ENHANCING THE HEALTHCARE EXPERIENCE WITH **NEXT-GENERATION WIRELESS**

"This Wi-Fi is terrible." It's a complaint commonly heard in offices, coffee shops, and family rooms across America. And the grumbling has unfortunately become a part of the healthcare experience as well.

Wi-Fi can be extremely tricky in healthcare," said Matt Roberts, Healthcare Practice Leader at Juniper Networks. "As users and devices hop on and off the network throughout the day in physically challenging environments, the performance and experience can be severely impacted." While it's frustrating to wrestle with Wi-Fi in any setting, it's especially disconcerting in healthcare environments where networks are increasingly used to support a variety of medical devices, internet of things (IoT) technologies, hardware, operating systems, and mobile applications.

"In healthcare, poor Wi-Fi can have life-threatening consequences as clinicians and staff members are often using the connection to communicate vital information over wireless phones or reviewing important patient data in an electronic medical record that is being accessed on a tablet or a computer on wheels," Roberts noted. "In addition, patients and their guests, who often experience poor cellular connectivity in hospitals, today expect quick and easy access to social media and video streaming platforms, such as Facebook and Netflix. They want to consume and share information no matter where they are. And, if a hospital can't provide a reliable Wi-Fi connection, patients and guests are not going to have a good experience. This can actually have a negative impact on patient satisfaction scores, and that, in turn, could have a negative impact on reimbursements under some value-based models." Unfortunately, Wi-Fi quality is now an instrumental asset in today's connected hospital.

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The problem is that traditional, manual, network-centric Wi-Fi architectures lack the scale, flexibility, and end-to-end visibility required to support today's digitally driven society. In addition, Wi-Fi access points don't typically offer built-in navigation and wayfinding functionality that make it possible for clinicians and patients to easily find their way around a facility.

Traditional Wi-Fi is often unpredictable. Sometimes it works, sometimes it doesn't. The dynamics of today's modern hospital — from varying multi-level departments, to the growing number of IP-based devices — challenge the wireless performance that's available from traditional static and manual solutions. And many hospitals present challenging radio frequency (RF) environments where static or manual Wi-Fi channel or power assignments will always be suboptimal. Devices sometimes have handshaking problems when trying to get into the network. "The industry needs to move beyond traditional Wi-Fi and toward a solution that's predictable, secure, and highly intelligent. Not only does the network need to be up and running 24/7/365, it should also tell you what's happening every second of the day," Roberts said. "Healthcare organizations also are now looking to do more with Wi-Fi as opposed to just providing simple connectivity to the internet. They are seeking solutions that build trust and allow them to routinely engage with guests and patients, ultimately delivering an enhanced experience."

DELIVERING BEYOND RELIABLE WI-FI

To provide a better experience, healthcare organizations need to implement next-generation Wi-Fi networks. Mist Systems (a Juniper Networks company), for example, is an artificial intelligence (AI)-driven Wireless LAN (WLAN) that makes Wi-Fi predictable, reliable, and measurable while delivering consistent indoor location experiences to users.

BOOSTING EXPERIENCE WITH BLUETOOTH LE

While traditional indoor location solutions require an overlay deployment of battery-powered Bluetooth low-energy (LE) beacons or radio-frequency identification (RFID) infrastructure, Mist is unique in that it has integrated the Bluetooth LE capability into its Wi-Fi access points. The patented Virtual Bluetooth LE (vBLE) eliminates the need for battery-powered beacons, allowing a single infrastructure to be deployed that interoperates with mobile devices as well as third-party Bluetooth LE asset tags. "You do not have to physically put an asset tag on the device or hang a beacon on the wall or ceiling. That's the beautiful part of this solution," Roberts said.

As such, it's possible to provide anyone who has a Bluetooth-enabled device with wayfinding services. So, in addition to helping doctors and nurses quickly find patients who need attention, the Bluetooth LE makes it "possible to greet patients as soon as they walk into a

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facility and give them turn-by-turn navigation to the department that they need to be in," Roberts explained. "It's even possible to let them know that the doctor is running 15 to 20 minutes late and direct them to the gift shop or cafeteria for a free coffee. This not only helps to deliver a more personalized experience but also helps to lower costs by guiding people around the facility more efficiently." Bluetooth LE-enabled Wi-Fi networks can also interoperate with an existing Real-Time Location System (RTLS), making it possible to locate assets, such as wheelchairs, that need to be physically tracked with an asset tag or beacon.

By integrating Bluetooth LE, IoT and Wi-Fi together, new applications are possible that can fuse these technologies. As an example, Orlando VA Medical Center, a Mist Systems' customer, has integrated IoT door locks with Bluetooth LE-enabled badges and tags to prevent patient elopement in their mental health facility. If a patient attempts to exit the facility unaccompanied by a doctor or nurse, the Mist access point is able to trigger the door to lock and keep the patient safe.

SUMMARY

Cloud-based, next-generation Wi-Fi networks that leverage machine learning capabilities make it possible to proactively address any issues that could result in service interruptions. "AI provides the visibility and understanding into how users are experiencing the network and makes it possible to identify Wi-Fi problems as they happen — or even before they happen — and to identify the root causes," Roberts said. For example, AI can identify if the Wi-Fi is faltering because of a connection capacity issue or a time-to-connect issue; because of a wired or a wireless problem; or because of an issue that is affecting a specific user in a group of users. In addition to pinpointing the causes, AI can provide recommendations to fix the Wi-Fi problems before they materialize.

Finally, by adopting next generation Wi-Fi, healthcare organizations will be able to automate operations instead of troubleshooting, thereby providing the connectivity patients and staff members want — as well as the unique experiences that enable improved satisfaction.