



IDC TECHNOLOGY SPOTLIGHT

Next-Generation Wireless in MDUs: A Necessary Differentiator

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Multi-dwelling units (MDUs) require wired and wireless networks that can readily accommodate a litany of tenant demands. Residents of student housing complexes, luxury apartment and condominium communities, military and mining barracks, and senior living communities expect seamless connectivity to a growing array of devices and applications. In many cases, the inclusion of high-performance WiFi as a housing amenity can be a factor in choosing a particular MDU community, and it will only continue to be so. However, MDUs must solve a number of challenges, such as scale, coverage, density, and multi-tenancy. Thus it is important for technology decision makers within MDU development and management companies to select vendors and service provider partners that understand the intricacies of this segment. This IDC Technology Spotlight explores the role that Ruckus plays in the MDU WiFi market.

Introduction

In today's world, increasingly populated by digital natives, WiFi is deemed as important as oxygen. As today's digital citizens seemingly manage the entirety of their lives through mobile devices and applications, there is an expectation that WiFi access will be ubiquitous and reliable. Naturally, reliable WiFi connectivity is expected to start at home. For managers of MDUs, this means ensuring that pervasive, reliable, and secure WiFi is easily available for all residents and highly manageable for the IT team. Given how digital transformation (DX) and its flood of devices and applications are changing how enterprises and consumers use technology daily, MDUs can realize tremendous benefit from a network refresh revolving around end-to-end WiFi for business operations and for residents.

MDU property owners are seeing an imperative to take advantage of "bulk WiFi," which means they purchase multi-tenant WiFi access across their properties, reselling it at an attractive cost to residents and thereby monetizing a necessary investment in WiFi infrastructure. Pervasive enterprise-grade WiFi has multiple impacts in the MDU space. It allows MDUs to stand out from their competition by offering a more seamless networking experience for their connected residents, layering on Internet of Things (IoT)-based network services (such as connected home and touchscreen support kiosks) as well as corresponding security and access control functionalities and ensuring high all-around WiFi security and service levels.

However, any MDU bulk WiFi investment and deployment must be considered carefully. MDU implementations can come with challenges, including buildings that are not designed to propagate RF signals well, such as older buildings and some "green" buildings. Some properties will require extensive installations or upgrades of underlying infrastructure such as cabling and switching. Multi-tenancy management will need to be in place to ensure secure, high-performing WiFi in an environment of many individual "home" networks within the larger network, and some decision makers may be skeptical of the need to offer a WiFi service to residents. Thus, MDUs must carefully choose a solution attuned to their market's specific needs and challenges.

MDU Trends Illustrating the Need for Bulk WiFi

Home network usage has achieved a high level of penetration in many regions. According to IDC's *Worldwide Home Networking Forecast 2016–2020*, the number of network-connected households worldwide will grow from just under 500 million in 2015 to almost 700 million in 2020. When residents move to a new home, one of the first tasks that they tackle on their to-do lists is setting up their home network, which is usually accessed through WiFi. Given the highly self-service nature of home networking, many MDUs have a de facto "bring your own WiFi" (BYO WiFi) strategy, which leads to a mishmash of off-the-shelf equipment and managed network gear from managed service providers (MSPs) in MDUs across the world.

This strategy can create problems. Disparate WiFi networks that co-exist in confined quarters can create interference and performance issues. BYO WiFi also entails do-it-yourself (DIY) network security on a per-residence basis, which leads to inconsistency and can expose all residents to security vulnerabilities. Moreover, BYO WiFi is limited to one unit and does not allow for seamless access as residents roam to common areas, such as the gym, pool, business center, or study area.

It is also true that MDU markets such as student housing or luxury apartments are intensively competitive. These properties regularly play up amenities such as sparkling pools, brand-new gym and recreational equipment, and smart appliances. There is a high level of choice in certain MDU segments. Off-campus student apartment communities, senior citizen housing, and luxury apartment communities in desirable cities are among the most competitive MDU segments. To attract discerning prospective residents, property owners need to be on the bleeding edge of innovative amenities. Offering high-performance WiFi as part of the package can be a crucial differentiator that may be the deciding factor in a resident's ultimate decision on where to live.

