

The background image shows a modern, multi-story apartment building with balconies and large windows. There are green trees in the foreground and background. The sky is blue with some clouds. The text 'Effective Strategies for Providing Multi-Gig Broadband to Multi-Dwelling Units' is overlaid on the left side of the image.

# Effective Strategies for Providing Multi-Gig Broadband to Multi-Dwelling Units

## Introduction

As demand for high-speed broadband services grows, serving Multi-Dwelling Units (MDUs) presents a unique challenge for Broadband Service Providers (BSPs). Deploying broadband connectivity involves various options for infrastructure wiring, equipment space constraints, and security concerns. These challenges can result in high deployment costs, insufficient bandwidth, and difficulties implementing high-speed solutions like fiber, particularly in older buildings. This solution brief outlines the options for providing multi-gig broadband services to MDUs, regardless of the existing wiring infrastructure, with straightforward, cost-effective solutions that integrate smoothly with current operational workflows.

## Offering multi-gigabit broadband to MDUs is crucial

BSPs face various dwelling options within their serving area, including Single Family Units (SFUs), MDUs, and small businesses. As a BSP, one of the most important aspects of success is maintaining consistent service offerings and experiences for all subscribers in the area. This impacts every part of your business, including service tier offerings, provisioning, troubleshooting, and marketing. Ensuring service consistency reduces your Total Cost of Ownership (TCO) and creates opportunities to differentiate your solution.



In the case of MDUs, the fiber installed in the serving area can be severely under-utilized, where the number of homes passed can greatly exceed the number of homes actually served. The situation may, unfortunately, look all too familiar, especially in the case of older MDUs without a broadband offering that meets the needs of these tenants or residents.



**Figure 1:** Sample Under-utilized Serving Area

There are two deployment scenarios for MDUs. The first involves MDUs that are close to the main access fiber distribution hub and have fiber in the riser with individual fiber connections available to each living unit. This scenario is commonly observed in new construction or retrofitted buildings. The second case is the legacy MDU scenario, where the FTTP PON network is terminated at the building demarcation point; however, connectivity to the living units utilizes coaxial or twisted pair copper. In this case, replacing the legacy wiring is cost-prohibitive for the building owner; therefore, a more cost-effective solution is to leverage the PON network and deploy ONTs that serve as a gateway between the fiber and existing building wiring.

BSPs need an end-to-end solution that addresses both instances. The solution must encompass the connectivity required to deliver services to the units cost-effectively, along with a common operational model for you to manage tenant service provisioning, operations, and troubleshooting workflows throughout the network lifecycle. To deliver consistent, reliable services across your serving area cost-effectively, having connectivity is not enough; the operational workflows must be straightforward and consistent with the existing subscriber service workflows.

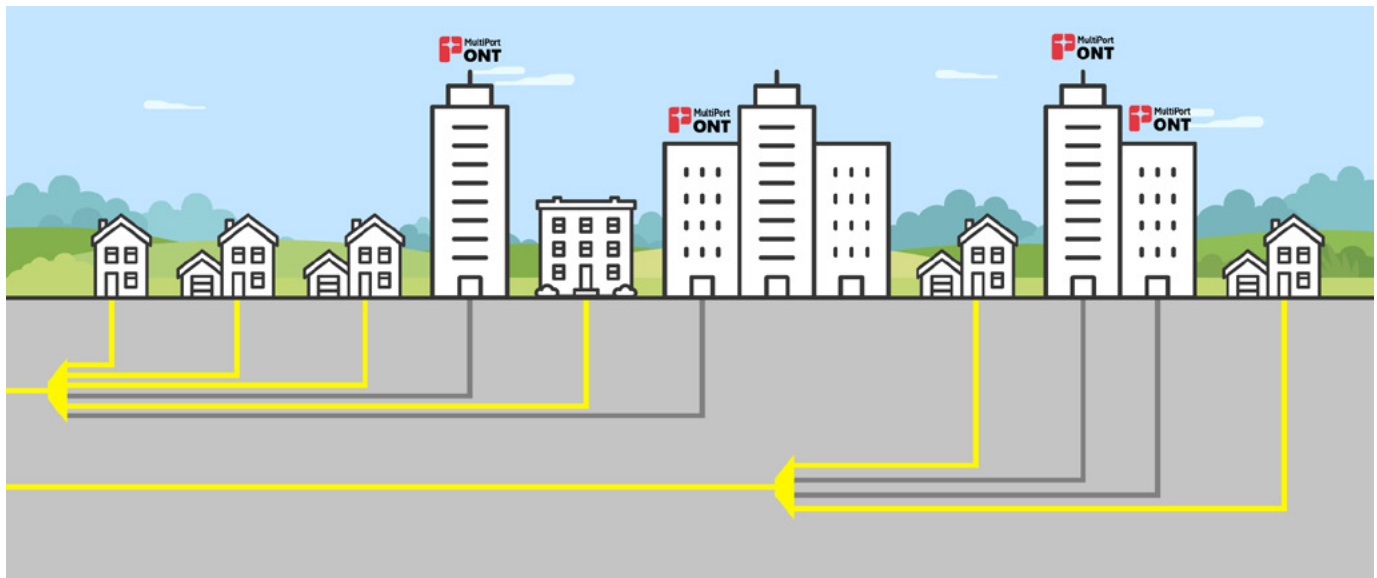
The following sections address the solution to both scenarios and present a straightforward, shared operational model for delivering high-capacity broadband and value-added services.



