AiRISTA FLOW

THE COMPLETE

RTLS GUIDE

Understanding Real-Time Location Systems Technology & Use

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Chapter 1

What is RTLS?

Real-Time Location Systems (RTLS) are technology solutions that automatically identify and track the location of objects or people in real time and in most cases within a building, such as a warehouse, shipping yard, hospital, or campus.

RTLS solutions allow organizations to effectively keep track of where things are, which can help them improve complex processes like inventory management. Designed to replace outdated, less efficient solutions like spreadsheets and clipboards, these systems automate tasks that were previously manual and prone to errors. In a typical implementation, wireless RTLS tags are affixed to objects or worn by people, and installed reference points receive wireless signals from these tags to determine their location. Characteristics of the signals detected by multiple reference points are compared using algorithms that place the tag relative to the reference points. Tags and fixed reference points can be transmitters, receivers, or both, and this flexibility allows for endless possible combinations.

RTLS tags can include sensors for temperature, humidity, and vibration in addition to location, which can be relayed in the radio signal. This intelligence is valuable to businesses from hospitals to hotels, and some RTLS systems supply dashboard-style data for easy remote analysis. Both internal parties and external parties, like public safety authorities, work with RTLS data to accomplish important tasks with ease.

> **The ability to know exactly where certain assets or people are located at a particular time is an important strategic advantage for a wide range of organizations**

RTLS Data Can Be:

- STORED
- ANALYZED
- AUDITED

To Help Companies Assess:

- PRODUCT & ASSET MOVEMENT
- PROCESS TIME & COMPLETION
- SERVICE DELIVERY SPEED

RTLS
Then & Now

The term “RTLS” first emerged in the late 1990s to describe and differentiate a new technology that leveraged the automatic identification capabilities of radio frequency identification (RFID) tags and provided the ability to view the location of a tagged object on a computer screen. Although similar capabilities had been used earlier by military and government agencies, the technology supporting it had been too costly for commercial purposes. Today, RTLS is a growing market. According to Gartner’s “Forecast IOT Tracking Tags by Use Case” (2019), the installed base of tags will grow at 19.9% CAGR from 2018 to 2028. Smart cities, healthcare and manufacturing are the three largest markets and will grow at 26%, 11%, and 24% respectively.

> **The market will grow at an estimated compound annual rate of**
>
> **20%**

Chapter 2

Types of RTLS Solutions

RTLS solution offerings vary based on factors like the types of tags used for tracking and the network backbone that supports the system.

Active and Passive RFID

There are two types of tags used in modern RTLS solutions: passive and active.

Passive RFID tags track the location of objects. With passive RFID, a reader and its antenna send a radio signal to a tag, which uses the energy of the transmitted signal to return a signal unique to that tag. Passive RFID systems can operate in low frequency (LF), high frequency (HF) or ultra-high frequency (UHF) radio bands. As the name suggests, passive tags are only sensed when they are interrogated or detected by a receiving device or reader. The response from the tag contains a unique ID of the tag itself. Determining the location of this tag is rudimentary; the tag's location is based on its proximity to the known location of the reader, so if and when the reader senses the tag, its location is determined to be the same as the reader's at that point in time. Passive RFID systems can serve as cost-effective solutions for tracking lower-cost items like those found in manufacturing and retail environments. Because passive RFID tags don't require a power source or transmitter and only require a tag chip and antenna, they are usually less expensive and smaller than active tags. However, they do have a shorter range, meaning they can't be read from as far away as active tags.

> **RTLS solution offerings vary based on factors like the types of tags used for tracking and the network backbone that supports the system**

Active RFID tags feature a transmitter and their own power source, usually a battery, which is used to run the microchip's circuitry and transmit signals to a reader similar to the way a cell phone sends a signal to a base station. Active RFID tags have a longer read range than passive tags, so they're more useful for applications such as tracking goods or assets that need to be scanned over longer ranges. These tags are typically powered by long-life batteries that last several years but eventually need to be replaced.

RTLS Systems Technology

Some RTLS systems like the one offered by AiRISTA Flow use active RFID technology that leverages existing Wi-Fi networks to provide real- time location visibility. This solution includes Wi-Fi tags that track and report on the movement of assets and people and the status of safety alarms and temperature sensors. These RTLS solutions use a variety of patented algorithms to calculate location. Some are based on the access point's (the receiver) perceived strength of the signal from the tag's transmitter and others compare the strength of the signal transmitted by surrounding access points as perceived by the tag (the receiver) and compares these readings against a stored database of Wi-Fi readings, or received signal strength indicators (RSSI). Leveraging any or all of the RTLS technologies—infrared, BLE, and GPS—AiRISTA Flow RTLS solutions operate on a Wi-Fi network, its signal data, and noise-canceling algorithms to calculate and display the most probable locations on a virtual map.

Infrared Technology

Some systems may use optical-based technology such as infrared (IR) - electromagnetic radiation with longer wavelengths than those of visible light- and RFID to provide location tracking. In the case of infrared RTLS, tags and badges emit infrared and RFID signals containing unique identification codes that are collectively received by sensors to determine locations.

> **RFID-over-Wi-Fi™ uses transmitted readings to calculate a number of probable locations on a virtual map**

BLE Technology

The most recent addition of Bluetooth Low Energy (BLE) to the RTLS family of technologies provides a cost- and energy-efficient alternative for close-space(generally indoor) location determination. This is a popular choice for users with infrastructure constraints, a need for high levels of accuracy, or a tight budget.

