



# Utility rural ultra-broadband

Enabling community prosperity  
through gigabit broadband service



Broadband Internet access is essential for rural communities and smaller municipalities looking to prosper in today's connected global economy. Alcatel-Lucent's ultra-broadband fiber solutions help utilities provide citizens and businesses in underserved areas with gigabit service access, placing them among the world's elite communities. Ultra-broadband supports the improved economic development, education, and telemedicine opportunities that enhance quality of life while attracting and keeping jobs. It also provides the communications foundation for reliable, efficient smart grid electric services that bolster a community's economic development platform.

Alcatel-Lucent's proven end-to-end Fiber to the Home (FTTH) ultra-broadband gigabit solution enables voice, data and IPTV services, along with smart meter communications. Combined with Alcatel-Lucent's professional services expertise and experience, it bridges the digital divide, enabling utilities to deliver the socio-economic benefits of ultra-broadband to their communities.

# The challenge

Broadband Internet access is a given in today's major metropolitan areas, providing citizens with a new kind of superhighway that drives commerce, supports superior education and healthcare, builds economic prosperity, and enhances quality of life. However, rural areas and smaller municipalities saddled with "last millennium" communications technology face being left behind.

## SUPPORT ECONOMIC GROWTH

Many rural areas and smaller municipalities already have witnessed a steady exodus of people looking elsewhere for job opportunities. These communities may continue to shrink and flounder unless they are able to attract new businesses while retaining and nurturing the companies that already reside in the area. Ultra-broadband is key to building a strong and attractive communications platform that will allow businesses to compete on a global level, draw hi-tech employees by replicating the business broadband experience in their homes, and attract new businesses with reliable communications and power.

## ENHANCE ENTERTAINMENT, EDUCATION AND HEALTHCARE

Increasingly, citizens have come to desire and expect cutting-edge digital entertainment options and the quality-of-life amenities that stem from such services as video-enhanced education, distance learning, centralized records, and tele-medicine. Communities wishing to remain attractive to new generations of residents must be able to offer the broadband communications services that support these benefits.

## ENSURE PUBLIC SAFETY

Local government officials must ensure the highest standards in public safety, which include interoperability among multiple jurisdictions, agencies, educational institutions, and healthcare providers, along with smart policing, enhanced situational awareness, and the latest advanced public safety applications. Establishing high-speed broadband is critical to success in each of these high-priority missions.

## LEVERAGE SMART GRID TECHNOLOGY

Municipal utilities and electric cooperatives face the challenges of making their distribution grids smarter, more reliable, and capable of supporting renewable power sources while cutting demand peaks and thereby reducing supply costs – all capabilities that add to a community's economic value proposition to create a powerful magnet for new businesses. And, broadband communications can be leveraged to support smart grid technology, while consumer services generate the revenue needed to quickly recoup the broadband investment.



“The legacy of the rural electric cooperatives is that of bringing vital utilities to underserved communities. In the 20th century the need was for electricity and today the need is for high-speed, high-capacity broadband. Providing access to ultra-broadband will attract jobs and investment, improves lives through services like telemedicine and e-learning, and allows families to stay in the communities they love. When we first started looking at the scope of the ultra-broadband project, we knew we would need to rely upon expertise that we did not have. Fortunately for us, Alcatel-Lucent demonstrated both their ability and also a strong desire to help bring ultra-broadband to northeastern Oklahoma.”

**Sheila Allgood, Bolt Fiber Optic Services**

# Alcatel-Lucent's solution



The good news for rural areas and smaller municipalities is that ultra-broadband is within reach – especially when fiber to the home (FTTH) infrastructure is leveraged to support both utility and consumer services. Alcatel-Lucent's end-to-end Gigabit Express solution provides gigabit ultra-broadband access (100 times faster than the average connection speed in the United States) so that local citizens and businesses can join a group of the world's most connected communities.

