

How RFID Shifts Data Center Asset Tracking into High Gear



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Asset tracking plays a vital part in the management of data centers. While to an outsider the racks and cabinets in a data center may appear static, the environment is highly dynamic. Servers get moved, updated and maintained constantly, requiring efficient and time-sensitive asset management.

Most data centers used to be maintained manually. Employees scan barcodes and update spreadsheets. This procedure is far from instantaneous and is incompatible with the ever-changing nature of the inventory. By the time employees have finished the task, the information they have gathered may already be out of date. Barcodes must also be scanned individually, a repetitive and time-consuming job.

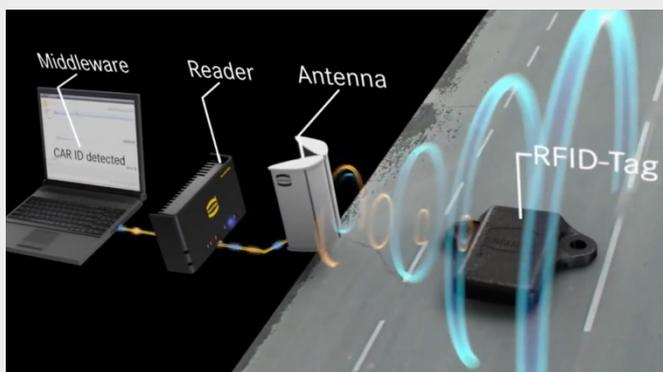
Once scanning has been completed, updates may be delayed or forgotten entirely. In between scans, assets may have been moved or added. There is no assurance that information is 100 percent current. Fortunately, technology has provided a remedy to the failings of barcode asset management systems. Modern RFID, or radio frequency identification, offers instantaneous tracking.

Why Tracking Servers with RFID is Key to Optimum Efficiency

Employing an RFID system is one of the easiest methods to track servers. By continuously pinging all servers, RFID can be used to update an asset control system in real time. Inventories will always be current, and staff will be promptly notified of any additions or removals. Not only will tracking be up-to-date, but it also will not be subject to the inaccuracies introduced by manual scanning and the errant keystrokes that may accompany the use of Excel or other spreadsheets.

With RFID systems, data can be accessible anywhere. The software can be programmed to instantaneously synchronize with a data center infrastructure management (DCIM) system or other management software. An RFID system can also be used to monitor the tags that exit and enter a facility. Appropriate personnel can receive notifications upon the removal of servers from racks or rooms.

The nightmare that haunts every data center manager is downtime. The expense of this catastrophe has risen to [\\$7,900 per minute](#). Precise and accurate asset management is an important line of defense against devastating losses.



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What's Needed for an RFID System

RFID is a comprehensive system that is made up of both hardware and software components. The basic foundation of an RFID system includes tags, antennas, readers and middleware.

1. Tags/Transponders - They Store the Data

The **tag/transponder** is attached to the tracked asset and is the link between the asset and the RFID system. Tags contain both an IC chip to store its identifier and data as well as an antenna to communicate with the RFID reader.

Tags can be either *active* or *passive*. Active tags require an internal power source to transmit data continuously. A passive tag receives its power from the RF field generated by the reader. It's powered only when needed so the overall amount of power used is less compared to active tags.



RFID Transponder

2. Antennas – They Collect Data from Tags

An **antenna** communicates with the tag by transmitting an electromagnetic read field. This field is typically cone-shaped with a small radius at the antenna that widens with distance. This feature can be problematical in a data center environment where servers reside on racks. A conical read field may miss servers on racks at the field's edge. The metal intensive rack may also interfere with the conical RF field. For this reason, a special type of antenna with a cylindrical travelling electromagnetic wave field is needed. This antenna that can be used in Data Center racks without that risk is the HARTING LOCFIELD and is discussed in more detail later on in this paper.

3. Readers – They Process Data

A **reader/interrogator** powers the antenna, analyzes tag data and communicates this information externally to other systems. The reader settings can be adjusted to optimize the performance of the overall RFID system.

