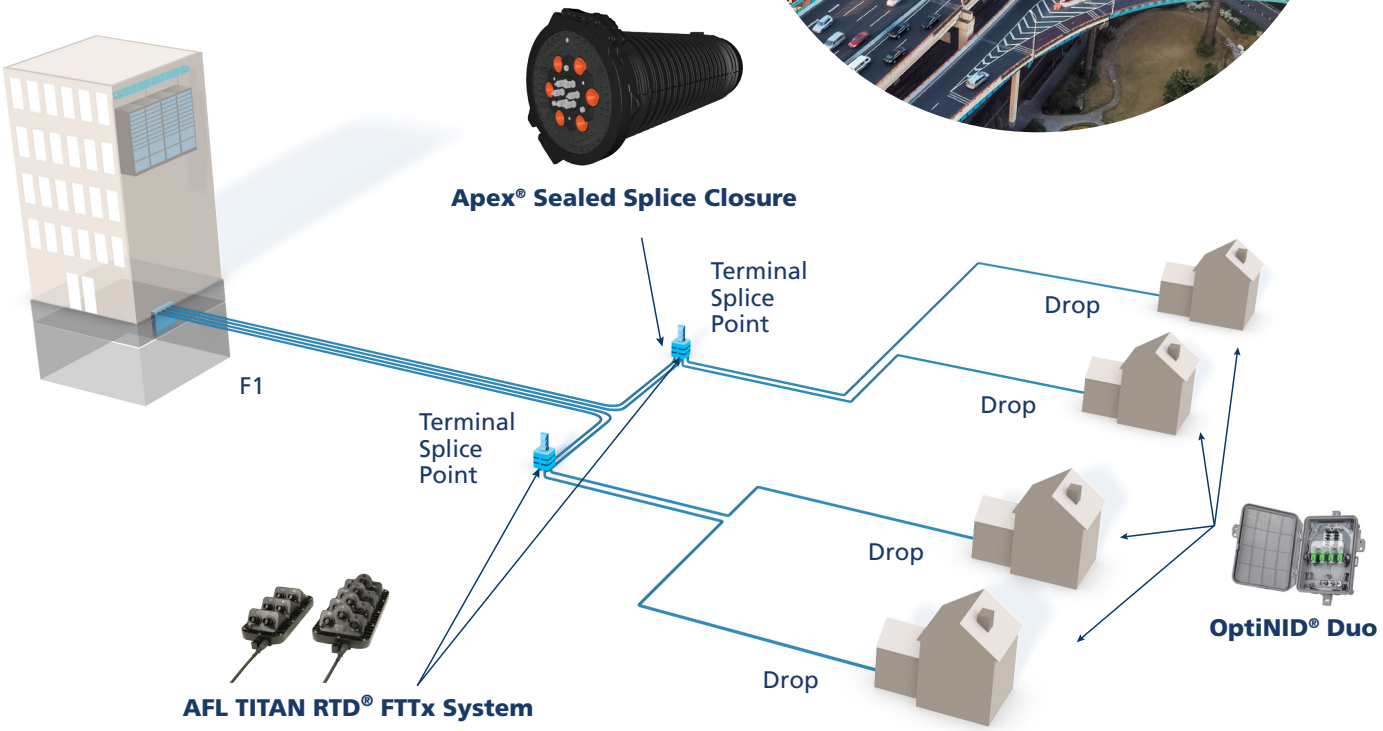
Comparison of Fiber Architectures



Home Run Architecture

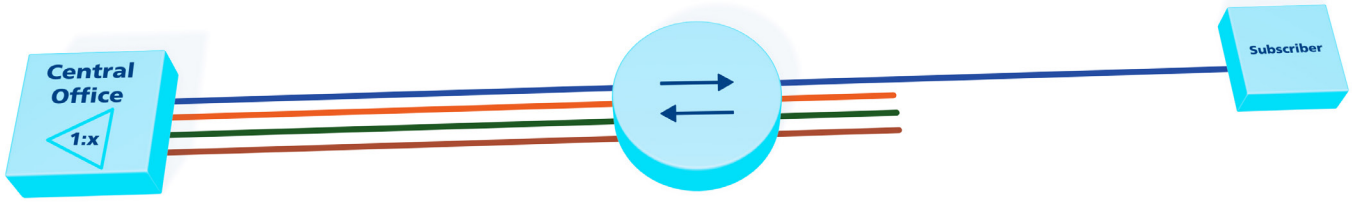
In this type of architecture, each subscriber is directly connected to the central office by an individual fiber. This means that it:

- Is typically used in high-density areas close to the central office.
- Features the most fiber-intensive setup, maintaining a 1:1 fiber ratio throughout the network.
- Offers the highest bandwidth potential.
- Provides the simplest path for future upgrades.