## Addressing the legacy MDU challenge with a purpose-built MDU ONT solution

For the predominant legacy MDU installed base, deploying ONTs to all the units requires costly fiber installations, resulting in unsustainable business cases and delays.

The solution is a purpose-built MDU ONT. Such MDU ONTs eliminate the need for multiple SFU ONTs and the necessity for rewiring the MDU. They integrate with the back-office Business Support Systems (BSS) and Operational Support Systems (OSS) that you have in place to operate your XGS-PON Fiber Access network. The MDU ONT devices enable end-to-end service delivery, from managing customer orders to ensuring the network operates like SFU ONTs. This integration is essential for you to provide your MDU customers with the same reliable and efficient services as you do to single-family homes or new builds. Purpose-built MDU ONTs unlock the delivery of broadband services to residents in MDUs and maximize subscriber take rates and revenue from the already-deployed FTTH network.



**Figure 2:** Deployment of Positron MDU ONT solution in legacy MDU scenario

## The Positron Gigabit Any Media (GAM) MDU ONT solution: Simplifying fiber services in legacy MDUs

The GAM solution transforms the existing telephone twisted pairs and coaxial cabling of older MDUs into a state-of-the-art gigabit ethernet infrastructure, allowing you to deliver gigabit broadband connectivity to each unit. The GAM behaves like an ONT (referred to as P-ONT in figure 3), allowing you to utilize the full symmetrical bandwidth of XGS-PON to provide multi-gig broadband to each subscriber and value-added services such as common area Wi-Fi and small business solutions as if there was a direct fiber connection. Supporting consistent service offerings enables your marketing efforts to be more efficient, unlocking the maximum ARPU from MDU subscribers and maximizing their Net Promoter Score (NPS), giving you the upper hand over your competition.

BSPs can utilize the full symmetrical bandwidth of XGS-PON to provide broadband services to subscribers as though they had a direct fiber connection. Additionally, service management is straightforward with no need to make any changes to IT back-office systems (BSS and OSS)—the Calix SMx and E-Series systems transparently manage the Positron Access MDU ONT solution. You benefit from a faster, more robust network without hassle.

