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## OVERVIEW

It's easy to lose perspective on just how much technology has shaped the travel and hospitality industry. In 2009, the first hotel and airline apps were just hitting the market. Instagram and iPads didn't exist. Most travelers scoured newspapers and magazines for vacation rentals. Taxis were hailed by hand, and small luxury hotels were among the only businesses that could even attempt to create a personalized experience for guests.

Skip forward ten years and the world of hospitality and travel is very different. Travelers expect a "better than home" experience and are willing to pay for it. This opens the door to opportunity for operators to differentiate themselves and create an even deeper relationship and loyalty between their brand and customers. The all-important question of course is how this is done.

Guest Wi-Fi, while still one of the top criteria for guests, has become an expected amenity. But as any good hotelier can tell you, the way to truly delight guests is with the unexpected. How much better if this can also materially contribute to the bottom line of day-to-day operations.

IoT networks and devices have emerged as a problem-solving tool for hospitality operators as well as a way to differentiate and delight customers with a better than home experience. IoT devices can track assets, employees, and connect environmental controls back to a central control point at a given facility. IoT can also be used to provide better experiences such as better, and faster, room pick up services and door locks that can be operated with the guest's phone instead of a clunky key card.

IoT has been both a blessing and a complication in that each IoT device requires a separate hub to provide network access. These devices are managed by a myriad of separate vendor specific management suites that operate as standalone silos. The Ruckus IoT Suite, combined with SmartZone controllers and Ruckus IoT ready access points, and Ruckus ICX switches provide a centralized and secure system for not only network access but management of IoT devices.

## GUEST SAFETY

With an estimated 187,000 hotels and 17.5 million guest rooms, the demand for IoT as a means of enhancing guest safety has exploded. Hotels have an affirmative duty to exercise reasonable care for the safety and security of their patrons. Therefore, they must protect their guests and employees from foreseeable criminal acts of third parties. In most cases, a greater burden of protection is placed upon hotels than upon landlords and other business owners. However, the law in this area varies greatly from state to state. Most local governments hold that hotels are not liable for third-party crimes unless at fault (negligent) in reasonably protecting guests from foreseeable harm. For example, numerous court decisions nationwide have found hotels liable for failing to provide adequate locks on doors and windows. Secure door and entrance environments are increasingly being developed into total concepts for buildings in conjunction with IT and sustainability requirements. The Ruckus IoT Suite combined with IoT door locks allows for a secure, simplified management of Zigbee and BLE IoT guest security devices.



- Mobile access and Identification technology- allows for mobile credentials to be automatically delivered to guests' mobile device,
- Entrance automation- allows access for guests straight to their rooms and improving efficiency at the front desk.



## STAFF SAFETY

Staff safety and tracking have become industry requirements for all hospitality operators. The ability provide quick access to help for staff in case of an emergency is paramount in any staff safety IoT deployment. The Ruckus IoT Suite combined with IoT location bracelets and tags provides a secure and manageable staff safety solution that provides actionable data when it is needed most.

Combined with IoT partners the Ruckus IoT Suite can provide:

- Real-time alerts when staff trigger for help
- Staff locations before and after an alert is triggered
- A hospitality-focused platform to protect your staff and provide a safer work environment
- False alarm and safety call tracking to provide reports on work environment in order to optimize security



“It’s an excellent idea. Tremendous idea that they carry an alert device that they can keep with them and it should alert a central station. ... It should have a GPS device to register the location on premises.” said Ron Williams, owner of Talon Executive Services, a personal protection company.

“You can never underestimate the importance of empowering employees to take appropriate steps where they feel their personal safety is at risk or they are offended by statement”, said Chuck Conine, president of Hospitality HR Solutions.

## FACILITIES

Guest-room automation provides a way for hotels to differentiate by keeping up with smart home technology to make the guest feel comfortable and feel the accommodations are tailored especially for their needs. For example, hotels and resorts utilize IoT to save energy and increase indoor lighting consistency by automatically adjusting the LED lighting based on the natural light detected coming into the room. A better than home experience.

IoT-enabled sensors also allows facility executives to tackle energy consumption that has historically been difficult to measure. In office environments, computers and monitors, smartphones, vending machines, and even coffee makers are growing in plug and process load (PPL) energy usage. While much attention has been paid to HVAC and lighting, PPL energy usage is beginning to attract more attention as the technology allows facility managers to hone in on it.

Advanced power strips, load shedding devices, and occupancy sensors allow for remote and automated measurement and control. Facility managers can now collect data on PPL energy usage and can even zero in on specific areas of the office. Based on the insights gathered from that data, they can take steps to reduce consumption and directly boost bottom-line profit. One of those steps is to monitor and manage PCs remotely, setting automation protocols that change their power settings when not in use. Advanced power strips can sense when a workstation has become inactive and power down the equipment at that station, allowing facility managers to capture every bit of energy savings they can.