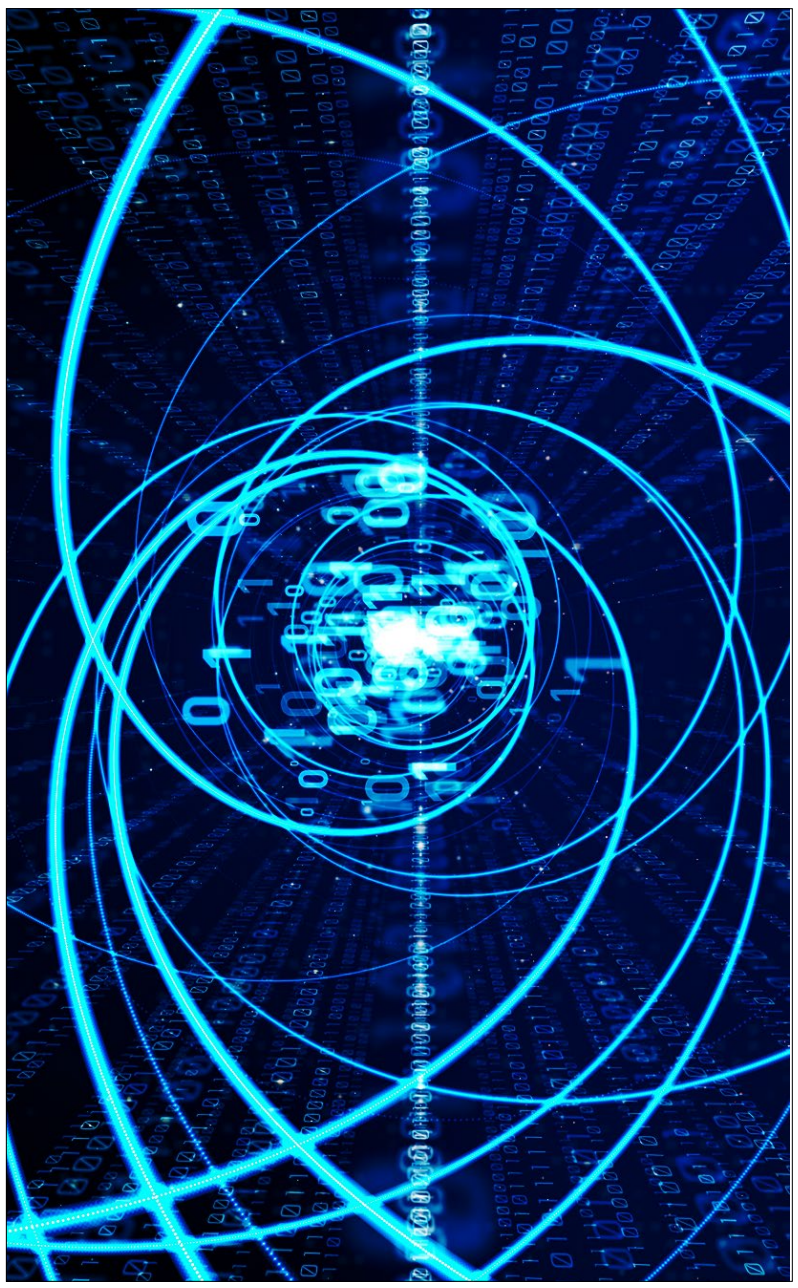
GPS Technology

Other RTLS offerings use global positioning system (GPS) technology to locate tags. GPS, commonly used by consumers in their vehicles or via their smart phones to find particular locations, is a satellite navigational system in which certain satellites continuously transmit digital radio signals that include data on their location and the exact time to the Earth-bound receivers. The satellites contain atomic clocks that are precise within a billionth of a second, and based on this data, the receivers know how long it takes for the signal to reach the receiver on Earth. By using three satellites, GPS can calculate the longitude and latitude of a receiver based on where the three spheres intersect. GPSbased Real Time Location Systems are severely degraded when used indoors because of the resistance posed when physical structures block satellite signals. They also consume significant amounts of energy, making them impractical for use in environments where tags do not receive a continuous power supply or are not charged daily.

