

# IMPLEMENTING A ROBUST WRELESS BACKBONE

(A Three Volume Set)

# A Strategy For Senior Living **VOLUME 2 - WHAT**



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# By HealthSignals, LLC



# **Notes**



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ISBN-13: 978-1-952281-30-3



## Notes

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# Introduction

In Volume 2 we are going to focus on "<u>What</u> is a Robust Wireless Network".

In 2013, a Gartner Analyst said that in a few years, 80% of newly installed wireless networks would be obsolete due to a lack of proper planning. We are already seeing evidence of that in our conversations with customers today. This is a costly mistake! You need to plan for the future in terms of medical privacy and security and in terms of the changing demographics of retirement communities.





# Introduction

The move toward electronic health records is well underway and has been growing steadily since the Health Information Technology and Clinical Act was implemented in 2009. This trend could bring more senior living communities under the umbrella of HIPAA (if you're not already subject to it). Where physical and behavioral Protected Health Information (PHI) measures may be sufficient compliance solutions to protect paper-based PHI, electronic health records and ePHI require medical-grade network security.





# Introduction

At the same time, Baby Boomers, who are well versed in technology and its ability to enhance their lives, are reaching retirement age (65) at a rate of about 10,000 per day according to <u>AARP</u>. They're not going to give up their laptops, smart phones, tablets, and wireless gadgets as they age. Moreover, new lifestyle, wellness, and medical wireless devices are constantly being developed.

According to the Pew Research Center, 80% of younger baby boomers and 75% of older ones regularly use the Internet. Even the older generations, the Silent Generation and the G.I. Generation use the Internet at rates of 58% and 31% respectively. Baby Boomers are connecting wirelessly, downloading apps, using social network sites, getting their news online, streaming video, and connecting with their loved ones via technology -- and this generation represents the next wave of incoming residents for your facility.





# Introduction

While providing wireless services to residents is a good first step, you also need the ability to protect electronic health records and ePHI in compliance with HIPAA. If your facility is not subject to HIPAA yet, it could very likely fall under its umbrella in the near future. Failing to plan for this would be a costly mistake.



Proper planning now can help you avoid investing in an obsolete solution while also allowing you to exceed the expectations of your tech-savvy residents and protect the most sensitive information of all your residents... now and in the future.



# Introduction

Moving into a senior living community is a huge decision that is not taken lightly. One of the overriding concerns for many seniors is whether they will be able to enjoy the same quality of life they did while living in their own homes. Whenever and however possible, providers should strive to offer an experience that helps residents *improve* their previous quality of life.

One way to do that is to offer a Wi-Fi and overall digital experience that is superior to their previous cable connection. Emphasis should be placed on the benefits of doing so:

- Better data security
- Less interference
- Fewer dropped connections
- Lower costs
- Increased speed and greater bandwidth
- Improved quality consistency





# Introduction

In other words, "just like home" can be improved upon by offering a private and secure network that lets phones, laptops, tablets, smart TVs, Chromecast, wearables, connected speakers and more, seamlessly connect to Wi-Fi and effortlessly communicate with each other.

What does it take to deliver this Solid Wireless Network Backbone? Let's look at the tenets of a Medical Grade Wi-Fi<sup>®</sup> network platform:

- Coverage across your campus, including inside all residential units
- Signal Strength
- Capacity/Speed
- Security of data and communications
- Redundancy/Reliability
- Certainty of Service
- 24/7 monitoring for consistent, uninterrupted service
- Addressing the Needs of Different Customer Sets





# Coverage Across Your Campus, Including Inside all Residential Units

As you go about your day, smartphone or tablet in hand, you likely expect wireless service wherever you go. After all, your favorite coffee shop has it, airports and hotels have it, office buildings have it, and even public buses now offer Wi-Fi. But what about your Senior Living Community?





# Coverage Across Your Campus, Including Inside all Residential Units

Wi-Fi is now a utility (like power); it is expected – even in senior living communities. Your future residents, Baby Boomers, are retiring at the rate of 10,000 a day! They're technically savvy as are their family members, who also expect wireless services when they visit your community.

Deploying wireless Internet access across your campus will go a long way towards resident satisfaction and significantly improve their loved ones appreciation of the services being delivered., It will differentiate your facility, make your employees' jobs easier and facilitate a number of operational improvements. However, one size doesn't fit all – and CCRCs have unique long-term considerations that can only be addressed via a Medical Grade Wi-Fi<sup>®</sup> solution.





# Coverage Across Your Campus, Including Inside all Residential Units

A consumer-grade wireless network might provide just 75% – 85% coverage while an enterprise-grade network would be engineered to provide 95% coverage. These percentages are typically fine for consumers and businesses, but unacceptable in a clinical setting. Areas not covered properly will cause buffering and interruptions, and will drive increasing frustration levels.

Medical Grade Wi-Fi<sup>®</sup> provides 100% coverage – guaranteed.





