WIRELESS SOLUTIONS FOR

Location Services

XIRRUS®
High Performance Wireless Networks

Wireless tracking of product, equipment, and people streamlines operations.

Location Services improves productivity and lowers cost.

Real Time Location Systems (RTLS) technology allows network administrators to identify and track the physical location of objects in real time. RTLS uses the wireless signal strength from a device to derive its approximate location using triangulation across multiple access points (APs). RTLS can read the wireless signal from built-in wireless adapters (e.g. in laptops) or from external tags attached to a device (e.g. a projector).

RTLS can provide many benefits to organizations, including:

- Saving money
- Enhancing productivity
- Improving safety
- Protecting assets
- Offering better services

RTLS has many use cases with new ones being implemented every day. Some of the more common uses are outlined below.

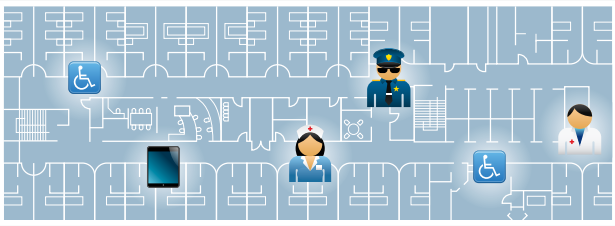
Common uses of RTLS

Locating equipment

One of the most basic functions of location tracking solutions is to identify the location of equipment for inventory management. For example, hospitals can use RTLS to keep up with portable medical equipment such as infusion pumps and nursing carts. Large hospitals have a hard time keeping track of expensive equipment because the equipment is mobile and not always in a centralized place. By using RTLS, staff can more readily find the equipment they need when they need it allowing hospitals to more efficiently use their resources and save money. RTLS is used to find missing or stolen equipment in other environments such as schools and hotels.

Network troubleshooting

One significant benefit of RTLS is for network troubleshooting. When wireless network users call into the IT help desk, there is often limited visibility into what the issue may be. With RTLS, the help desk can quickly locate the user physically and thereby gain a better understanding of the issues the user may have. For instance, the user may be in an area where wireless service is not officially provided, or in an area where there may be a lot of interference.



Example of locating equipment and resources in a hospital

Tracking personnel location

Tracking a person's location is another primary use of RTLS. One of the ways RTLS is used is to check up on employees to be sure they are at the right place at the right time. For example, an organization can use personnel tracking to be sure that security guards are properly making their rounds. Personnel tracking can also be used as a security mechanism and to help employees in need. For instance, in high-risk areas such as mental hospitals, nurses can wear tracking devices so if there is an emergency the nurse can be quickly found. The nurse can push a button on a lanyard and the RTLS will mark the location of the nurse and send help. RTLS can also be used for locating patients themselves within a hospital.

Optimizing work flow

One of the more innovative use cases of location tracking is workflow optimization. By improving efficiencies in a corporation's workflow, companies cut cost and improve revenue. For instance, the foreman of a mining company may need to schedule a specialist and equipment to perform certain tasks. By having a better understanding of where his team and equipment are, the foreman is better able to optimize his scheduling. Another example of workflow optimization is in hospitals. With RTLS, hospital administrators can actually track that the doctor goes to the sink to wash his hands first before going to operate on a patient. If the doctor is not performing his/her job correctly, hospital management can work to correct the situation to create a safer work environment.

"Location and management can also improve timely delivery of care and reduce staff time spent looking for misplaced hospital equipment. It also assists biomedical engineering staff in locating equipment for scheduling preventive maintenance, repair, and replacement." — GARTNER

Key benefits:

- Increase revenue
- Enhance productivity
- Improve employee safety

Key features:

- Track lost or missing equipment
- Offer special services to users
- Monitor Key environmental parameters

Recommended actions:

- Use multi-radio Arrays for increased accuracy
- Have at least two radios visible from any location
- Provide 100% wireless coverage in all relevant areas

