

AT&T Expands Fiber Broadband Options For MDUs

A new technology standard proves capable of accelerating the rollout of gigabit broadband to more MDU residents, extending fiber broadband speeds.

By Gary Bolton / *ADTRAN*

Today, according to the U.S. Census, 35 percent of all U.S. households live in multiple-dwelling-unit properties (MDUs) – apartments, condos, town houses or high-rises. That is about 44 million households and growing. Low vacancy rates are driving demand for new MDUs. According to the Freddie Mac Multifamily 2018 Mid-Year Outlook, 350,000 units were added in 2017 alone, an increase of 12.3 percent year over year.

It is no surprise that more than 50 percent of MDU inhabitants are 30 years old or younger. They grew up as digital natives and are always connected. They tend to use Uber and Lyft rather than owning cars or even having driver's licenses, and they are the "renter generation."

"There's a lot of demand coming from millennials," notes Ed Balcerzak, senior vice president of commercial and connected communities for AT&T Inc. "They seem to be staying in apartments longer than previous generations." AT&T has taken on the mission to be the leader in delivering gigabit connections to MDUs via fiber optics and is extending its gigabit fiber network to millions of customer locations. Coupled with the scale in TV service provided by DIRECTV and the substantial, untapped MDU market, this provides an outstanding opportunity for the company. So far, AT&T has delivered fiber to MDUs with a total of more than 1.5 million customer locations and continues to expand its all-fiber reach. "We're all in," says Balcerzak. "We certainly characterize it as a fast-growing segment of the market."

MDU HEADWINDS

Although MDUs provide tremendous demand with a strong concentration of bandwidth-hungry digital natives, installing fiber services within existing (brownfield) buildings can be extremely challenging and, in some cases, cost prohibitive. It is relatively easy for AT&T to install fiber in a new building while it is under construction, but the company faces a challenge in delivering gigabit services in existing buildings that do not have fiber, or even an existing pathway, to each living unit.

In these cases, in which rewiring existing buildings with fiber is prohibitive, there is typically already some type of phone or TV wiring infrastructure to every living unit – twisted pair, coaxial cable or both. In buildings that AT&T currently serves with DIRECTV service or in which cable TV is available, coax already connects to every living unit. Phone or data wiring connections are also available in most MDUs.

G.FAST TO THE RESCUE

G.fast is a next-generation broadband access technology based on an International Telecommunication Union (ITU) standard and designed to deliver gigabit speeds over existing copper wiring or coaxial cable for applications up to 100 meters. Tom Starr, a lead member of technical staff at AT&T Labs, is the chairman of ITU-T WP1/15, which has helped guide development of the G.fast standard. This new

technology enables AT&T to extend its fiber broadband service from a point in an MDU where there is access to existing home run phone wiring or TV cabling to each living unit.

G.fast eliminates the need to enter living units during deployment, which can be particularly challenging in condos, where access must be coordinated with individual homeowners, and thus reduces the potential for residents' inconvenience. Today, AT&T uses first-generation G.fast to provide internet speeds up to 500 Mbps in MDU applications, and it intends to offer gigabit services with second-generation G.fast solutions.

Second-generation G.fast solutions provide higher speeds than first-generation G.fast by doubling the usable spectrum (from 106 MHz to 212 MHz) and by allowing bandwidth to be dynamically allocated to either download or upload use on a subscriber-by-subscriber basis.

In addition, second-generation G.fast increases the number of subscribers that can be served simultaneously from each distribution point in the building, expanding the number of MDUs for which twisted-pair applications are possible. It also features greater power optimization, allowing service providers to meet the FCC's mandated power backup requirements for voice services by using reverse powering (customers' power sources), eliminating the need for space-consuming, expensive network line power/battery backup solutions.

All in all, G.fast can greatly accelerate the rollout of gigabit broadband to more MDU residents and extend fiber broadband speeds. In addition, because G.fast is an extension of a fiber network, MDU subscribers will benefit from continued advances in fiber optic capacity to their buildings. Today, AT&T utilizes GPON in its gigabit fiber network to deliver gigabit

speeds, but next-generation PON, which is not yet widely available in MDU applications, is expected to support speeds up to 10 Gbps and 25 Gbps in a few years.

G.FAST DEPLOYMENT HURDLES

Although G.fast allows service providers to deliver gigabit service over an MDU's existing wiring infrastructure, AT&T has had to overcome a few challenges.

Home run wiring – Not all buildings have usable coaxial cable or Cat 5 twisted pair.

Access to power – G.fast service distribution equipment placement is not always near a power source.