Chapter 3

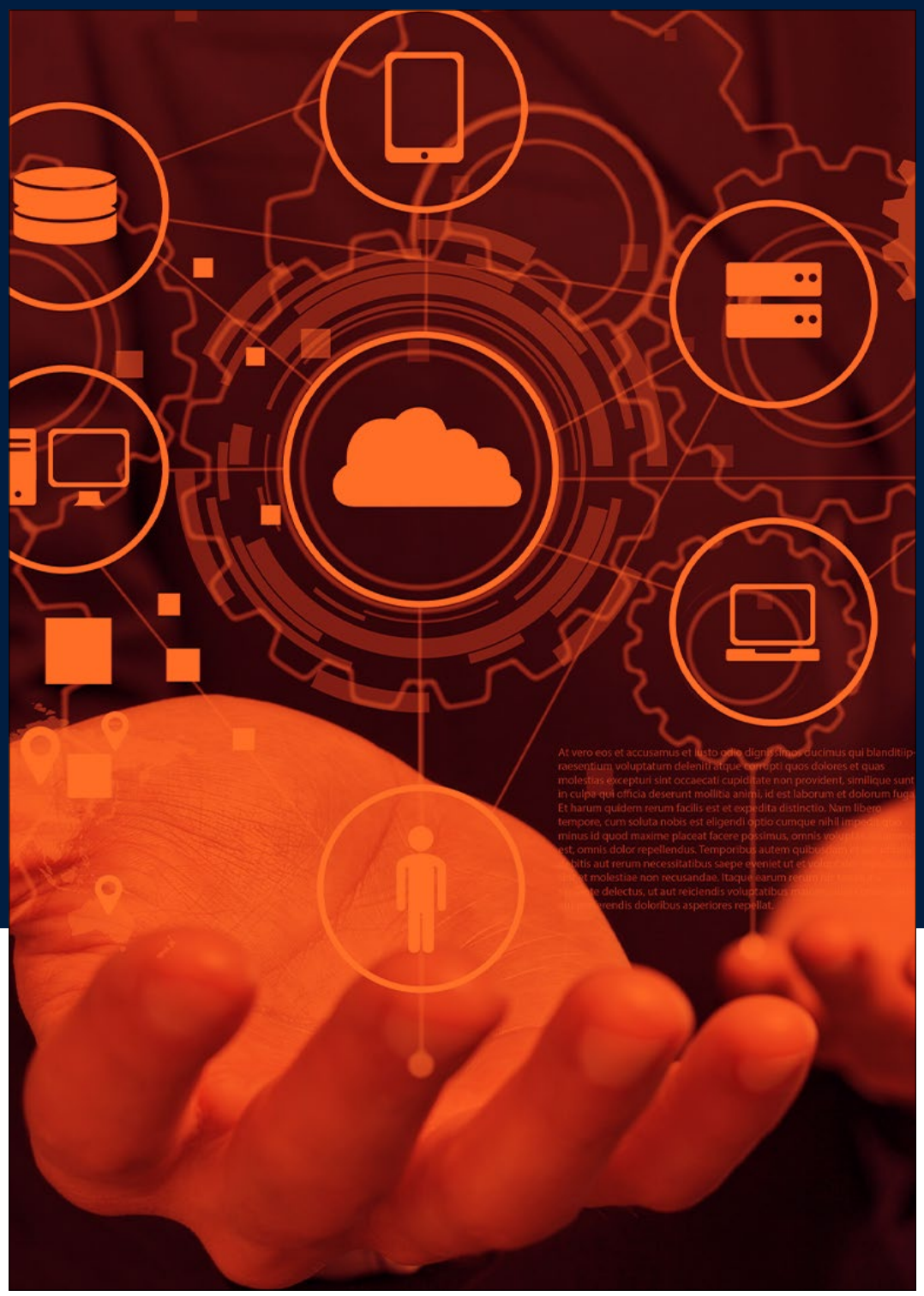
Role of Software Platform

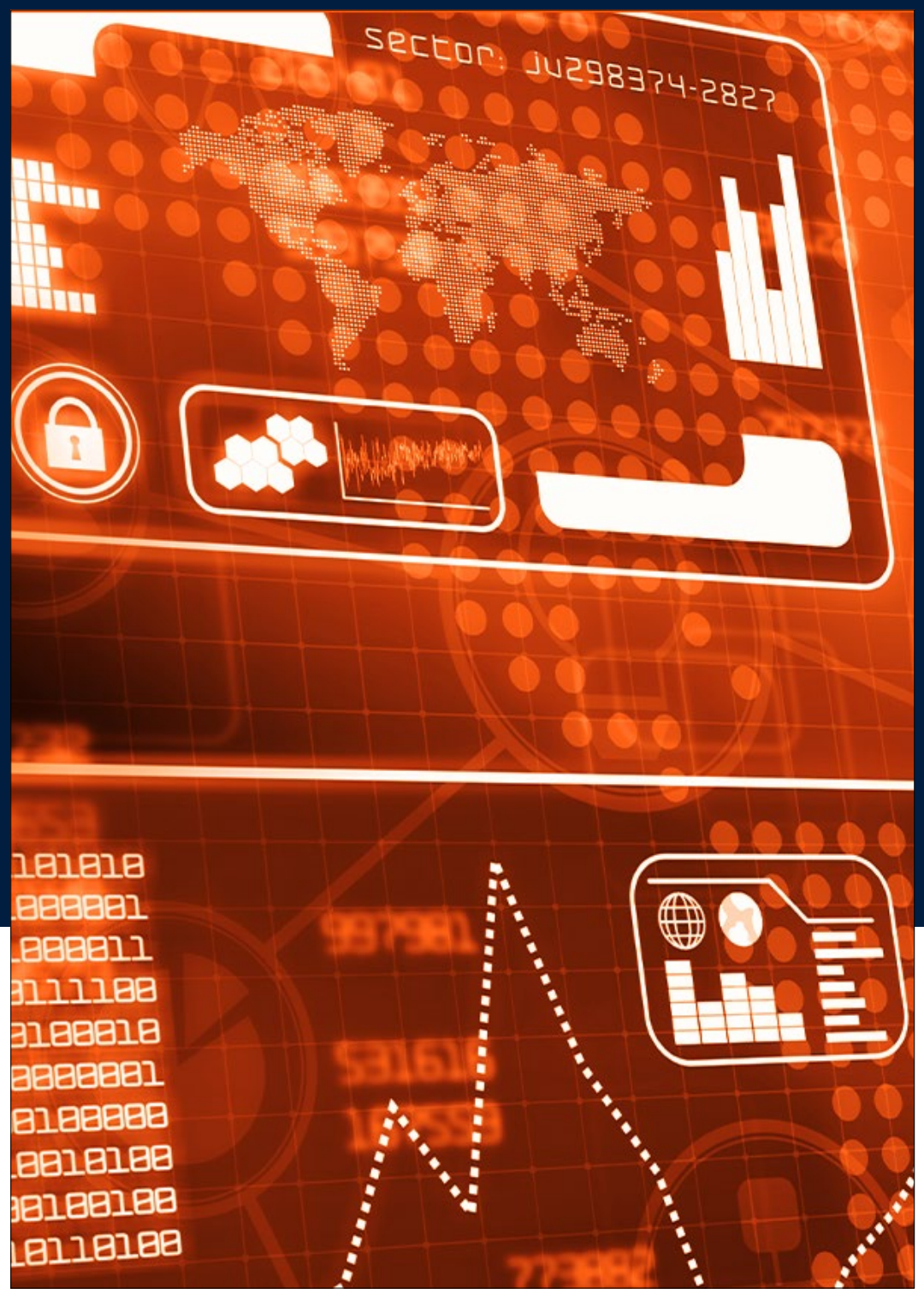
Business value does not come from location knowledge alone. At the core of RTLS solutions is a software platform that translates location information into measurable business value. The capability of the software platform should be one of the primary considerations when evaluating RTLS vendors.