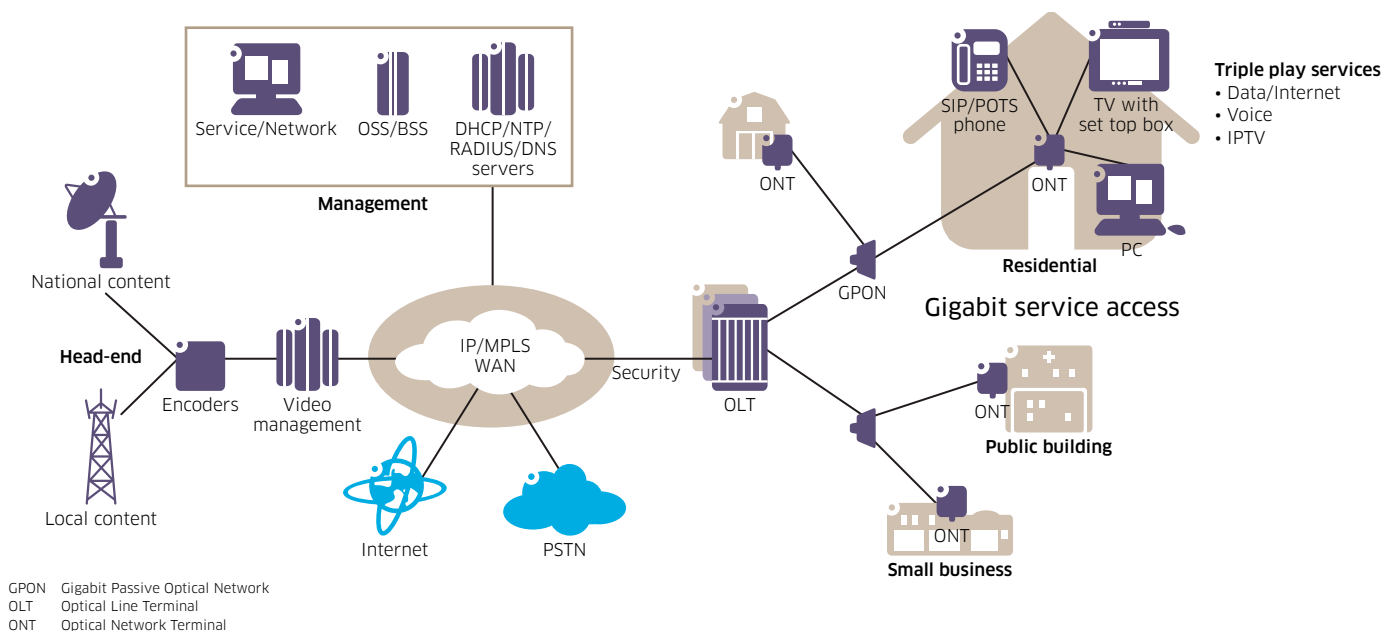
Cutting-edge consumer services include a triple-play solution with voice, data, and IPTV.

- In Opelika, Alabama, a gigabit FTTH network originally conceived for the municipal power utility, Opelika Power Services, already is generating millions in triple-play revenue, and expects to earn back its investment in less than five years through service to 5,000 customers.
- Dalton, Georgia's Optilink subsidiary currently provides over 12,000 customers in five counties with the region's only fiber-based broadband telecom services, which bring in about \$19 million annually.
- The Northeast Oklahoma Electric Cooperative's Bolt Fiber Optic Services will be supplying its 30,000 rural members with an end-to-end triple-play solution and gigabit ultra-broadband connectivity, placing them in an elite group of communities around the world with super-fast Internet access.

Residents of smaller communities like these can stay in the places they love, build their businesses, attract new industry, and preserve multi-generational family traditions – all while enjoying a better quality of life.