While safety for guests and staff is important, the day-to-day running of a facility is also critical. Staff entrances, security systems, and cameras are some of the many things that are now being controlled through IoT technology. The Ruckus IoT Suite, combined with Ruckus SmartZone and IoT partners, provides a best-in-class system that integrates with the property's PMS systems for complete control and visibility. This provides a single infrastructure for facilities managers to monitor and control the day to day needs of their site.

- Electromechanical locking-providing high pressure and weight bearing exterior locks for facility security.
- Access control-scheduling entrance locking time and authorization of certain keys for different areas of a facility.
- Entrance automation- remotely programming and auditing your entire hotel from a centralized terminal.
- Security doors-secure lock solutions for interior facilities management areas as well as external service entrances.
- Hotel security-wired and wireless security cameras transported across a single network.
- Environmental monitoring-temperature, humidity, and chemical sensors attached to the IoT network for facilities management.



## ASSET TRACKING

One of the easiest ways to keep customers coming back is by providing an enjoyable and memorable experience. The more satisfied a guest is with their stay at hotel, the more likely they are to choose that establishment over a competitor for future accommodation needs. Traditional ways of achieving customer satisfaction and attachment have included loyalty programs and exemplary customer service. Asset tracking can contribute to the overall experience as well through increased guest satisfaction and a personalized, better than home experience.



Room service is a popular example of how room pickups for food trays, shoe shine and laundry services add to the overall guest experience. While these amenities are expected, guests prefer to be able to utilize the services without picking up a phone or requesting a room visit via their connected devices. Through location tracking, hospitality operators can delight their guests by knowing what the customer needs almost before they ask. When a room service tray or shoe shine bag equipped with an IoT tracking tag leaves a guest room, hotel staff can be instantly notified that service is needed and exactly where.

This kind of actionable business knowledge can benefit hotel operations efficiency as well as guest satisfaction. Instead of a hotel employee walking each hallway intermittently to check the status of each floor for room service trays, shoe shine bags, etc. they can be dispatched exactly when needed. This increases the availability of limited resources for other functions required to run the property. With the Ruckus IoT Suite and our IoT partners, we can track any desired asset in the facility, from the time it is placed in the hallway for pickup to the time it is re-delivered to the guest room.

- Room service trays-IoT tags will notify staff when the tray has been placed in the hallway and report the location of that tray for easy retrieval.
- Laundry pickup bags-IoT tags notify staff 24/7 when a laundry bag is placed on the door for pickup.
- Luggage carts-IoT tags track the whereabouts of luggage carts for easy retrieval by staff.
- Shoe Shine bags-IoT tags notify staff when a shoe shine service bag has been hung on the door and track the location of the bag throughout the guest request.
- Facility tool kits-IoT tags provide real time location for assets like tool kits, fire extinguishers and many other facility management assets for ease of location and inventory management.



## RUCKUS IOT SUITE

The Ruckus IoT Suite enables operators to manage and view their IoT deployments from a single point. Ruckus IoT ready APs eliminate the need for installation of vendor specific IoT bridges by using the access points to transport the beacon information to the Ruckus IoT controller and on to the specific IoT partner's services engine, on or off site. When leveraged with Ruckus's API integration, this allows seamless management and integration of multiple IoT partner's devices and services on to a single platform.