This is especially true as digital natives reach the age where they look for housing. These are individuals who have grown up with the internet and who regard social media, video streaming, and other mobile applications as natural parts of their daily routines. Regardless of generation and MDU setting, residents are also owning more wireless devices and are relying on an expanding roster of mobile applications, including bandwidth-heavy multimedia applications. Similarly, "always-on" IoT devices (both resident owned and property owned) are an increasing presence in MDU networks. IoT devices present additional challenges to the MDU network given their potential for immense scale and "headless" nature (i.e., connecting to the network without human intervention). Thus MDU networks now require a cohesive and scalable enterprise-grade security framework designed with IoT in mind.

Furthermore, MDUs need specialized tools to manage multi-tenancy. That is, they must be able to design and manage the RF environment to reduce interference while being able to monitor the network in a highly segmented fashion. Tenant turnover is also a fact of life in MDUs, so the ability to quickly and securely reprovision, reconfigure, and redeploy WiFi infrastructure is a necessity. Challenging RF environments are yet another consideration for some MDU decision makers because some deployments may include older buildings that are being converted to MDUs or older MDUs that are being retrofitted with WiFi.

MDUs want to meet RF, security, and multi-tenancy challenges. At the same time, MDU IT teams must round out the business case by proving a low total cost of ownership (TCO), developing the monetization potential of the network, and finding an architecture that fits well with the specifics of their deployment and provides the flexibility to adapt the network as needs change. As such, IDC advises MDUs to examine wired and wireless network solutions that have been tested and proven against the needs of MDUs.

Benefits of a DX-Enabled Wired and Wireless Network for MDUs

An enterprise-grade, best-of-breed wired and wireless network solution can lead to an improved MDU resident experience. Today's residents use the network to complete coursework, telecommute, surf the web, deploy smart appliances and other IoT devices, and obtain services over WiFi (e.g., maintenance requests and package retrieval and even medical assistance in senior communities). Across all segments, video streaming services such as Netflix and YouTube are set to consume an outsized share of MDU bandwidth. According to IDC's *U.S. and Worldwide Networked Video Forecast, 2016–2020*, the number of U.S. households consuming networked video applications is projected to more than double from 25.2 million in 2015 to 52.0 million in 2020. Worldwide, the number is expected to more than triple from 118.9 million to 369.7 million within the same period. This trend will play out in the MDU market. An optimal MDU wired and wireless networking solution allows residents to experience high-quality video with no jitter and low latency, and it allows the MDU to optimally prioritize and segment multimedia traffic.

A modern, purpose-built enterprise-grade wired and wireless network also provides MDUs with opportunities to achieve greater operating efficiencies on the back end. Today's network can enable next-generation collaboration and communication, cloud-hosted enterprise applications, smart utilities, secure payment processing, and asset tracking, among other transformational capabilities. Moreover, MDUs can harness the benefit of WiFi-driven location-based services to connect residents to local resources and create cross-promotional opportunities that further monetize the network. The net effect of combining the functionalities of multiple, siloed, disparate systems, each requiring its own network, onto IP-based solutions running on an enterprise-grade wired and wireless network is greatly reduced opex over time.

Considering Ruckus

Ruckus has a history of providing high-performance WLAN infrastructure to MDUs. It also offers a comprehensive wired networking portfolio. Ruckus has a full portfolio of WLAN architectures covering the spectrum of enterprise needs, including controller-based, controller-less, and cloud-based solutions, equating to architectural flexibility and choice. If controller architecture needs change, access points (APs) can be migrated to a different architecture with minimal disruption to WiFi service.

Ruckus offers numerous products and solutions that are well-suited to MDU deployments:

- **BeamFlex+ technology for residential units and public spaces.** Ruckus APs incorporate BeamFlex+, an adaptive antenna design containing multiple elements that electrically manipulate antenna properties to create optimal patterns for each device with which an antenna communicates. This technology enables the antenna system to continually sense and optimize for its environment, mitigating the effects of interference, noise, and network performance issues. As a result, APs in apartments and common areas can deliver increased performance and range, clear voice and video communications, and maximized power efficiency. BeamFlex+ is an enhancement to BeamFlex adaptive antenna technology that provides adaptive support to mobile devices. BeamFlex+ enables Ruckus wireless access points to further adapt to client device orientation in addition to client device location.
- **Ruckus PD-MRC.** PD-MRC (polarization, diversity, and maximal ratio combining) optimizes WiFi signals for mobile devices that tend to frequently change their orientation with respect to the transmitting AP. No matter the orientation in which a mobile device is held, the Ruckus system delivers a properly polarized WiFi signal that ensures the highest performance and throughput.