Key Considerations:

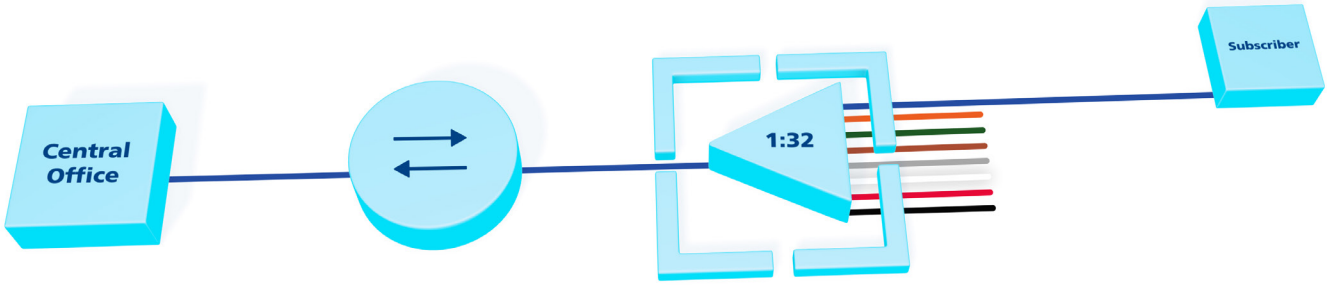
- Home Run networks are the costliest networks to construct since each potential end-user location requires an individual fiber connection to the signal source.
- Fiber cross-connect cabinets are sizable and necessitate dedicated pad or pole space.
- Deploying splitters in the central office provides high flexibility and efficient port management.
- No flexibility with splitter positioning as they're in the Central Office (CO).



Centralized Split Architecture

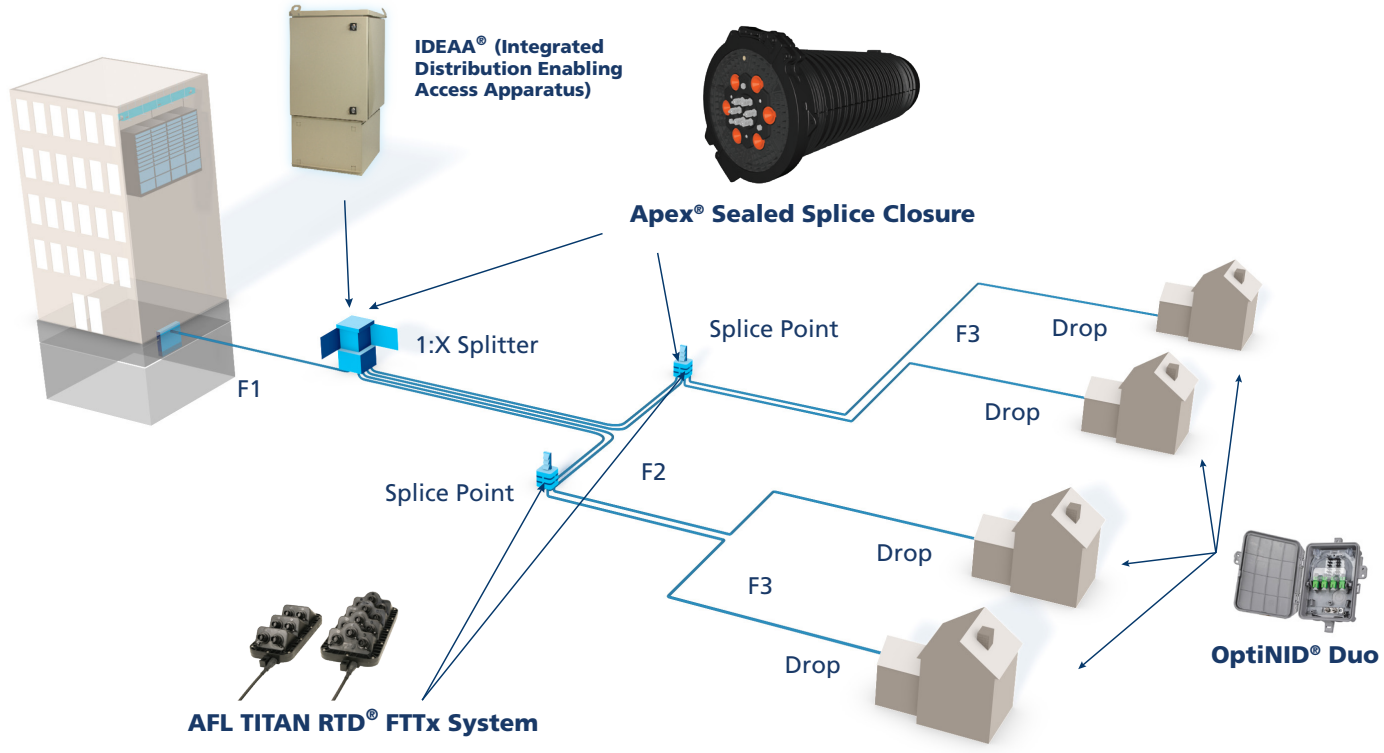
In this type of architecture, each subscriber is connected to an FDH via a dedicated fiber (1:32). This means it:

- Is frequently implemented in areas where a large central office serves clusters of homes.
- Lean fiber feeder cables extending from the central office to the cabinet, with high fiber density extending to subscribers (1:1).
- Allows for easy adjustment of split ratios and transport technologies.
- Uses centralized splitter placement to enhance Central Office (CO) OLT effiiciency.



Key Considerations:

- Fiber distribution hubs are substantial in size and need dedicated pad or pole space.
- High-fiber-count cables extending from the cabinet can be expensive over long distribution distances.
- Less costly than a home run design.
- Does not take advantage of different splitter ratios.

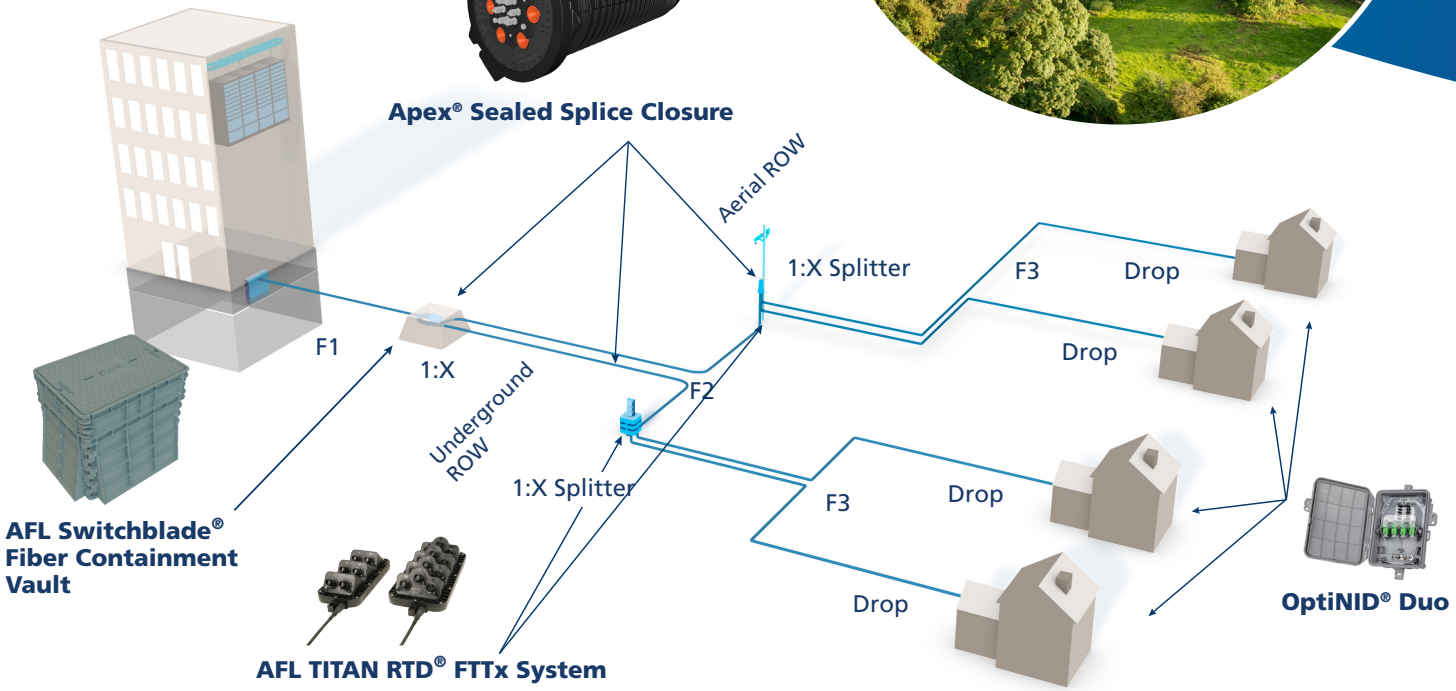


Distributed Split Architecture

In this architecture, a dedicated fiber drop cable links each subscriber to the nearest splitter terminal access point. This means it:

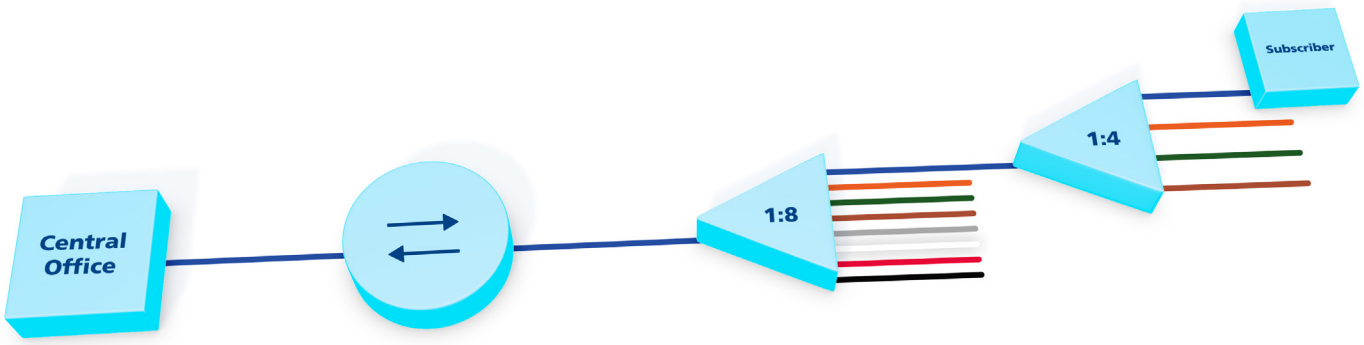
- Is a slimmer fiber architecture which uses distribution cables and a lower-fiber-count feeder.
- Has flexible split ratios with options for 2, 4 and 8 splitters.
- Uses smaller splitter access points at the initial split layer compared to Centralized Split.
- Has limited flexibility for future modifications.

Apex® Sealed Splice Closure



Key Considerations:

- Distributed Split architectures remove dedicated fibers to a central location, reducing future flexibility.
- Troubleshooting can be more challenging with several split locations instead of centralized fiber distribution hub.
- Including spare fibers in the feeder and distribution supports future expansion and rapid repairs.
- Fully pre-connectorized options incorporate spare ports.
- Most economical choice for rural areas.



Guide to Network Architectures Using the Architecture Cube

The architecture cube visually represents different network architectures based on three main parameters: Customer Density, Distance from Central Office (CO), and Take Rate. Here's a detailed guide to understanding and utilizing the different sections of the cube:

1. Customer Density

Customer density refers to the number of customers in a specific area.
It is a crucial factor in determining the most efficient network architecture:

- ***Low Density:*** Areas with fewer customers.
- ***Medium Density:*** Areas with a moderate number of customers.
- ***High Density:*** Urban or metropolitan areas with a high number of customers.

2. Distance from CO

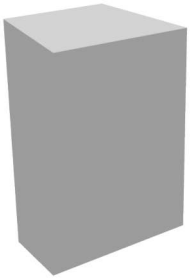
Distance from the Central Office (CO) impacts the network's performance and the type of infrastructure required:*

- ***Short Distance:*** Close to the CO, usually within a few miles.
- ***Medium Distance:*** A moderate distance from the CO.
- ***Long Distance:*** Far from the CO, requiring extensive infrastructure.

3. Take Rate

Take rate refers to the percentage of customers in an area who subscribe to the network service:

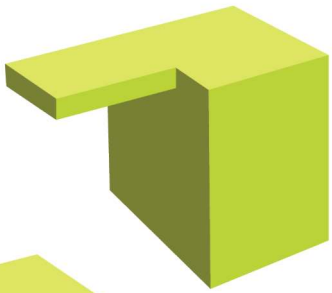
- ***Low Take Rate:*** A small percentage of potential customers subscribe.
- ***Medium Take Rate:*** A moderate percentage of potential customers subscribe.
- ***High Take Rate:*** A large percentage of potential customers subscribe.



DISTRIBUTED TAP

Description: Intermediate points (taps) between customers and the CO.