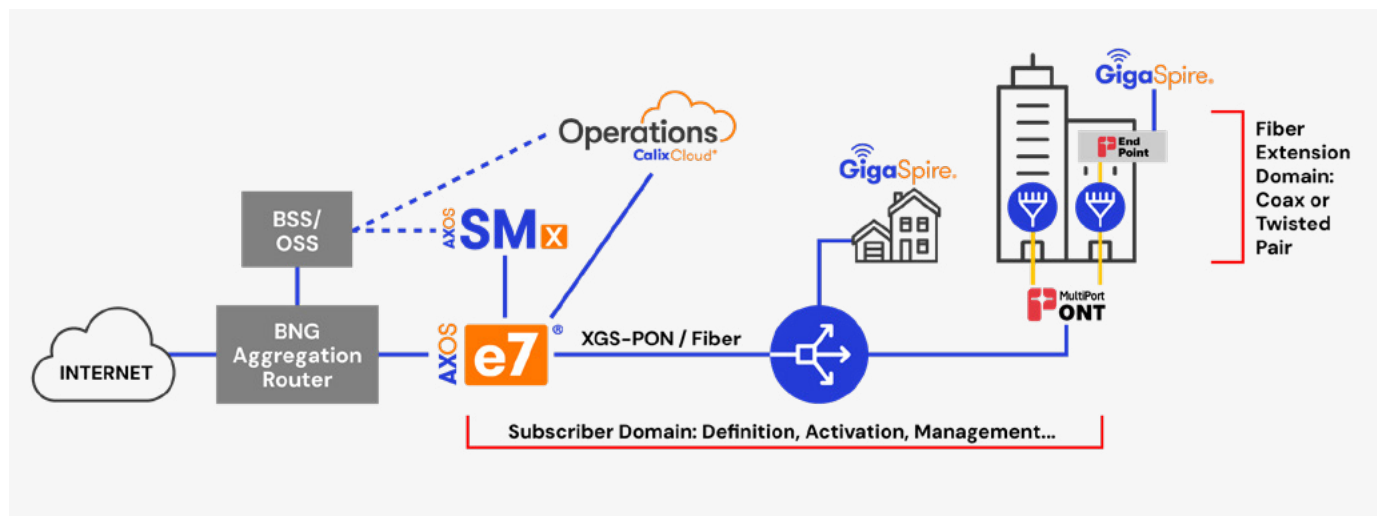
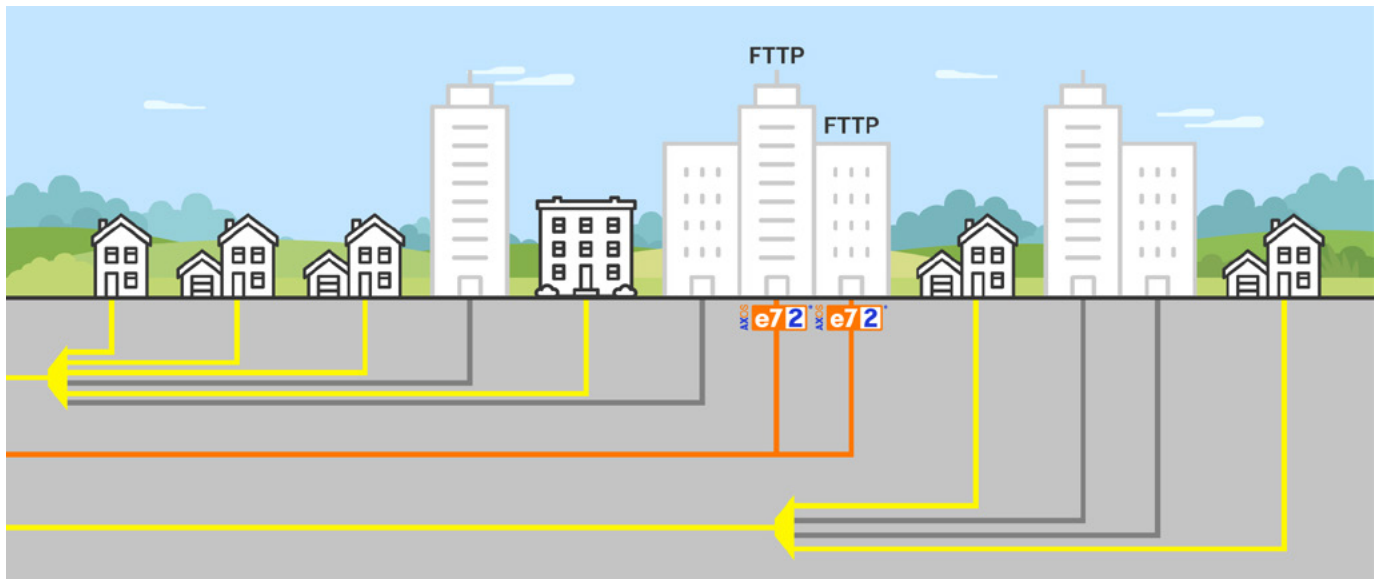


Figure 3: GAM Integrated MDU ONT solution deployment



## Addressing the all-fiber riser MDU challenge with an intelligent modular access solution

For MDUs equipped with fiber access and a fiber riser, there are significant advantages to deploying an on-premises OLT for broadband connectivity to all units. First, you can easily scale connectivity to additional units using multiple PON networks without being limited by the capacity constraints of a single PON network. This enables multi-gigabit broadband services for every unit. Additionally, you can deliver private line and value-added services directly from the OLT, which supports small business tenants, common area Wi-Fi, and other enhanced services, all on a unified infrastructure. Finally, this deployment strategy allows you to utilize telecom equipment rooms within the MDU, eliminating the need for external enclosures, leasing additional space, or constructing pads and power supplies. This approach reduces overall operational expenses and accelerates project completion timelines.



**Figure 4:** Deployment of Calix E7-2 System FTTP solution in fiber to unit MDU Scenario

## OLT considerations for all fiber riser MDUs

- MDUs have a concentrated set of living units but can offer low-density deployment for typical remote OLTs, supporting up to 2,000 subscribers or more in a servicing area.
- MDU count can vary from a few tenants to several hundred.
- Space and power are typically in utility areas and self-contained cabinets.
- OLTs have a low start-up cost.
- High availability network capabilities support a premium business service offering.
- These solutions address the need for small business services and connectivity in multi-use buildings.
- They support community Wi-Fi intelligent roaming on-premises, control security camera monitoring, and more.

The Calix E7-2 Intelligent Modular System offers economical PON start up options with the XG402 line card 4 port XGS-PON/GPON while leveraging the power of the Access eXtensible Operating System (AXOS). Using the XG402 supporting a 1:64 split ratio delivers up to 256 subscribers per card. Adding a second card allows for redundancy and supports up to 512 subscribers. Additionally, attached Ethernet services enable private line services to meet business and mobile requirements. The E7-2 is temperature hardened and offers a compact 1RU form factor that can easily fit in utility areas or server rooms.