Workflow Engine

At the heart of the system is a workflow engine that implements in software the processes effected by location tracking. These can be simple if-then-else type statements that might generate an alert when the temperature of a refrigerator exceeds predefined limits. AiRISTA Flow's Unified Vision Solution (UVS) platform provides a simple interface that allows a lay person create these simple types of rules. UVS also provides more sophisticated process flows as canned modules that can be customized. But many workflows need to model complex processes with multiple input sources and relations. For example, one UVS workflow responds to an employee duress situation by notifying the "nearest" responders via a text message to their tag, locking specific doors, activating alarms, triggering escalation notifications after a designated period, communicating an "all clear' notice and providing a recorded replay of the event complete with the paths taken by individual on a map of the floor plan.





Integrations

To facilitate business process, the workflow engine of the RTLS solution must integrate with devices and applications. Interfaces to relays and solenoids allow control physical devices locks and cameras. Support for popular applications APIs via web and REST interfaces drive processes requiring input from enterprise applications. In one instance, UVS grabs a vehicle's VIN number from the daily product plan and pushes the unique build instructions pulled from the Manufacturing Execution System (MES) for display on the associate's instruction screen.

Reports

The report and analytics interface is the users' window into business value. Basic canned reports will show real time location when trying to find someone or something and their historic paths taken over time. Canned reports will track quantities of items and utilization rates . AiRISTA Flow's UVS solution also offers customizable dashboards that rival expensive front ends from analytics vendors. These dashboards mash up data from multiple sources to expose multidimensional relationships.

Chapter 4

Practical Applications

Use RTLS Technology to Improve:

OPERATIONAL PROCESSES & WORKFLOWS

SAFETY & SECURITY

INVENTORY MANAGEMENT

RESOURCE EFFICIENCY

EMPLOYEE ENGAGEMENT

Manufacturing

Factory workers can use RTLS to find and deliver materials to keep production processes running smoothly, enhancing productivity through significant time savings. Real-Time Location Systems can also automate the par-level monitoring for materials and products and send alerts when WIP levels deplete, decrease, or increase beyond preset thresholds. Managing inventory with RTLS allows manufacturers to run more efficient factories and warehouses. Real-time alerts can help companies ensure equipment is properly maintained, reducing the TCO of these products.

Hospitality

At a hotel, a guest room attendant, housekeeper, or other staff member can alert security and management via a mobile "panic button" in a duress situation. This directs a rapid response to emergencies to keep employees safe when difficult or threatening situations occur on the job. Businesses in the hospitality industry use RTLS to accomplish personal safety and compliance objectives and meet everyday needs like tracking the location of luggage carriers, laundry bins, and room service carts.

Healthcare

In the healthcare sector, hospitals and clinics can use the technology to track and manage assets such as medical equipment, through real-time visibility into the location and status of the equipment.This can potentially reduce inventory costs, cut down on the time it takes nurses, technicians and other healthcare professionals to locate missing equipment, reduce theft of high-cost systems, and automate the maintenance of equipment. Healthcare facilities can also decrease the amount of time patients have to wait between procedures, through automated alerting and monitoring of patient activity or inactivity. They can also enhance the safety of patients by keeping track of their whereabouts within a facility.

> **RTLS solution implementation can help organizations in a variety of industries address specific business challenges and goals related to equipment, processes, and teams**

Education

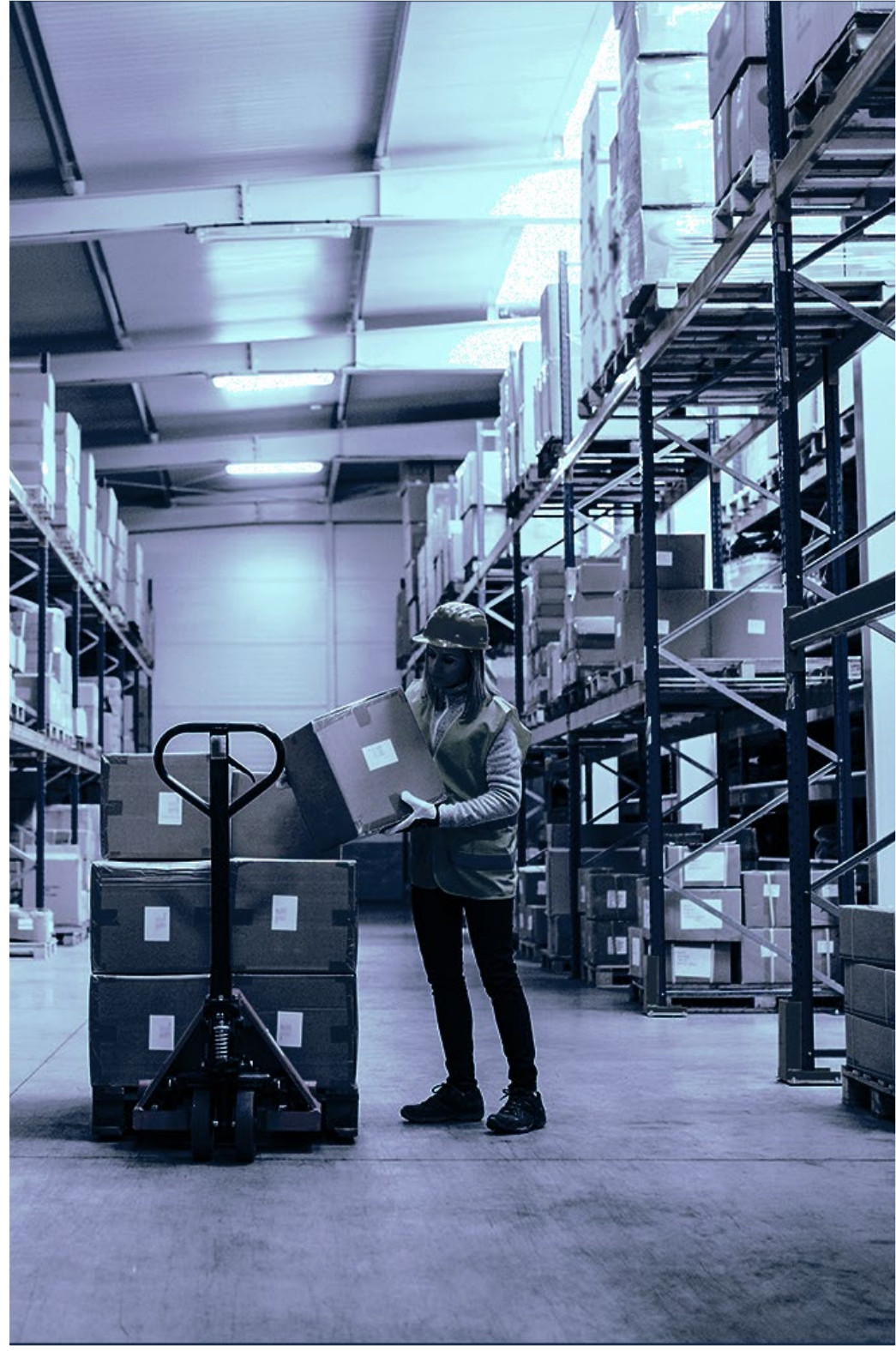
Education In the education sector, schools can use RTLS to improve the safety of students and staff and track the location of faculty and staff members within the building. With an RTLS alert system, security teams and police in an emergency situation can instantly determine the location of teachers and students wearing Wi-Fi badges.