# Signal Strength

Signal strength is prioritized at -67dBm in an enterprise-grade network (the minimum for Voice over Wi-Fi) and may be nominal or best effort at the consumer level with a -68 to -70 dBm. Signal strength in a Medical Grade Wi-Fi<sup>®</sup> network is engineered and guaranteed at -65dBm or greater (that may not sound like much, but it is a 56% stronger signal over enterprise and is twice as strong over consumer level). (Note: These are negative dBm values, so the lower the number, the stronger the signal strength.) Without a strong enough Wi-Fi signal, your device will lose connection to your network or the Internet.

This is driven by the capability of the devices that support the main (business-critical) applications. For example, laptops tend to work well even at received signal levels of -70dBm; while most Tablets work best at a minimum received signal strength of -65dBm.

Since many medical applications in a clinical setting run on tablet computers and data shows that tablets account for approximately 20% of the data consumption in a Senior Living community, a consistent minimum received signal strength (RSSI) of -65dBm would be needed for an optimal user experience.





# **Capacity/Speed**

Capacity refers to the available number of devices in range of a Wi-Fi access point. Priority in a medical-grade environment is engineered and guaranteed per unit area to ensure access by your designated vital devices. This is not the case in lesser, non-medical-grade system environments which means that each client device will be competing for bandwidth and not delivering to your expectations.

Speed refers to the throughput or data rate of each device connected to the Network. The capable speed can vary depending on protocol (802.11/b/g/n/ac/ax), while the required speed can vary depending upon the application being run. Speed can also be significantly affected by the number of SSIDs incorporated as well as experience significant degradation through the use of repeaters or mesh network devices.







# **Capacity/Speed**

To ensure that the Capacity/Speed experience is satisfactory, Medical Grade Wi-Fi<sup>®</sup> factors the number of devices expected to be used in a particular coverage area, the speed capability of those devices (802.11b/g/n/ac/ax, 2.4GHz, 5GHz) and the type of applications that are expected to be run on those devices; e.g. Netflix, Facetime, Telehealth, or email.







# **Security of Data and Communications**

If your facility deals with Protected Health Information in any capacity, HIPAA requires you to protect it. PHI comes in many forms, including electronic PHI (ePHI). Generally speaking, health data containing individually identifiable information that is transmitted or maintained electronically or in any form, including paper and oral communications, should be considered PHI and protected accordingly. Not only are the Medical Grade Wi-Fi<sup>®</sup> solutions HIPAA-compliant, no other grade of Wi-Fi offers a higher level of commercial privacy and security.

Comprehensive HIPAA-compliant physical, over-the-air, and digital security measures are built into Medical Grade Wi-Fi<sup>®</sup> networks, ensuring the highest level of security available. We can also provide Military Grade FIPS 140-2 and SIPRnet certified equipment to meet the highest levels of security. While this may not be a requirement today for Medical Grade Wi-Fi<sup>®</sup>, it may only be one major cyber-attack away from becoming a marketing imperative for CCRCs.





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# **Redundancy/Reliability**

Networks with a 98% reliability rating, are highly reliable, but what about that other 2%? In a clinical setting, you can't risk even 1% downtime. Medical Grade Wi-Fi<sup>®</sup> networks achieve higher levels of reliability, by ensuring overlapping coverage by highly available devices (typically 99% or better). A Medical Grade Wi-Fi<sup>®</sup> platform is designed to ensure that all client devices can be "seen" by at least two (2) radios.

This results in a System Availability of greater than 99.9%.

Every 1% is an extra 87.6 hours of possible network downtime in a year.





# **Certainty of Service**

Certainty refers to the ability of various grades of equipment or service protocols to operate in the area's RF environment. Certainty varies widely in a consumer setting and is prioritized in an enterprise network. In a Medical Grade Wi-Fi<sup>®</sup> network, certainty is rated "very high" for all applications and devices, particularly those that are mission and life critical.

The table below breaks out the differences as they relate to these protocols:

Medical	Life-critical, clinical patient care devices like wireless medical monitoring and telemetry systems, infusion pumps and future technologies such as MBAN (Mobile Body Area Network) devices and diagnostics
Enterprise	Physician and nurse-deployed work stations, smart phones and tablets for secure wireless access to electronic health records, nurse call systems, asset management and first-responder communications
Consumer	Shared guest Internet access for consumer devices like cellular phones, tablets and laptop computers



# 24/7 Monitoring for Consistent, Service Assurance

Additionally, the Medical Grade Wi-Fi<sup>®</sup> goes beyond being highly secure and fail safe with no single point of failure. Self-monitoring and alert mechanisms ensure that alerts are sent at every failure, and rules-based alerts can be set up. Routine device "pinging" ensures that devices are functioning properly, and if they are not functioning as expected, and alert is sent to the support team who can then take corrective measures right away to avoid failures during critical periods.