4. Middleware - It Translates the Data

Middleware is an essential element in the elimination of manual entry. It allows the data generated by the RFID to be accessible to other applications. Middleware also provides for monitoring, formatting, and filtering of

information. It is a vital but often overlooked component of an RFID system.

It is possible to combine the reader and middleware within an RFID-compatible edge computing device, like the HARTING MICA RF-R300.

Four Pro-tips for Selecting the Right RFID Components for Data Centers

There are many different RFID solutions for many different industries, including retail, medical, and of course, data centers. Navigating what is needed for a specific environment can be difficult. The following recommendations are best practices for implementing into a data center environment.

1. Use passive tags to increase reliability.

Temperature control is essential to the proper functioning of hardware. Active tags bring both heat and weight to the server rack. Selection of passive tags will minimize potential damage from both of these factors. Active tags also need to be replaced more often due to their internal power source.

2. Make sure your tags can be used in metal environments.

The RFID system should be compatible with the arrangement and construction of racks. Metal cages can interfere with radio waves. Selecting components that are designed for use in metal environments is key to ensuring reliability.

3. Ensure the RFID System is Compatible with Other Systems.

The most vital aspect in the selection of an RFID system is its ability to integrate with the DCIM system already in place. The provider of a system may offer an integration team that will ensure that all aspects of RFID asset tracking are performing smoothly and efficiently.

4. Develop a read zone that works with your environment.

Racks will not be isolated by a conical read field. Workable equipment must correctly read every signal. An alternatively shaped field will be more effective with the configuration of data center equipment. For the Data Center market, an antenna with a cylindrical travelling electromagnetic wave field around the antenna wire, such as the HARTING LOCFIELD, is necessary.

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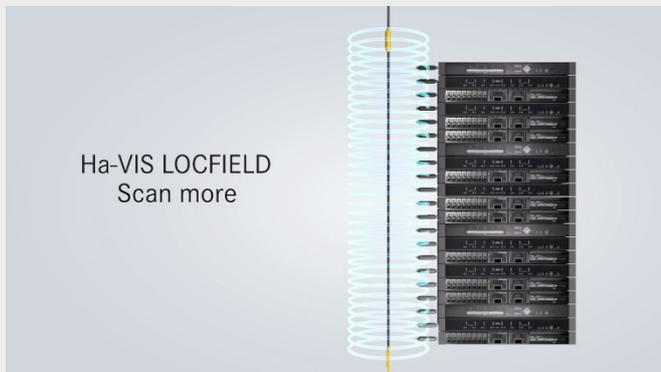
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Why HARTING is the Key for Asset Tracking in Data Centers

One system that addresses all needs of the RFID tracking in Data Centers is the HARTING RFID system using a LOCFIELD Antenna. This solution combines energy-saving passive tags that are compatible with direct placement on metal with HARTING LOCFIELD antennas and readers.



HARTING Ha-VIS LOCFIELD Antenna

The HARTING LOCFIELD antenna creates a cylindrical travelling electromagnetic wave field around the antenna wire. This cylindrical read field avoids the inherent difficulties of a conical field. It can be customized to read a distance of only a few centimeters up to several meters depending on the configuration of the equipment used. The antenna is also flexible, allowing for complete customization.

Inventory time will be slashed by utilizing the full feature reader. It has the capacity to receive signals from up to 150 tags per second. This reader provides easy to use power, Ethernet, I/O and serial interfaces alongside embedded middleware and overhead for software customization.

The HARTING RFID system can also connect to the software of the existing DCIM. The system comes with a web-based interface designed for fast deployment and easy management. Its functions include tracking changes in real time, searching tags and publishing reports.

The LOCFIELD product also avoids the metal cage interference associated with many traditional systems. It is compatible with all data center racks and cabinets. Signals are readable regardless of how servers are stored.

HARTING has recently launched an RFID IIoT Starter Kit specifically for asset tracking. This kit has everything needed to prototype a basic RFID application in under 10 minutes. Find out more at [HARTINGMICASTarterKits.com](https://www.hartingmicastarterkits.com).

To discuss RFID in Data Centers in more detail, please contact

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