Government & Public Safety

From tracking food supplies at the USDA to monitoring critical assets at the DHS to locating fleet vehicles at the local Department of Public Works, government organizations use RTLS to gather important data and keep the public safe, provide high-quality goods, and offer more convenience. a can use RTLS to directly communicate with injured parties via text, receive alarms when visitors enter restricted zones, and send mass notifications directing people away from a dangerous situation, without relying on cellular networks or manual dialing.

Managing Asset Inventory

Managing Asset Inventory Managing Asset Inventory Many different types of companies must manage their asset inventory effectively to keep tabs on the equipment available for use in everyday operations. In the manufacturing sector, companies can use RTLS for real-time asset tracking in facilities such as plants and warehouses. A manager can quickly locate particular containers, pallets, or production equipment on a factory or warehouse floor without needing to conduct a time-consuming manual inspection using a clipboard or spreadsheet. First-in and first-out rules can be applied to perishable inventory. Companies in the distribution market, including logistics and transportation service providers, can deploy RTLS to gain visibility of vehicles, equipment, and containers in logistics yards to ensure optimal scheduling and shipping. In the healthcare sector, hospitals and clinics use location-based solutions to help nurses, technicians, and other healthcare professionals track and manage medical equipment.



RTLS Asset Management Helps:

1. Reduce inventory costs
2. Locate missing equipment
3. Reduce theft of high-cost systems
4. Automate equipment maintenance

Chapter 5

Limitless Possibilities

MINING COMPANIES
Track workers' onsite location for safety purposes

DISTILLERIES
Monitor fermentation container temperatures to ensure optimum quality

SPORTS VENUES
Track players and officials, providing location-based statistical data

The potential applications and benefits of RTLS are endless. Many companies, some of which you may not expect to benefit from RTLS technology, use it every day to complete critical tasks. RTLS is applicable to so many applications and industries because of its ability to track the location of a variety of assets, whether people, animals, machinery, equipment, or vehicles. Knowing the exact location and condition of assets is a big benefit to businesses small and large, but the potential for this data is in their hands - and in the hands of RTLS solution providers.

FARMS
Keep track of livestock locations

THE MILITARY
Deploys RTLS systems to track personnel and equipment

RESTAURANTS & HOTELS
Locate clients or staff who need to be contacted

MUNICIPALITIES
Monitor vehicle movement patterns to alleviate traffic issues

Personal Safety & User Experience

RTLS is often used to track people to support their safety and user experiences. With security badges, people working in harsh environments like mines and remote processing plants can track their teams in emergencies. Hospital administrators follow a patient's journey through the ER, admission process, operating room, and hospital room all the way through discharge. Tracking metrics like wait times during stages in the patient journey helps administrators better address potential patient flow challenges.

Asset Conditions & Alerting

Real-Time Location Systems can track conditions through remote temperature and humidity monitoring. Industries that rely on products or materials managed in optimal conditions, such as healthcare, food processing, pharmaceuticals, and chemicals, can ensure goods are stored in the best possible conditions to protect their value, save money, reduce waste, and keep staff and end users safe. All RTLS applications can make the most of the technology's alerting capabilities. Whether indicating an asset is located in the wrong place at the wrong time, a worker is in danger, a patient requires help, or a freezer has reached a high temperature threshold, RTLS can send an immediate signal to a manager, nurse, public safety official, or other user that allows them to take action fast.

> **Extending current applications with real-time location and condition insights increases the value of the organization's IT investments**

Chapter 6

Common Configurations

RTLS configurations can vary significantly depending on the system, use case, facility, assets, and conditions. But many RTLS implementations consist of several essential components.

Beacons

The accuracy of tag locations can be enhanced with small, battery-powered location beacons that can be strategically installed in spaces like distribution warehouse corridors, hospital rooms, logistics yards, and ports. These products are typically BLE or infrared transmitters that operate wirelessly and are ideal for areas with limited Wi-Fi coverage. Beacons and locators can receive and transmit Wi-Fi signal data to and from active tags to augment and enhance the wireless infrastructure.

System Controlling Software

Signal measurements are taken from radio communications and delivered to an RTLS controller, along with information like button presses, battery information, and temperature measurements. Algorithms calculate the accurate location of tags and badges. The system controlling software can be used to produce analytical reports and in some cases, such as with AiRISTA Flow's RTLS system, two-way messaging.

Access Points

An access point (AP) is a device that enables wireless devices to connect to a wired network using Wi-Fi or related standards. With an AP, users can add devices that access the network with few or no cables. An AP usually links directly to a wired Ethernet connection and provides wireless connections using radio frequency links for other devices to use the wired connection. Most APs support the connection of multiple wireless devices and are designed to support a standard for sending and receiving data (defined by IEEE 802.11 standards). Within the context of RTLS, tags and badges communicate with standard Wi-Fi APs typically located throughout a facility using standard 802.11 communications.