Customizing customer offerings

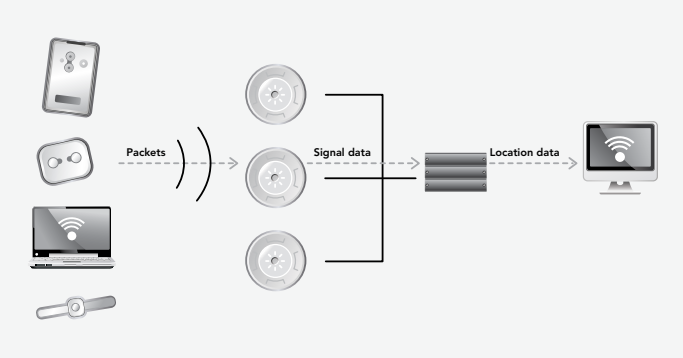
A variation of RTLS is location-based services (LBS). LBS uses the same design principles as RTLS, but LBS goes a step further by offering specific services to the user based on his location. Retail stores and restaurants are learning that they can use LBS to better entice their customers to buy more goods or services. For instance if a patron at a casino is playing poker and then gets up and walks away, the LBS system can detect this and push an offer to the patron's smartphone with a coupon for 15% off dinner to entice the patron to stay in the casino. LBS can be used by malls, stadiums, or any other public venues to offer specific services based on the location of an individual.

Environmental monitoring

Environmental monitoring uses wireless devices to check the temperature and humidity of specific regions in a building or warehouse to be sure that that region maintains specific environmental standards. With environmental monitoring systems, warehouse managers can remotely monitor inventory and get real-time updates. This monitoring can be done over wireless networks so it is much easier to install and manage the equipment. Monitoring inventory on a more granular level helps prevent spoilage, reducing wasted inventory and overall cost.

Making location services a reality

There are three key components required for RTLS to work: 1) the Wi-Fi tags and client devices being tracked; 2) the wireless network infrastructure that collects signal data from the tracked devices; and 3) the back-end software that processes the data to determine location and track it over time.



Wireless tags and client devices

Equipment and personnel can be tracked in two ways. One is to use the built-in wireless NIC card in the equipment. This is great for things such as laptops or smartphones that have a Wi-Fi NIC embedded in them. The other way is by attaching a Wi-Fi tag to the equipment. Tags come in multiple variations. Some tags can be worn as a watch, some can be worn on a lanyard, or some tags can be strapped to equipment. The Wi-Fi NICs or tags constantly send out signals, which can be then used to derive a location.

CASE STUDY — NEW COLLEGE IN SWINDON

One example of an institution that has embraced the RTLS is New College in Swindon. Swindon College has approximately 6,000 students focusing on vocational education and training. New College is one of the largest and premier colleges in the UK and one of the first to recognize the value of wireless networks and their many benefits. In fact, New College was one of the first schools to go completely wireless. Swindon uses the Xirrus Management System (XMS) Locationing Services to identify the location of laptops. The XMS helps Swindon track critical user information and troubleshoot networking issues.

Requirements

- Support 6,000 students across all of its campuses
- Enable a multimedia learning environment to facilitate learning
- Be able to locate missing laptops and projectors
- Provide easy troubleshooting for connectivity issues

Implementation

- A full-scale Xirrus 802.11n deployment
- Deploy Xirrus Management System
- Utilize XMS built-in location utilities
- Use multi-radio Arrays to increase location accuracy

Wireless infrastructure

The second main component of the RTLS system is the wireless infrastructure. The wireless infrastructure picks up the signal of the client devices, then relays the information to the back-end location system software (see below). Xirrus Arrays provide several advantages over traditional APs as the wireless infrastructure. First, the Arrays have multiple radios, which provide more signal data points for locating a client. Second, Xirrus Arrays use directional antennas compared to traditional AP's omni-directional antennas. Directional antennas give a more precise location of a device because the RF signal is focused on a particular area.

Location Services system and software

The final piece of an RTLS offering is the back-end software system. The back-end software aggregates the signal data, processes it to determine location, and presents the results in a meaningful way to the users. The back-end software system can be composed of multiple parts depending on what is needed by the enterprise implementing the solution. For instance, one system might aggregate the location data to provide the location of a particular user. Another system might be used to provide specific offers to that user based on where they are located. For RTLS solutions, different pieces can be mixed and matched to get the best solution for a particular need.

RTLS solutions can provide many benefits to companies and organizations. The key when implementing RTLS is to be sure that the area being covered has sufficient Wi-Fi network coverage so that the client devices can always communicate with the infrastructure in all areas covered. The system should be designed so that at least two radios of coverage at the minimum required signal level or greater are available in all areas for better device triangulation.

For more information

For more details about how Xirrus can help you solve the pending influx of wireless devices, visit us at www.xirrus.com or send us an email at info@xirrus.com.

About Xirrus

Xirrus provides unique, high-performance, array-based wireless solutions that perform under the most demanding conditions, while delivering wired-like reliability, superior security, and less infrastructure requirements. Xirrus is a privately held company headquartered in Thousand Oaks, CA.

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