Case Study: Connexion Technologies

Bringing Leading Triple Play Services to an Existing Apartment Community Using Fiber and HomePNA over Coax

Connexion Technologies is not your father's infrastructure provider. It isn't a service provider either. Connexion provides leading edge communication infrastructure installation and management services to the owners of mostly existing residential "communities" enabling them to offer cutting edge triple-play TV, Voice and broadband access services to residents with a minimum of disruption and inconvenience.

Established in 2002, and employing almost 500 people, Connexion was listed in 2009 and 2010 as one of *INC* Magazine's 500 fastest growing private companies in the United States. Connexion currently installs approximately 80,000 living units a year in a diverse group of communities that includes new and existing single family homes, multi dwelling unit (MDU) multi-family and high-rise buildings, and manufactured housing units in over 30 states.

This case study provides an overview of Connexion's application, value proposition, and technology. It concludes with a description of its solution for updating and future-proofing TV, voice and Internet access services for The Mandolin, an existing 390-unit apartment complex.

The Application

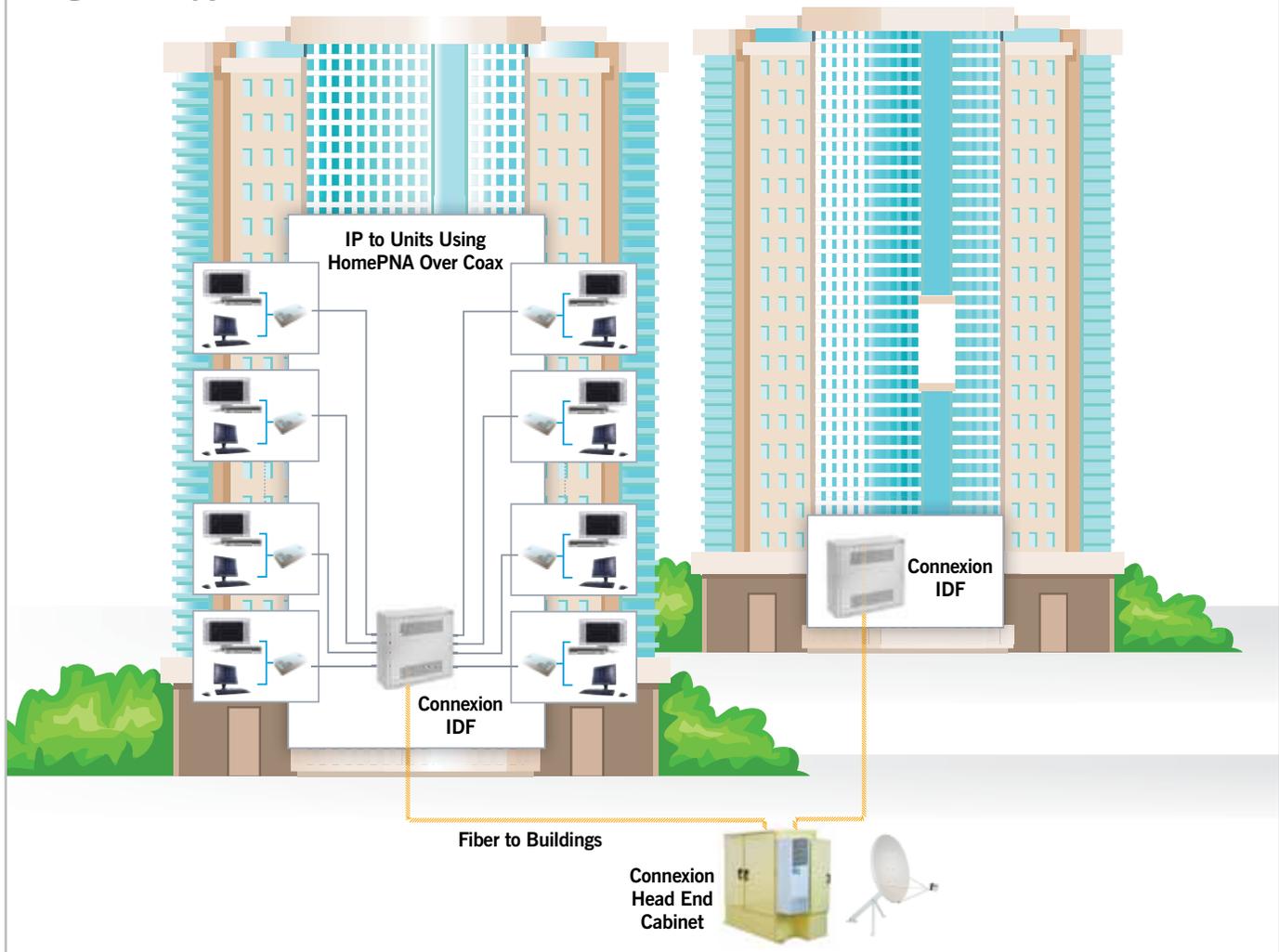Connexion is an overbuild infrastructure provider that focuses on retrofitting advanced communication services into existing buildings. Overbuild, in this case, means that Connexion is installing telecommunication equipment enabling services from an alternate service provider to be offered in another service provider's territory. Leveraging the industry transition to triple-play services, Connexion, has developed a rapidly growing business that enables digital television, VoIP telephone, and broadband access services from their partners to be provided to individual residences over their provider-neutral networks.