Temperature & Humidity Sensors

Temperature and humidity sensors are lightweight tags that measure and communicate temperature and relative humidity levels of rooms, containers, products, and more and allow for custom high/ low threshold settings. These sensors automatically send alerts when the humidity or temperature of the monitored environment moves outside a predefined range. The system can automate the monitoring and logging of the temperature history, which is often a laborious yet mandatory task related to compliance requirements.

Tags & Badges

Tags and badges are used to provide location information to the RTLS solution. Tags are attached to the assets, equipment, or materials that require tracking, while badges are worn by people who can be tracked or use the system to trigger alerts. The strength of the RF signal delivered from lightweight tags and badges is determined by access points and relayed to RTLS software. A single implementation can support as many as thousands of tags, but most deployments start much smaller and can be scaled up as needed. Since AiRISTA Flow produces its own tags, they control the tag's firmware, which enables end-to-end control of the solution. Control of the firmware provides for custom use cases and tight control of system quality.

Chapter 7

People & Projects

Depending on the size of an implementation and the organization deploying it, an RTLS project can involve a number of key players each with unique roles.

Systems Integrators

Many organizations need to hire an outside systems integration provider to help with deployment, and representatives from this company in many cases become part of the cross-functional team. Hiring externally makes sense for larger and more complex implementations or for organizations that don't have sufficient expertise to deploy RTLS on their own. When it comes time to choose a vendor or provider, the CIO or other high-level executive should convene with the CEO, CFO, or other senior management team member to reach a sound decision. In smaller organizations, senior executives will be involved in making a choice, although in larger enterprises, this decision might take place at lower levels.

> **It's a good idea to include several end users on an RTLS installation team because they may provide valuable input on system ease of use, training needs, and other everyday challenges that can be solved with RTLS**

Building a Team

Oftentimes, companies create a cross-functional team early in the process that's responsible for developing the RTLS strategy, including product and vendor evaluations, testing and implementation, and ongoing management. This team can consist of any stakeholders within the organization, but generally includes the CIO or other high-level technology executives and representatives from senior business management, operations, security, networking, or human resources. Including end users depends on the type of organization. For a healthcare provider, it might be valuable to involve nurses or medical technicians. For schools, end users may be teachers or administrators. For warehouses, supervisors or floor workers may need to use the system daily. Managers from operations and networking generally take part in the implementation, including overseeing equipment installation and testing. The systems integrator plays a key role in this part of the project and sometimes remains on board to help with ongoing system maintenance. In some cases, governing authorities or legal advisors may also need to become involved. Labor union officials, for example, might need to set guidance or provide approvals related to protected matters of privacy.

Required Roles

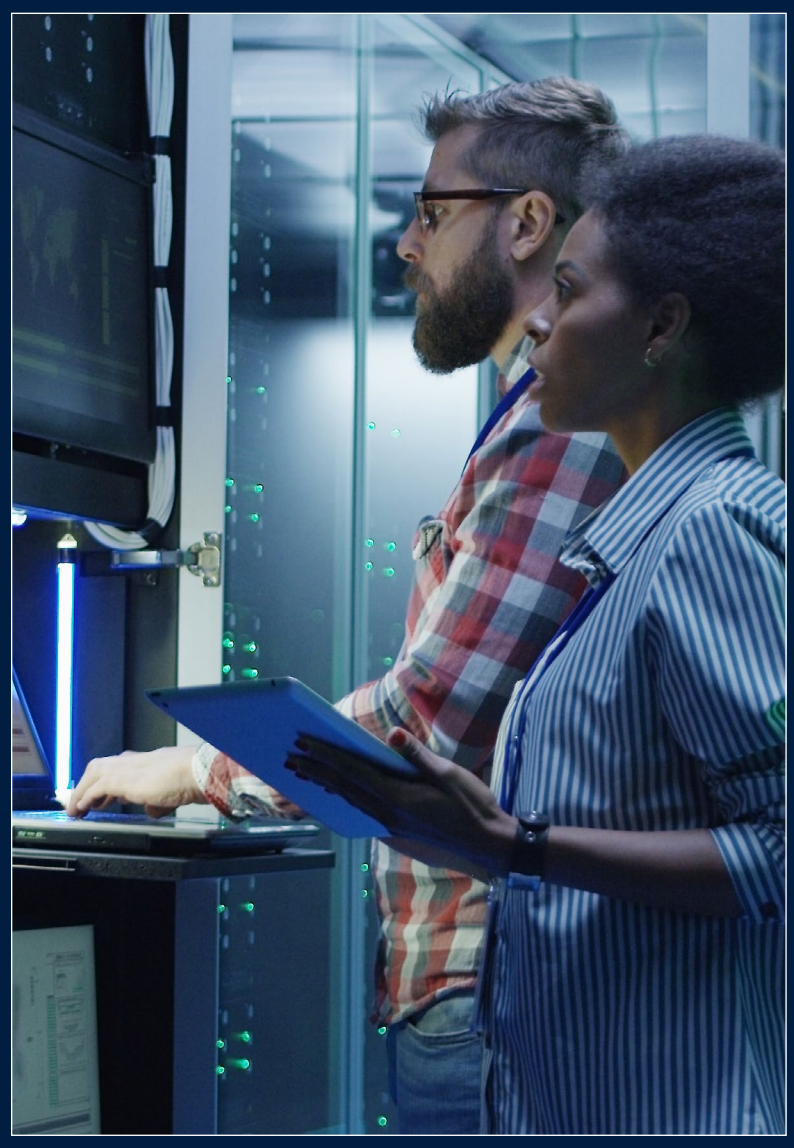
While many people are involved in an RTLS deployment project, several roles stand out as being vital to the success of the endeavor.