## Rural ultra-broadband gigabit service delivery architecture

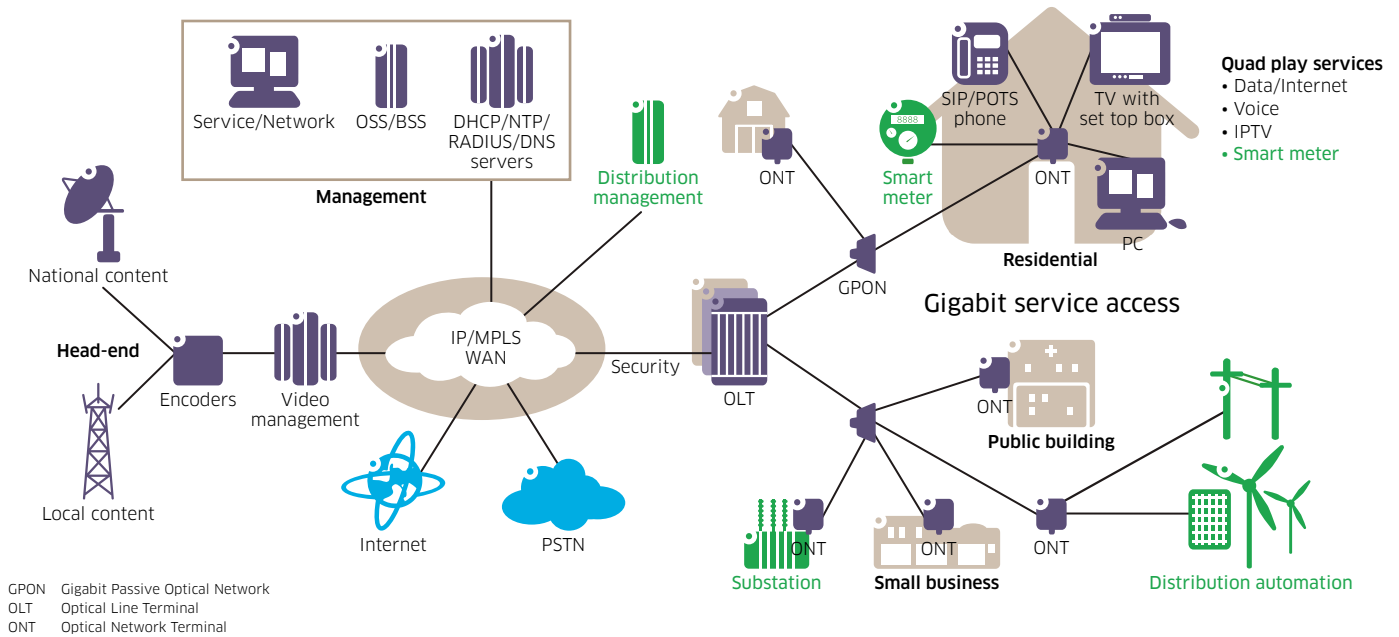
### Broadband services support



Once the fiber is deployed, utilities can add 21st-century intelligence to their electrical grids, ensuring mission-critical bandwidth, priority, and reliability for operational applications that include remote monitoring and substation automation, as well as teleprotection, the seamless integration of renewables, and smart metering for effective demand management. Consumer services include a quad-play solution with voice, data, IPTV, and smart meters for demand management.

## Rural ultra-broadband gigabit service delivery architecture

### Broadband services and utility operational applications support



## OPERATIONAL BENEFITS

The Gigabit Express solution will provide network capacity that is future-proof, safe, and easy to operate, designed to meet user requirements for decades to come.

- **Fast, economical operations:** The Gigabit Playbook and associated services allow operators to rapidly deploy services, saving time and money. Industry-proven tools and processes eliminate risks, especially if operators don't have expertise in broadband.
- **Complete, effective management:** One of the most critical components of a highly functional broadband network is a full set of management tools and capabilities to acknowledge, interrogate, and resolve issues immediately, addressing network problems before they can impact operations. Alcatel-Lucent offers industry-leading tools that simplify the management of complex networks while providing statistics and billing information that reduce costs.
- **Unmatched security:** Network security is critical for ensuring that services are reliably delivered with protection from potential threats and vulnerabilities, including uncontrolled or unauthorized peer-to-peer connectivity, theft of service, and denial-of-service attacks. To accomplish this, security elements from multiple vendors must work together seamlessly. Having designed and deployed hundreds of mission-critical security solutions for networks around the world, Alcatel-Lucent offers a superior understanding of what is required, offering a consolidated solution architecture that protects every aspect of the network.

Broadband access is the great equalizer, promising to affect rural communities in the 21st century as much as roads and highways did in the 20th, without compromising their small-town qualities.