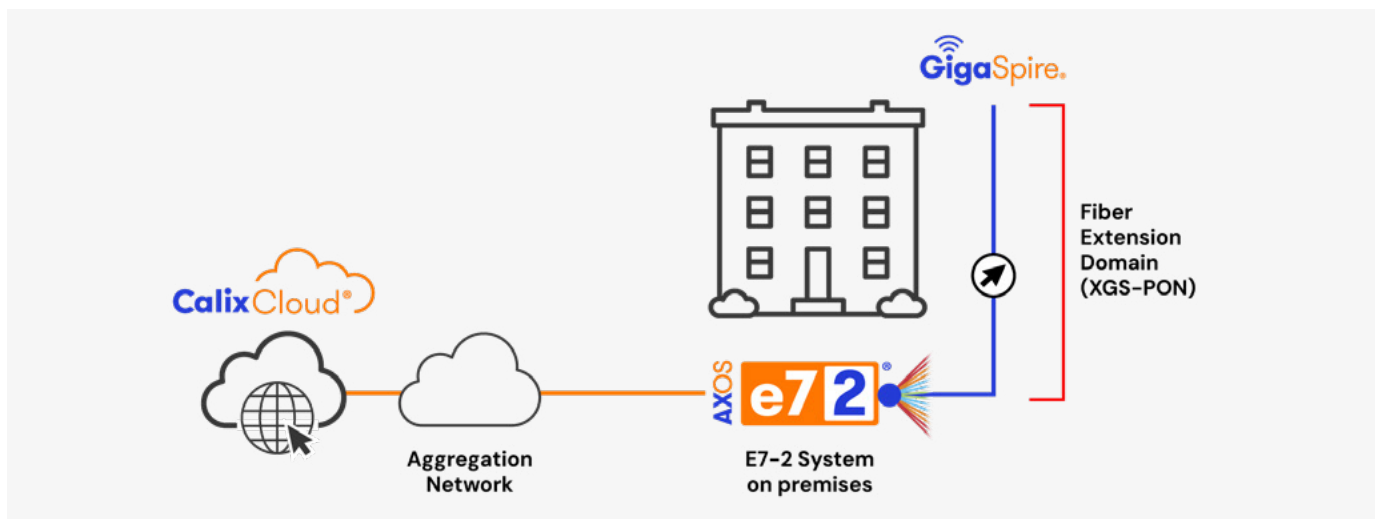


Figure 5: MDU on-premises broadband deployment leveraging fiber to the unit



## Simple solutions for streamlining operation

A critical aspect of supporting MDU services is ensuring that service operations are seamless and consistent with residential services. Systems that follow the same operational workflow models simplify the lives of broadband operations teams by standardizing provisioning, monitoring, troubleshooting, and customer support workflows.

The Positron Gigabit Any Media (GAM) MDU ONT Solution and the Intelligent Access MDU solution provide consistent operational workflows through the Services Management Connector (SMx) and Operations Cloud. They also utilize open APIs that facilitate straightforward service provisioning and facilitate fast back-office integration. Once the solution is fully integrated, since AXOS abstracts the underlying hardware, the back-office operation remains intact.

## Conclusion

The Intelligent Access solution, which integrates the GAM MDU ONT Solution, offers a game-changing MDU deployment innovation for BSPs. This comprehensive solution allows you to expand broadband services to buildings with any existing media connectivity (fiber, coax, copper) to the living units, ensuring the best possible user experience and converting previously unutilized MDUs into revenue-generating subscribers.

Learn more in the [Calix Broadband Platform E-book](#).



### About Calix

For over 25 years, Calix has enabled broadband service providers (BSPs) of all types and sizes to build thriving businesses and champion digital transformation. We believe every community should have access to simple, efficient, safe, and powerful broadband services regardless of economic status.

Today, Calix provides the world's only end-to-end broadband service delivery platform with cloud operations and managed services that democratize the use of data. This enables BSPs to operate efficiently, acquire subscribers, and deliver exceptional experiences.



### About Positron

Positron Access Solutions (Montreal-based) is a leading global provider of innovative technology solutions for Internet Service Providers and the Hospitality industry. We combine state-of-the-art XGS-PON / OMCI integration and interoperability with the Calix XGS-PON AXOS and Calix Cloud portfolio of solutions. The Positron Access standard-based Gigabit Any Media (GAM) solution and technology delivers gigabit ethernet services over the existing telephone or coaxial cabling infrastructure in legacy Multi-Dwelling Units (MDUs) with seamless integration with the BSPs existing Business Support Systems (BSS) and Operational Support Systems (OSS).

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