> **Before you begin an RTLS installation, think about who should be involved in the project and what skills, experience, and insights they can bring to the effort.**

CIO & Other Senior IT Executives

Because RTLS involves data, IT systems, and corporate networks, top IT executives in the organization should be involved, typically in a strategic oversight role to help with decisions. At smaller organizations, the CIO or IT manager might be responsible for the overall project, and at a larger company, the senior IT executive might provide strategic advice only. People in this role should be ready to consider things like:

- Will the current or future IT infrastructure support the RTLS system?
- Are there any information security precautions that need to be taken?
- How will the system integrate with elements of the IT infrastructure?
- What training will the IT staff need for deployment, configuration and ongoing management?



Department Managers

Depending on where and why RTLS is being used by an organization, system deployment and maintenance might involve heads of departments, such as inventory management, shipping and logistics, nursing, security, school administration, human resources, asset management, or product development. These managers need to be involved in the planning and implementation as well as with ongoing management and performance review. Department managers will likely be among the biggest users of the reports generated by RTLS.

Vice President of Facilities & Operations

RTLS can involve the installation of equipment throughout a facility and may impact daily operations, processes, and workflows. There might be a need to make renovations or structural changes within facilities to accommodate RTLS technological equipment, which may result in operational changes affected by deployment. Whoever oversees operations, whether it's a hospital administrator, warehouse supervisor, school principal, or other official, will need to be closely involved in project planning. People in this role should consider:

- Where equipment and tags will be placed
- How training will be provided for different types of end users
- What system uptime needs to exist
- How to get the most value out of system reports
- How strong data security needs will be met

They might also be responsible, along with IT executives, facilities, and operations and finance managers, for creating metrics to determine the ROI of deployment.

Network Managers, Administrators & Engineers

Because RTLS involves the use of existing network infrastructure like Wi-Fi, the people in charge of network operations will be involved in system planning and implementation. Issues that they need to address upfront include network configuration, security and access controls, network uptime, and how the RTLS might impact other uses of the network.

Finance Executives

RTLS, like any other technology implementation, needs to go through a budgeting process for the initial testing and implementation phases as well as for ongoing management and maintenance. Depending on the size of the organization, the CFO or another finance executive will likely be involved in various phases of the project. In particular, finance people can work with the technology and operations representatives on the project to create ways of measuring ROI, including specific KPIs that translate to hard benefits for the company.

End Users

End users are the people within the organization who will use the RTLS system on a daily basis. While end users might not be involved in configuration or management phases, they often share useful insights in the selection and testing of systems prior to implementation. End users might even be responsible for identifying the situations that require an RTLS implementation in the first place. End users might include:

- FACTORY LINE WAREHOUSE, OR PLANT WORKERS
- ASSET MANAGERS
- HEALTHCARE PROFESSIONALS
- SECURITY STAFF
- SCHOOL TEACHERS AND ADMINISTRATORS

Chapter 8

Beyond Location Information

The potential business value of the data generated by RTLS technology is enormous. In tracking the location and condition of objects, people, and environments, this technology can help companies accomplish greater goals, from saving lives and improving patient care to reducing resource waste and contributing to sustainability. With more RTLS solutions offered on compatible platforms, technology manufacturers and solution vendors are able to realize new market possibilities through the socialization of information systems.

Business Intelligence

It's important to consider and discuss the options your organization has for satisfying business intelligence goals with an RTLS provider before making decisions about purchasing and deploying systems. A sizable investment in resources and energy means you'll need to pick a solution that makes the most of your space and requirements.

But finding an RTLS solution that allows for customization will help you meet specific business needs in new ways. By integrating open application programming interfaces (APIs) into various systems and devices, organizations can create business intelligence that translates into more quickly achieved objectives. Software featuring an open API offers programming code that application developers can readily access. With an RTLS programming interface, developers can quickly integrate applications into other systems that ultimately enhance the business value of the RTLS.

RTLS plays a big role in the Internet of Things (IoT), the networking of products, assets, and other objects. Anything linked via IoT can share information through sensors and tags, enabling companies to gather information about how their products are being used, the frequency of their use, the condition of the products, and the ways products can be improved.

Platforms that are sensor agnostic can consume information from devices even without an attached tag. AiRISTA Flow embeds tag firmware in IoT devices to make the device behave and respond like a tag. Practical applications include remote asset management, energy data management, condition-based monitoring, fleet monitoring, and security. Software components in these systems allow information from various alternate information systems to pass through and create advanced connectivity for manufacturing automation and other future-focused efforts.

Open platforms and RTLS solutions with advanced software components are a natural fit for IoT. Its technology will continue to see enormous growth as wireless networking, mobile devices, and cost-effective cloud computing become more prevalent.

Chapter 9

The Future of RTLS

It's an exciting time in the RTLS market. Historically, deployments have focused on single use cases in individual departments, but advancements in wireless technology are breaking through the barriers that limited adoption. The introduction of Wi-Fi 6 and BLE 5.0/5.1 standards has created improvements in:

Location accuracy from 5–7 sq. meters to sub meter accuracy

Battery life from 2 years or less to 5–7 years or more

Cost of tags from $70+ to tags that cost less than $20

> **These breakthroughs mean many more assets will come under RTLS visibility, bringing value to the organization and increasing the ROI of RTLS deployments. New Wi-Fi and BLE standards open additional creative use cases**

BLE 5.0 & BLE 5.1

BLE 5.0 extends communication distances to several hundred meters. This opens greater use cases for tracking assets outdoors. AiRISTA Flow includes a GPS receiver together with BLE 5.0 technology in its Rugged Asset Tag. Now GPS coordinates of vehicles in parking lots or equipment in laydown yards can be backhauled over BLE, overlaid on maps, and displayed on handheld mobile devices for real-time retrieval. And the tag's accelerometer puts the GPS receiver to sleep when not in motion, extending battery life.