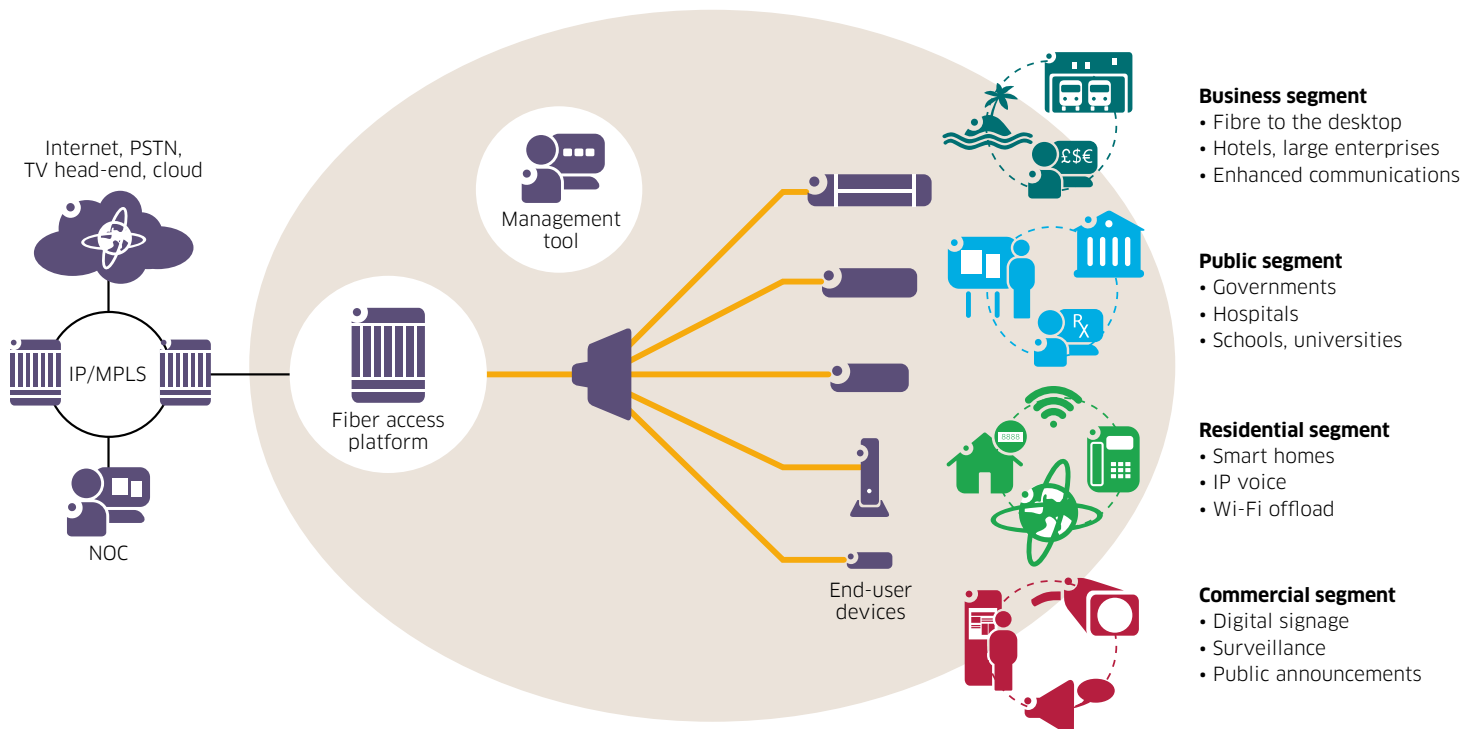


## SOLUTION DETAILS: THE ELEMENTS FOR SUCCESS

Alcatel-Lucent's Gigabit Express Solution has all of the building blocks to help communities of any size create a state-of-the-art gigabit network. It unifies products, services, and guidelines for faster and easier deployment, start-up, and operations. Its market-leading fiber access platform (7360 ISAM FX), end-user home devices (7368 ISAM ONTs), and access network management system (5520 AMS) are supported by an unmatched set of products and services:

- The highest capacity fiber platform in the market
- The Gigabit Playbook guidelines, which show how to provision and operate the network, including pre-defined configurations and guidelines for testing and troubleshooting in order to rapidly get services up and running
- Bell Labs Advisory Services to help plan, design and optimize each network for minimum cost and maximum return on investment
- Multiple access options – including passive optical network (PON), point-to-point Ethernet, and xDSL technologies – to best support specific applications.