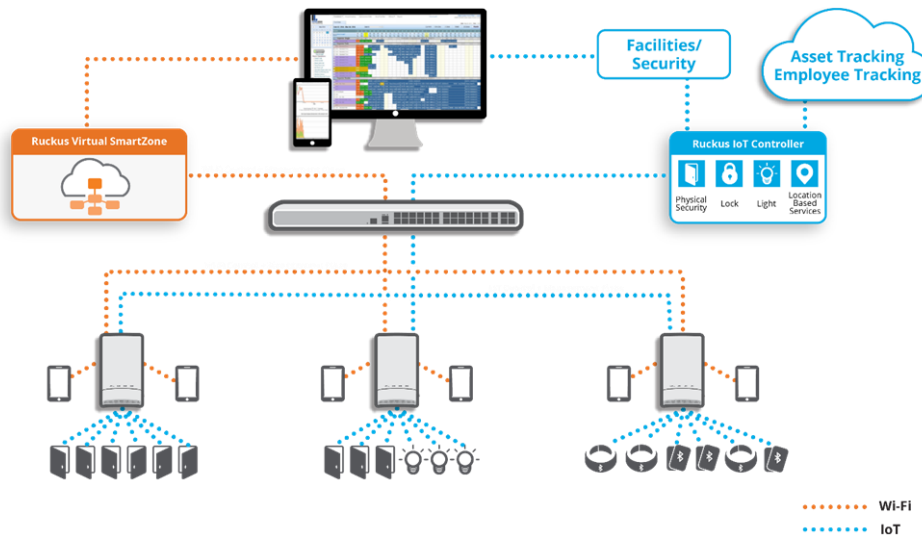


Figure 1: Example topology with Ruckus IoT Suite

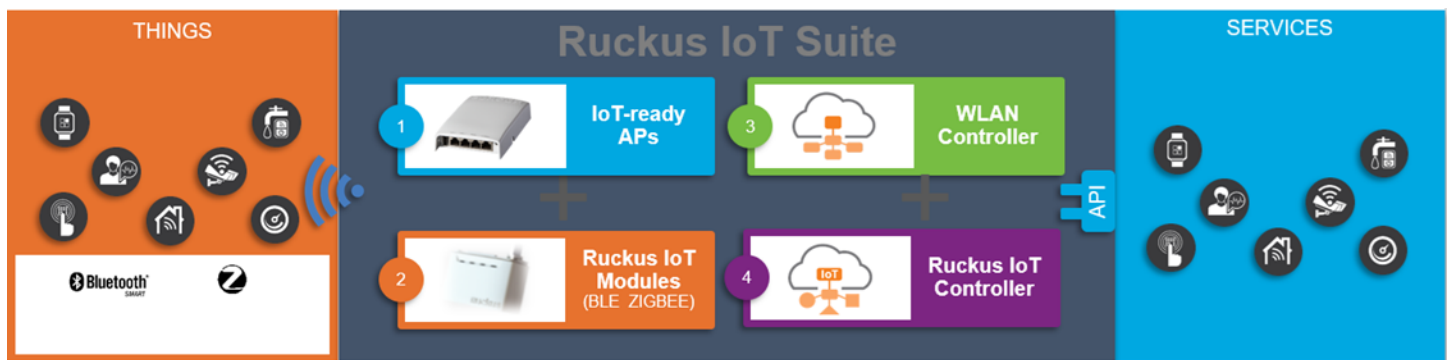
- **Beacons and Tags Collect:**
  - location data,
  - sensor data
  - event data (triggered with a press of a button)
- **Access Point**
  - Collects Beacons Data Using BLE Interface
  - IP'fies using MQTT protocol, send data to MQTT Broker (IoT Controller)
  - Provides Secure Transport, MQTT(s)
- **IoT Controller**
  - Aggregates MQTT data from Access Points
  - sends to Kontakt.IO Cloud API Server
  - Provide Secure Transport, HTTP(s)
- **IoT Service Platform**
  - Digital Twin Creation & Workflow Management
  - Asset Location Visibility
  - Condition Monitoring
  - Alert Engine & Incident Handling
  - Analytics Dashboard (e.g. Heatmaps, Actionable Insights) & Dynamic Reports
  - Predictive Maintenance
- **IoT Services Engine**
  - Manages Devices: Beacon & Tags (DM)
  - Collects from IoT Controller
  - Decapsulates data to extract Beacons Content



## SUMMARY

More people travel across the world today than at any other time in human history. They travel extensively, not only for work, but for pleasure as well. This increase in the amount of travel worldwide has driven a significant increase in the number of high-end or luxury accommodations. The goal of these types of properties is to provide a “better than home” experience. Hospitality operators strive to know what the customer needs before they ask. With the guest being very much in the forefront of any operator’s mind, there is also the requirement for safety for not only the guest and facility but staff as well. This, combined with facility requirements in environmental monitoring and security controls, creates a daunting balance of priorities and resources for any operator.

The Ruckus ecosystem already provides best in class Wi-Fi and switching systems in hospitality. When this is combined with the Ruckus IoT Suite and IoT ecosystem partners, Ruckus can provide a secure and manageable hospitality IoT environment with the flexibility of managing multi-vendor and multi technology IoT devices from a single Ruckus pane of glass.



There are many use cases that IoT Suite lends itself towards. Smart operators are realizing the power of IoT solves both age-old problems of guest satisfaction and loyalty as well as newer challenges arising from more tech-savvy “digital natives” the ever escalating drive to differentiate and excel.

## About Ruckus Networks

Ruckus Networks enables organizations of all sizes to deliver great connectivity experiences. Ruckus delivers secure access networks to delight users while easing the IT burden, affordably. Organizations turn to Ruckus to make their networks simpler to manage and to better meet their users' expectations. For more information, visit [www.ruckuswireless.com](http://www.ruckuswireless.com).

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## About ARRIS

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