The 24/7 monitoring also provides the possibility to predict and avert potential issues, based on previous trends and system behavior. For example, knowing that an iOS update is coming and that the Network experiences congestion when this occurs gives the option of utilizing Mobile Device Management (MDM)

#### to manage how, or when the updates occur on the Network.





# Addressing the Need of Different Customer Sets

While Medical Grade Wi-Fi<sup>®</sup> ensures coverage, signal strength, capacity, security, certainty, and reliability, it also addresses the needs of a broad set of users: employees, medical staff, residents, and guests. The ability to create segmented virtual local area networks (VLANs) for each customer set increases security and operational flexibility. Traffic from your residents or their guests, for example, is completely separate from that of your general administrative staff, which would also be separate from that of your medical staff and other mission critical information flows across your campus.









# Addressing the Need of Different Customer Sets

Because each customer set uses the network differently, the service requirements vary for each VLAN. For example:

**Guest access** – Guests can include everyone from family "members, patients, and vendors to visiting doctors and nurses, ombudsmen and licensing authorities, sales professionals, and first responders. Wireless services for guests provide access to public information and generally provide coverage in lobbies and common areas. For example, your guests would be able to check their email, visit websites, and access their own cloud-based tools, but they won't have access to your business and medical networks, applications, storage systems, communications system, or network devices. Potential impacts of not providing guest access or of a network failure include guest dissatisfaction and the

### perception that your facility is "behind the times."

**Resident access** – You may want to provide residents with more robust services than guests receive, such as voice and television. Again, wireless services for your residents would be delivered over a separate virtual LAN, ensuring the integrity of your business and medical networks. Examples of how residents may use these services include: video chatting with their loved ones, checking email, browsing websites, installing webcams that their loved



ones can use to check in on them remotely, video games for visiting grandchildren, watching movies, or connecting to smart living devices like wireless thermostats and LED lights.



## **Addressing the Need of Different Customer Sets**

Residential access will have higher performance requirements than guest access because the residential network will need to support voice and video services. Failing to provide residential wireless access, or providing unreliable service, could lead to guest and family dissatisfaction along with the perception that the facility is not keeping up with technology. In contrast, providing robust wireless network services could greatly enhance your residents' quality of life and may even allow them to live independently longer. It will also attract retiring Baby Boomers who will be looking for robust Wi-Fi without the hassle of dealing with cable or telephone companies.





# Addressing the Need of Different Customer Sets

Some residents are also actively running businesses from their homes that require high capacity, secure Wi-Fi networks. This now becomes a competitive advantage in attracting this much sought after demographic.

**Business administration** – Wireless services to support business operations must be highly reliable with ubiquitous coverage and various levels of capacity. Your business network will need to deliver wired-like performance and be capable of multiple levels and segmentation. Security and privacy are of utmost concern and strong protective measures must be in place across the board to ensure both. Potential impacts of a business network failure include: business disruption; frustrated employees; impaired resident services; security breaches; and financial costs.

**Medical administration** – If your facility offers medical and nursing services, medication management, or if you interact with Protected Health Information (PHI), wireless services supporting patient care, medical services, or PHI of any kind should be medical grade and HIPAA compliant with ubiquitous coverage across the facility and strong data security. Your Wi-Fi network must also be completely independent of any other networks on campus, with its own dedicated components, services, applications, and peripherals. Potential impacts of a medical network failure



include: degradation of patient care such as treatment delays or, worse, death; costly civil actions; revocation of medical certificates; HIPAA violations; financial costs; and a hit to your reputation.





# Addressing the Need of Different Customer Sets

Because CCRCs serve several customer sets and have medical network requirements, we highly recommend designing and deploying a next-generation Medical Grade Wi-Fi<sup>®</sup> solution across the entire campus. Built on a fiber optic backbone, nextgeneration wireless networks are compliant with all current standards -- and the next two wireless standards that are on the horizon.







# Conclusion

By providing a platform which allows the implementation of digital technology for residents and families you are enabling a greater quality of life. It is all about connections and engagement; bringing people together and enabling them to communicate with others. Today's senior living residents are more adept than ever with technology innovations that improve their quality of life. That means senior living providers must seriously research wireless network alternatives and select a Wi-Fi system architecture that ensures a positive experience for their residents, their family and their caregivers.

Creating a 21st century senior living experience that incorporates new technological strategies is a significant driver towards what will draw in new residents. Not having supportive technology has been shown to drive prospects towards your competitors. Providers who adopt the right technology innovations now will be better prepared to compete for the increasingly techsavvy residents they'll serve in the coming decades.

Stay tuned for Volume 3 of our *Implementing a Robust Wireless Network for Senior Living Series* to learn all the details of *How* to go about implementing this system.





# **About Us**

**HealthSignals** provides your residents, business office, medical staff, and operations personnel with complete white glove service for our Wi-Fi, Cellular Boost, and VoIP solutions across your entire campus.

Our services include Design, Engineering, Implementation and ongoing Management of the technology solutions for our customers.

Our custom designs for your campus enable us to offer a <u>written</u> <u>performance guarantee</u>. After your acceptance of the network that we have designed, deployed and tested, any cost for additional work or equipment needed to ensure adequate Wi-Fi coverage\* is borne by HealthSignals and not you.

\*as long as the additional work or equipment required is not due to new construction or change in the building structure (e.g., new walls, eglass windows/door, architectural water additions, etc.)