Connexion installs fiber on and off their customers' properties to connect communities with their central office. As shown in figure 1, connection to individual living units is largely done using HomePNA technology over coax cables already installed in the buildings (many of the buildings aren't wired with CAT 5 cable, but almost all are wired with coax).

Connexion's fiber terminates at an intermediate distribution frame (IDF), the point in the network where the fiber from the central office connects to the coax cables that lead to the living units inside the building. The location of the IDF depends on the nature of the community. It may be mounted on a pedestal for a community of private homes or attached to the side of a building along with the other utilities for an MDU application.

The actual services that run over Connexion's network are supplied by national service providers such as DISH Network, DIRECTV or telcos such as CenturyLink. Connexion might

Figure 1: Typical Connexion Overbuild Installation

IP to Units Using HomePNA Over Coax

Connexion IDF

Connexion IDF

Fiber to Buildings

Connexion Head End Cabinet

partner with established equipment vendors such as HomePNA members Alcatel-Lucent, Cisco, Motorola, Alpha Telecom or others depending on the requirements of the specific installation.

The Value

Connexion sells its business by providing property owners with a big value-add: more enhanced services that can provide the property owner with new revenue opportunities. For example, a property owner may be able to buy "basic" cable service in bulk from a service provider and include it at a competitive rate in the monthly rent. It could then provide HD, broadband, and voice for additional tiered fees. The property owner may also be able to charge a higher rent based on the enhanced services; the net being a higher property value.

Connexion's other rule is to "upgrade without disruption" since residents often resent having holes drilled in their walls no matter how courteous the installer. Along with minimizing resident discomfort, Connexion strives to reduce property owner effort. It provides installation services and technical support with trained technicians and a 24/7 call center. Strict Service Level Agreements (SLAs) are often part of the deal enabling property owners to guarantee residents a quality experience. Then there are the other benefits, like no more dishes on balconies, because aesthetics do matter.

Figure 2: Connexion Head-End Cabinet

The HomePNA Business Case

To minimize cost and complexity, Connexion needed to deploy a minimum number of technologies and equipment types. Its core technology is fiber and they required a complimentary technology that would bridge the "last hundred feet" between the fiber termination point and the living units. The ideal technology would serve the majority of its applications; from private homes to garden apartments to luxury apartments in large MDUs.

The technology had to be simple to deploy, robust to minimize installation time and service calls, and low cost to reduce expenditures. It had to connect multiple pieces of consumer equipment such as WiFi routers, set-top boxes, and IP telephones in the living unit itself in addition to providing access to the units. And finally, the solution had to use existing wires since the goal was to overbuild the property without tearing it up.

