CHAPTER 1

NETWORK CONVERGENCE EMPOWERS THE INTERNET OF THINGS

As the number of connected IoT devices looks set to exceed 40 billion by 2025, enterprises in every industry stand to harness and extract value from the zettabytes of data that will be generated. R&D investments of organizations in the developed and well-established economies of North America have promoted digitization and adoption of smart connected devices in Smart City initiatives. Demand for robust connectivity will increase, as will impact on network infrastructure. Leading hubs of IoT development have sprouted across North America, impacting industries such as transportation, manufacturing, agriculture, government, healthcare, and retail.

IoT sensors will generate intelligent data to drive new analytics and services. Over the next five years, the expanding edge computing environment featuring greater processing power, storage and other advanced capabilities will establish robust communications back to centralized services.

Multi-access edge computing deployments are moving processing power to the end-points to enable lower-latency applications. Simultaneously, wireless networks using both licensed (4G/5G) and unlicensed (e.g., Wi-Fi, Bluetooth, LoRa, Zigbee) spectrum find themselves co-located. For example, smart buildings are already being served by reliable cellular coverage along with ubiquitous Wi-Fi and support for IoT wireless net-works. With CBRS-based private cellular networking added to the mix, even more networks will be converged under one roof in the future.

These trends rely on the convergence of broadband fiber, copper and wireless as well as powered connectivity onto a network that connects data or processing sources, and business, industrial and consumer endpoints.

THE EFFICIENCY MANDATE

Mobile network architecture is evolving and creating more capacity with 4G/LTE densification and 5G. The deployment of small cells with 250-meter spacing between outdoor cells means more bandwidth per square meter while the promise of fixed wireless 5G in the sub-6 GHz range and millimeter wave band (i.e. 28 GHz) creates still more bandwidth per unit area.

In tandem with this evolution, the converged network that IoT devices rely

on must yield efficiencies not possible with standalone networks if the benefits of IoT solutions are to be fully realized.

POWER

Developments in Power over Ethernet (PoE) technology will see a convergence between power and bandwidth delivery. IEEE 802.3bt – the 4-pair PoE standard also known as 4PPoE – increases the highest average power at the Power Sourcing Equipment output to about 90W without compromising data bandwidth.

4PPoE can power a wide range of devices – lighting, Wi-Fi routers and access points (APs), IP cameras and industrial sensors; and even enterprise small cells, retail point-of-sale terminals and digital signage systems. Grand

View Research predicts that the global PoE market will reach US$3.77 billion by 2025 as more applications and devices utilizing 4PPoE technology, which is compatible with data rates of up to 10GBASE-T, are introduced.

FUTURE-PROOFED

Whether it's laying the groundwork for wireless and wired infrastructure, for data analytics, or for cabling within a building, decisions are being made today for sites that are going to be around for another 20 years. As such, organizations need to prepare now to take advantage of technology trends such as the IoT, 5G, Multi-access Edge Computing (MEC), and new standards in PoE.

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SUCCESS STORY: THE ROYAL PARK HOTEL, MICHIGAN, U.S.A

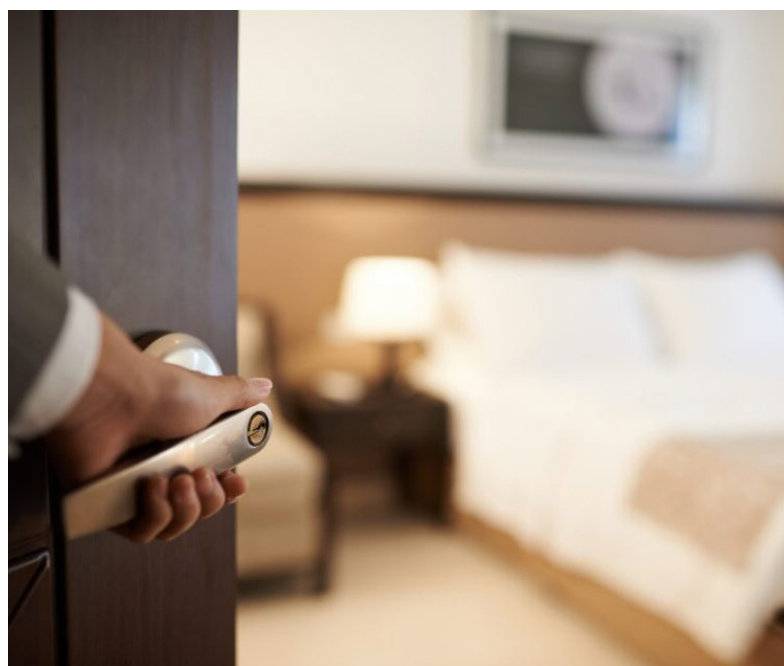# STRATEGIC IOT APPROACH LAYS FOUNDATION FOR FUTURE INNOVATION

The IoT offers the hospitality industry an opportunity to continually innovate and en-hance guest satisfaction. Building on its delivery of award-winning guest experience, the luxurious Royal Park Hotel in Rochester, Michigan aims to further raise the bar on convenience and safety via the use of IoT.

The hotel required a cohesive and strategic approach to integrating IoT capabilities. Specifically, it planned to replace standalone door locks with an online door lock system for added security and guest convenience while avoiding the cost and complexity of an overlay network to support the connected locks.

ASSA ABLOY Global Solutions and RUCKUS collaborated on an integrated solution to bring the door locks and future IoT technologies online.

SOLUTION

Both organizations agreed that connecting the online door locks through the RUCKUS IoT Suite over the RUCKUS Wi-Fi was a better approach than having an overlay network, which typically requires additional cabling, switches and gateways for each IoT device. That would drive up cost and complexity.

The joint integration includes the RUCKUS IoT Suite and Visionline wireless locking system by ASSA ABLOY Global Solutions along with its wireless Zigbee door locks.

Each door lock is now an IoT endpoint on the network. It transmits and receives information to an IoT-enabled AP, which connects to the RUCKUS IoT controller. The IoT controller manages and controls the APs, and it connects to the Visionline server, which manages the connected entry system.

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BENEFITS

Authorized hotel staff can view the status of every guest room door instantaneously from a single dashboard and be alerted to anomalies that might indicate problems or potential security concerns. The hotel can create automated policy-based actions like deactivating a keycard after several unsuccessful access attempts.

Guests not only enjoy added security but also added conveniences like check-in via mobile device, soft key download to smart phone, and stay extension or room change without requiring new keycards.

The RUCKUS IoT Suite leverages the cabling, switches and IoT-ready APs to create a converged IoT network – supporting Bluetooth Low Energy and Zigbee standards – at a fraction of the cost of overlay IoT networks.

Importantly, it paves the way for other possibilities, including wearable panic buttons for workplace safety, and asset tracking to keep track of things like room service trays. These capabilities enhance safety and productivity for staff as well as convenience and security for guests.