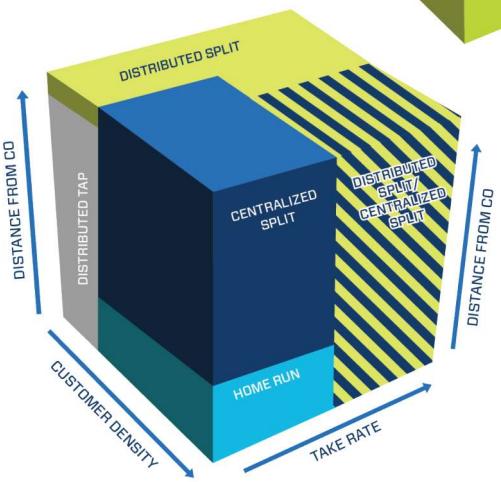
Usage: Usage: Ideal for low to medium- density areas with low take rates and low fiber counts.

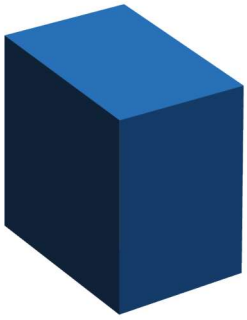


DISTRIBUTED SPLIT

Description: Multiple splitting points distributed throughout the network.

Usage: Usage: Suitable for all high take rate areas and low-density and varying take rate areas.

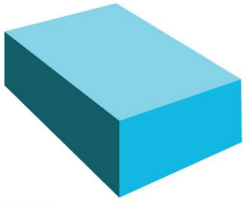




CENTRALIZED SPLIT

Description: Centralized points where signals are split and distributed to customers.

Usage: Best for high-density areas with a low take rate. Suitable for all low take rate areas in order to save on electronics cost.



HOME RUN

Description: Direct connection from CO to each customer.

Usage: Suitable for applications close to the CO or a situations requiring a dedicated fiber.

DISTRIBUTED SPLIT/ CENTRALIZED SPLIT

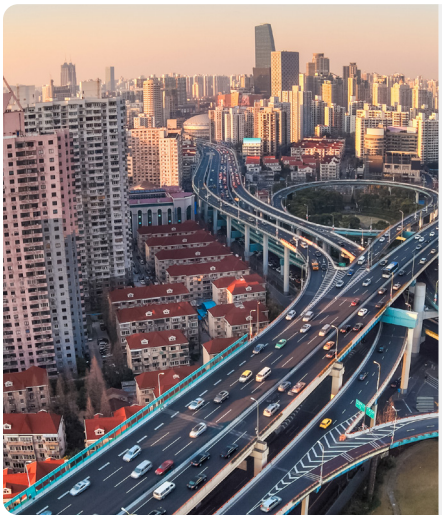
Description: Both Distributed Split or Centralized Split

Usage: This region is suitable for both Centralized Split or Distributed split architectures. Contact AFL for any questions relating to this region

*Short distance 3 miles - Medium distance 3-6 miles - Long Distance > 12 miles

Network Architecture Comparison

AFL has expertise in various network architecture types. Whether you are looking at a direct connection with a home run architecture, or are deciding between Centralized and Distributed Split, AFL has the products and experience to ensure your project is successful.



Home Run

- Has the highest fiber density
- Ideal for highly-populated regions

Upfront Capex:

Upfront Design Complexity:

Feeder Fiber:

Distribution Fiber:

Splitter Compexity:

OLT Port Efficency:

Strategic Growth Potential:

Upfront Testing Complexity:

Troubleshooting Network Outage:

Centralized Split

- Has a high fiber network architecture
- Suitable for tightly-packed residential areas

Upfront Capex:

Upfront Design Complexity:

Feeder Fiber:

Distribution Fiber:

Splitter Compexity:

OLT Port Efficency:

Strategic Growth Potential:

Upfront Testing Complexity:

Troubleshooting Network Outage:

Distributed Split

- Economical, fiber-efficient network
- Suitable for regions with varying population densities

Upfront Capex:

Upfront Design Complexity:

Feeder Fiber:

Distribution Fiber:

Splitter Compexity:

OLT Port Efficency:

Strategic Growth Potential:

Upfront Testing Complexity:

Troubleshooting Network Outage:

Contact Us Today!

AFL is dedicated to enhancing economic growth and quality of life through affordable, reliable, and high-speed broadband. Partner with us achieve your broadband deployment goals.

Visit our Connecting America webpage or reach out to us at ConnectingAmerica@aflglobal.com to follow along for more updates!

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