Home run wiring. Fortunately, 80 to 90 percent of MDUs are equipped with coaxial cable. Coax provides optimum performance for G.fast applications (see



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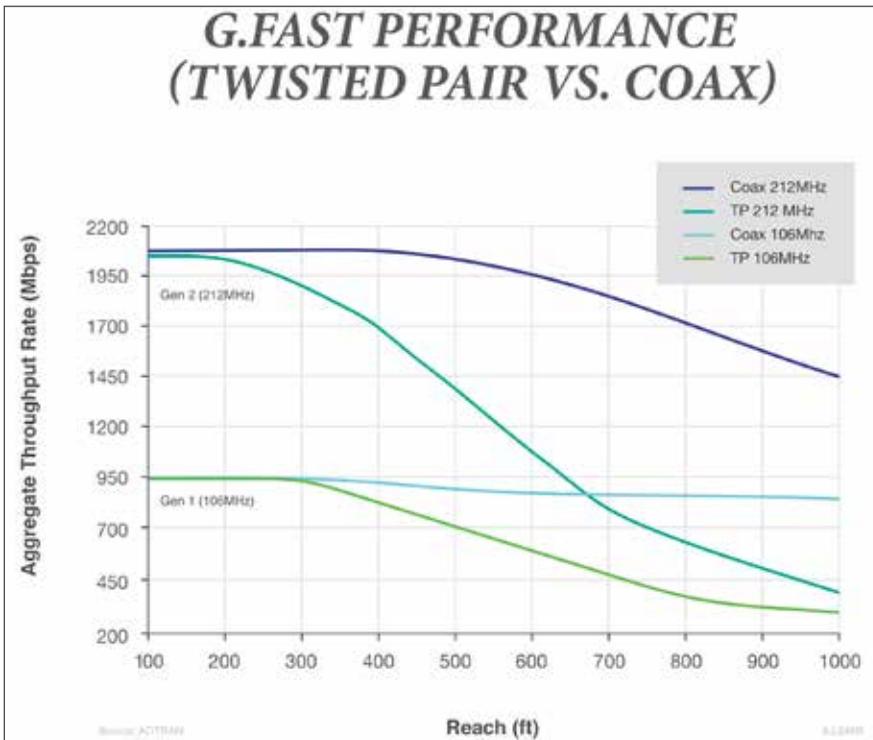


Figure 1: G.fast is compatible with either coaxial cable or twisted-pair wiring.

Figure 1). In some situations, where access to the existing coax home run wiring is not readily available, AT&T works with MDU property owners and other service providers to gain access to existing home run wiring via a shared termination panel.

Many MDU buildings also have Cat 5 twisted pair, which is ideal for copper pair applications. For MDU units that have neither coax nor Cat 5, AT&T has tested unshielded Cat 3 cable (station wire) and worked with its technology partners to deliver similar service speeds in these applications.

Access to Power. G.fast distribution point units require power, but access to commercial power and the required power backup can be an issue. Currently, AT&T uses span powering – applying commercial power over a copper “span” facility that is bundled with the fiber optic cable. This powering technique can be expensive, especially in small to medium MDU applications, and can require up to nine months to get a permit for use of the right-of-way and for the power company to install a commercial

power meter. As previously mentioned, second-generation G.fast supports reverse powering, which will speed up deployment and extend the application of G.fast to smaller MDUs.

A NETWORK BUILT IN SOFTWARE

AT&T is an industry leader in the quest to transform network and operations to align with software-defined networking (SDN) and network function virtualization (NFV) initiatives. G.fast is fully aligned with that vision. AT&T deployed G.fast using software-defined access (SD-Access) principles to allow the technology to be open, programmable and scalable.

Using an SD-Access architecture allows AT&T to enjoy the network economies of data centers and the service agility of cloud providers as it deploys G.fast and fiber broadband services. Service architectures based in software, such as that used with next-generation G.fast and fiber broadband, allow services to be delivered in a more user-driven, application-based model.

SYNERGIES WITH 5G DEPLOYMENT

As AT&T builds out the deep-fiber infrastructure needed for small cells and 5G deployments, a valuable byproduct is the increase in the addressable market for MDUs. 5G applications require dense fiber buildout to deliver high-bandwidth, ultra-low-latency capabilities for mission-critical applications such as autonomous vehicles, the internet of things and video-rich enhanced broadband. MDUs are often in locations where 5G is needed most. Close proximity to fiber results in lower cost to deliver gigabit fiber services to MDUs and a greater return on investment.

BUILDING OWNERS BENEFIT

Although the benefit to MDU residents of more choice of services and higher internet speeds is evident, an MDU owner also benefits from providing residents with a highly desired amenity. A recent study finds that fast, reliable broadband can add 8 percent to an apartment’s rent and 11 percent to the net income per unit. (See Fiber Broadband Association/RVA LLC Market Research: Tangible Value of Advanced Broadband to MDUs.)

G.fast is being deployed by top service providers around the world in nationwide service deployments. AT&T is already using fiber to enable millennials and other MDU residential broadband residents with gigabit service across the nation. Now it is deploying G.fast to offer up to 500 Mbps internet access service in MDUs and expects to offer gigabit G.fast services in the near future. AT&T has worked hard to iron out the challenges of MDU broadband deployments, which will accelerate the availability of these exciting service capabilities. ❖

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