## Alcatel-Lucent gigabit portfolio



# Steps in building a broadband network

The transformative benefits of ultra-broadband are within reach for smaller municipalities and rural areas. So, where do you start?

It's a step-by-step process.

## 1. Create your vision

Create a vision for where you want to take your network, whether it's triple-play only, or one that also supports smart grid with additional revenue sources.

## 2. Build your business case

Look at what resources you already have (people, fiber, etc.) and what you need. Talk to peers in other regions. Consider your choice of business models and funding sources, and then develop detailed numbers on the likely costs and revenue based on the experiences of other cooperatives or municipal utilities.

## 3. Conduct a feasibility study

Validate your business case by engaging an independent consultant to evaluate your particular marketplace. Use focus groups and local financial data to assure that your community will support the network you want to build.

## 4. Create your network architecture and design

Once you have validated your business case, design your network and take it to RFP. Evaluate bids and select a trusted, experienced partner with a proven track record to execute your vision.

Now deploy your network with a solution that may initially include daily operations support from a partner – a model that will allow you to deliver an excellent level of service as your organization builds its broadband skill set and experience.

## BUSINESS MODELS: OPEN ACCESS OR RETAIL?

When crafting your business plan, decide on whether to follow the open-access or full-retail model. With open access, the utility or a separate broadband entity owns the network infrastructure, but partners with or leases to other companies to provide consumer services over the network. In the full-retail model, the utility or separate broadband entity provides broadband services to customers. There also are variations on both models, with the utility providing some, but not all, services. Your best way forward will depend on your resources, regulatory environment and goals. Whichever model you choose, Alcatel-Lucent has the proven expertise to help you build and execute your plan.

## ESTABLISHING A FINANCIAL BLUEPRINT

This critical step in finalizing your business case identifies your funding sources. These can include municipal bonds, community loans, private investments, and grants by government agencies and programs such as the Rural Utilities Council and the Universal Service Fund. The more stakeholders you get on board with your plan – schools, hospitals and major businesses – the more funding options and success you will have. Consider local and state regulations as you determine the best corporate entity for funding and operations. If you're a cooperative utility you would most likely create a separate LLC to build the network, fund the loan, establish the business and run the fiber to the home business. One size doesn't fit all, so consult with a good telecom lawyer who is familiar with the state and local laws to help create the best financial entity for your purposes.

“Much of our original motivation to do this had to do with economic development and competition for services so that the citizens can have good, affordable options.”

**David Horton, Director of Opelika Power Services**

“Because Alcatel-Lucent has experience with other municipals in the same business, they’ve been able to give us help in developing our smart grid plans.”

**Hank Blackwood, Dalton Utilities/OptiLink**

# The Alcatel-Lucent advantage

Creating an ultra-broadband network that will serve the community for decades requires an experienced partner with a track record of delivering successful solutions. Alcatel-Lucent is powering some of the largest and most advanced fiber networks in the U.S. and in the world, with more than 30 years of experience in providing communications for utility operations and local broadband providers.

- In 2008 Alcatel-Lucent built the first Gigabit network in the U.S. for Electric Power Board of Chattanooga (EPB).
- Alcatel-Lucent is the number-one GPON vendor in U.S., serving many municipal and cooperative utilities and the largest service providers.
- Alcatel-Lucent is recognized by industry analysts and media as the leading FTTH vendor (1 in Gartner Magic Quadrant, and preferred FTTH vendor to 70% of top operators surveyed by Infonetics).

No other supplier can match Alcatel-Lucent’s breadth and depth of expertise and flexibility in providing solutions for broadband services to utilities.

## TAKING ACTION

A number of rural and municipal utilities already have successfully transformed their communities’ economic and social future with ultra-broadband. You can begin now. Talk to your peers and the vendor community. Go to webinars and seminars. Start to develop partners, and work with them to create references. Consider alternative solutions – look at wireless, fiber optics, or a combination of both. Consider the different skill sets that will be required for your transformation and look beyond the basics. Any community can reap the global socio-economic benefits of ultra-broadband, so why wait any longer? It’s time to get started.



Network with gigabit ultra-broadband access (100 times faster than the average connection speed in the United States) places a community in an elite group of communities around the world.