BLE 5.1 provides not only sub meter location accuracy but tracks location in the vertical dimension to provide true 3D location. Now inventory assets can be tracked at the shelf level. Combined with two-way communicating tags, a closed loop replenishment process can be automated to ensure the right parts are delivered to the right place at the right time.

These advances in Wi-Fi and BLE technology start to encroach on the capabilities of technologies like LoRa (low power long range) and UWB (ultra-wideband). No longer are expensive islands of niche

A Boundaryless Solution

To ensure RTLS is ready to meet this challenge, it must be boundaryless. A boundaryless software platform, like AiRISTA Flow's Unified Vision Solution (UVS), must be designed for the scale expected in an IoT world.

Modern RTLS Providers Should:

- Share best practices in a consultative approach.
- Offer workflow customization to drive process efficiency.
- Act as an extension of your IT team.
- Provide custom development for third-party integrations and analytics.
- Set retainer relationships to provide ongoing platform maintenance.
- Meet with you regularly to review your investment ROI.

technologies needed for special circumstances. The distance, accuracy, cost, and battery life of Wi-Fi and BLE allow a single wireless infrastructure to meet the needs of most use cases across the enterprise. The new assets are part of the IoT explosion, in which smart, connected devices create vast streams of information that go to waste if not harnessed.

Modern RTLS Solutions Should:

- Facilitate on-premises and cloud deployment and their hybrid models.
- Possess device agnostic interfaces to accept data from virtually any endpoint.
- Contain flexible APIs to integrate to applications that drive enterprise-wide business insight.
- Have elastic compute capability to inspect and distribute data streams from devices.
- Offer subscription to topics within data streams by enterprise resources.
- Create a centralized model of assets to form a single source of truth or digital twin.
- Maintain hierarchical data storage with in-processor memory for near instantaneous access, onboard memory designated as local memory, or data lakes for long-term storage.

To help navigate the pitfalls and opportunities of your RTLS journey, consider vendors who see the customer engagement as a continuous iterative relationship.

RTLS Terminology

Access Points (APs)

Wireless mechanisms often affixed to ceilings that use Wi-Fi or related standards to enable communication between one or more wireless devices and a wired network.

Active RFID Tags

Devices affixed to objects or people containing an internal power source that send messages with a unique identifier and location data using radio frequency to a receiver on a continuous basis or at predetermined time intervals. These work at longer ranges than passive RFID tags.

Application Programming Interfaces (APIs)

A technical platform that software developers use to manipulate code data. This term is often used in conjunction with "open APIs," which refers to code that is readily accessible between two or more software developers.

Beacons

Conspicuously placed devices that receive and send signals, data, or other information via electronic transmission. They are typically infrared transmitters that operate wirelessly and are ideal for areas with limited Wi-Fi coverage.

Bluetooth Low Energy (BLE)

A short-range, low-power communication technology operating in the 2.4 GHz frequency band that is widely compatible with mobile platforms and used in RTLS Wi-Fi tags to transfer location or status data.

Business Intelligence

Data or other information presented in a manner that facilitates decision-making with the goal of beneficially impacting an organization.

Ethernet

Technology that connects computers and supports local, and larger, wired area networks.

Global Positioning System (GPS)

Technology that leverages signals from in-orbit satellites (usually three or four) to locate objects or people in real time based on the intersection of the signals. It works well in outdoor environments with minimal signal obstruction.

High Frequency (HF)

A designation for radio frequencies (between 3 and 30 MHz) and an ideal radio frequency strength for aviation (air to ground) use.

IEEE 802.11 Standards

A widely recognized and accepted set of technical specifications for implementing wireless local area networks (WLANs) established by the Institute of

Electrical and Electronics Engineers.

Infrared (IR)
Invisible radiant energy or light with a frequency range between approximately 300 GHz and 430 THz.

Internet of Things (IoT)
A title devised to label the concept of complex interconnectivity and networking among multiple electronic products across micro and macro physical environments.

Low Frequency (LF)
A designation for radio frequencies (between 30 and 300 KHz) and an ideal radio frequency strength for outdoor and long-distance communication devices.

Panic Button
A control that when pressed sends an alert to designated authorities or sets off a silent or audible alarm, like those found on badge tags.

Passive RFID Tags
Devices affixed to objects or people, relying on power transmitted from an external receiver, that send messages containing a unique identifier and location data using radio frequency to a receiver when interrogated by the receiver to do so. They work at shorter ranges than active RFID tags.

Reader
A device that receives transmitted signals, data, or information, such as a beacon or an access point.

Radio Frequency Identification (RFID)
A technology used to classify the signal transmission, or the electromagnetic field transfer, between two or more communication devices to locate and often describe objects or people.

Real-Time Location Systems (RTLS)
Technology solutions that automatically identify and track the location of objects or people, usually indoors, at the same instance and rate of depiction.

Received Signal Strength Indicators (RSSI)
A measurement for determining a signal's power.

Systems Integrator
A person within an organization whose responsibility is to maintain one or more software applications and often associated hardware.

Tags
The physical devices affixed to objects or people that enable real-time location data to be collected.

Two-Way Text
The capability for devices to display, send, and receive messages on a digitized or LED screen.

Ultra-High Frequency (UHF)
A designation for radio frequencies (between 300 MHz and 3 GHz) and an ideal radio frequency strength for indoor communication devices.

Unique Identification Codes
Specific information describing an object or person that is contained within a device, such as a tag, and is used for locating purposes.

Virtual Map
A computerized graphical portrayal of data that is laid out to represent location contexts from received signal reading.

About AiRISTA FLOW

AiRISTA Flow is a trusted partner in workplace safety and performance as a leading global provider of location-based business solutions. We help organizations protect their employees, track valuable assets, optimize internal processes, and make informed decisions through cutting-edge software and industry workflow expertise.

Flexible Solutions

Trusted RTLS Experts

Actionable Visibility & Insights

PROVIDER OF CHOICE

MARK SANDERS

MANAGING DIRECTOR OF CROWNE PLAZA TIMES SQUARE MANHATTAN

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