- **Wall-plate APs.** Ruckus has a multi-tier lineup of indoor wall-plate wireless access points to fit MDU needs. The fourth generation of indoor wireless access point, the Ruckus H320, includes the latest 802.11ac Wave 2 technology to meet the needs of the modern MDU resident. The Ruckus H320 is designed to be in every room and provide the speeds required by today's MDU resident. In addition, the Ruckus H510 is a 2x2 Wave 2 802.11ac dual-band concurrent wall switch in a sleek, rental unit–friendly form factor that includes integrated PoE (standard 802.3af). Gigabit ports enable the connection of additional devices.
- **DOCSIS 3.0 APs.** Ruckus offers APs that conform to DOCSIS 3.0 standards, allowing venues that have challenges due to cost constraints and historic buildings to have access to high-quality WiFi by making use of their existing coaxial cable infrastructure. These APs integrate a cable modem and a wireless access point in one unit to simplify installation and management of DOCSIS-based solutions. Ruckus is a certified DOCSIS partner vendor.
- **Outdoor APs.** Ruckus offers the ZoneFlex T300, a rugged, dual-band 2x2:2 802.11ac AP with an integrated BeamFlex+ adaptive antenna system and SmartMesh technology that reduces the need for backhaul cable runs. For higher capacity and performance, Ruckus also offers the T301, T610, and T710 series of outdoor APs.
- **On-premises and centralized management.** End customers and managed service providers have the flexibility to choose between Ruckus ZoneDirector or SmartZone physical controllers located on-premises and SmartZone virtual controllers, which can be located on-premises and/or centralized in a datacenter or private cloud. Organizations have the flexibility to transition from one control architecture to another as needs change.
- **OpenG and CBRS support.** OpenG is a new Ruckus technology that can vastly improve mobile coverage and capacity inside buildings. It utilizes shared spectrum on the CBRS band and enables venues to deploy an LTE network with the simplicity of WiFi. It can improve coverage, roaming, and quality of service (QoS) within densely populated MDUs in a more cost-efficient manner than distributed antenna systems (DAS) or mobile network operator (MNO) small cells.
- **Analytics.** Ruckus SmartCell Insight (SCI) is the company's network analytics platform. SCI automatically collects data from across the network and generates reports based on established profiles and policies with selectable data granularity. SCI offers the ability to customize reports based on specific business needs as well as integration with BSS/OSS to provide valuable network data to business intelligence tools.

Challenges

As with any nascent technology initiative or proposed project, it is imperative to gain stakeholder support. It is not uncommon for there to be skepticism among decision makers. Some stakeholders may not understand the business case for MDU WiFi, especially given the trend of "DIY WiFi" and the different technology usage trends of digital natives versus nondigital natives. In addition, they may not understand the value of network monetization opportunities and how to operationalize them. Furthermore, stakeholders may be concerned that they are unable to add or access the resources needed to support tenants when problems occur on the network. Partners (e.g., resellers, integrators, and managed service providers) must proactively offer tools and assistance so that these concerns can be addressed on the front end.

An additional consideration is that even though MDUs have a common set of challenges, each MDU specialty has a more specific set of use cases and concerns. MSPs and resellers targeting the MDU space must be cognizant of this. According to an analysis of the data from IDC's 2016 *Consumer Internet of Things Survey*, properties catering to the 55+ age bracket may see lower device counts than properties catering to millennials; it follows that their respective network designs

would be different. Similarly, senior communities and military communities may have additional regulatory compliance requirements that affect how their networks would be deployed. MSPs and resellers must proactively assess these challenges and offer relevant solutions to be able to succeed in this space.

Conclusion

The digitization of the modern world means that the network must serve as an "always-on" utility. MDUs, from student housing to luxury apartments and military barracks to senior communities, have an opportunity to stand out in a competitive market while improving the quality of life of their residents and the efficiency of their daily operations. MDUs considering implementing a best-of-breed wireless network should evaluate Ruckus and its end-to-end wired and wireless network solution set designed for the demands of digital transformation.

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