Connexion considered the types of existing wire technologies available — coax, phone wire and powerline — as well as different technologies that run over those wires. Powerline was rejected due to its susceptibility to noise. Phoneline, while an acceptable medium, was rejected because of potential issues over ownership of the wire.

HomePNA over coax provided the optimal solution: a high speed, reliable communication protocol with guaranteed quality of service (QoS) running over a high quality transmission medium already installed in buildings' walls with clear ownership. Coax

provided an additional benefit — convenient connections were often already located near networked communication, computing and entertainment equipment in the living units.

"HomePNA has proven to be a very effective solution for us," said Dan Waugh, vice president systems integration and delivery at Connexion Technologies. "It addresses the wide range of our applications and doesn't break no matter how big we scale it."

The Property

The Mandolin, located in Houston, Texas, provides a good example of the added value and incremental revenue Connexion can bring to property owners. The Mandolin is a 390-unit apartment community managed by the Lynd Company, managers of over 38,000 apartment units in 11 states. It is comprised of 19 garden-style three story buildings.

When the Lynd Company purchased the property in 2007, residents were receiving cable TV, Internet and phone services over a traditional coax network. "We always walk the properties

HomePNA Features

- ✓ Data Rates up to 320 Mbits/sec
- ✓ Guaranteed QoS
- ✓ Supports Remote Diagnostics and Management
- ✓ Operation over Coax and Phone Wires
- ✓ ITU Standard G.9954

we're buying, and as we did, we talked to the people living there," said David Lynd, chief operating officer. "They asked us if we were going to update the cable and Internet…. We got the sense that this was a tech-starved community." Connexion enabled the new enhanced services to be deployed 90 days after the contract was signed.

Residents have benefited and so has the Lynd Company. It collects an additional $45 per unit for basic TV service increasing the asset's value by more than $1 million. Rents at the property have also increased approximately 10 percent — something Lynd attributes, in no small part, to the rollout of the new system."

The Installation

At The Mandolin, Connexion Technologies integrated Prime-cast's Voice and Data products with DIRECTV's IPAdvantage™ head-end (HE) for a complete IP triple-play solution for MDUs. The HE equipment which converts DIRECTV programming into IP video streams is located in Connexion Technologies' HE cabinet, shown in figure 2, located on the property.

The technology allows a single set of satellite dishes to be located next to the HE equipment cabinet instead of on balconies improving curb appeal. All three IP based services (IPTV, VoIP, and broadband Internet access), are transported over fiber from the compact (roughly five feet by five feet by three feet deep) HE cabinet to the individual IDF cabinets which are attached to the buildings. The 1 Gigabit per second fiber infrastructure is expandable to higher data rates as services expand.

The IDF, shown in figure 3, is a commercial enclosure roughly three and a half feet high by two and a half feet wide by a foot

Figure 3: Connexion IDF Cabinet

deep. It contains the network components including the fiber termination components, rack-mounted HomePNA equipment, and an Ethernet switch, required to deliver the IP streams to the living units. The IDF also contains an uninterruptible power supply (UPS) shown in the lower left, remote temperature/humidly/door sensors, and various custom mechanical fittings.

The IP data streams are transported to and throughout each living unit using HomePNA over existing coax. The HomePNA implementation provides each living unit with ample bandwidth for transporting multiple HDTV streams to each TV with guaranteed quality of service for Voice and IPTV services.

The HomePNA™ Alliance is a community of leading technology companies, original equipment manufacturers (OEMs) and service providers working together to develop, promote and support home networking solutions based on internationally recognized, open and interoperable HomePNA standards.

Connexion Technologies customizes and manages advanced communications networks in residential properties nationwide. Its networks optimize the communication experience and value of properties for residents and owners. Connexion Technologies is not a service provider, rather it selects and manages providers that offer entertainment and communication applications, including enhanced television, telephone and Internet services over Connexion's provider-neutral networks. The company is based in Cary, North Carolina. It was established in 2002 and serves properties nationwide. www.connexiontechnologies.net