

# **Active Solutions for Active Environments: Achieving ROI through Automated Physical IT Asset Tracking**

## Introduction

Tracking and managing physical IT assets in organizations is a never-ending challenge. Experience indicates that the level of difficulty and expense increases dramatically as an organization becomes larger, more complex and distributed across multiple sites and geographic locations. Understanding the source of the costs associated with physically tracking IT assets is the key to streamlining the process. Understanding the distinction between tracking enterprise assets and merely collecting inventories of equipment and related static location data is critical to any organization that seeks to implement an IT Asset Management program.

## Physically Tracking IT Assets and Why It Is Important

Physically tracking IT assets involves accurately knowing the quantity, type, characteristics and physical location of all IT assets. While most IT organizations have implemented centralized controls to manage their software licenses and maintain ongoing audit procedures, they often struggle to match that accuracy when it comes to their valuable servers, computers, test equipment, networking hardware and storage devices. Yet, the potential security vulnerabilities, compliance risks and overall operational inefficiencies caused by a lack of institutional control over all of an organization's IT hardware is top-of-mind to most every CIO and CFO.

The following are just a few of the reasons that real-time IT asset tracking is rapidly becoming a priority for Fortune 1000 and mid-sized companies, government agencies, healthcare providers and other large organizations.

### Inventory Control Costs

- From the help desk to the maintenance lab to the security desk to the purchasing office, the burden of managing physical IT assets is a daunting task for IT groups. In a 2,500-person company, expect to find an average of one desktop PC or laptop

PC, plus one LCD monitor for each employee. That's 5,000 assets to control. Add in the servers and data center technology that drive the enterprise applications combined with peripheral IT equipment such as printers, projectors and copiers. Now, the total number can easily be between 6,000 and 8,000 IT assets. The failure to properly manage these resources often results in significant, recurring—but avoidable—costs in time and money stemming from:

- Expending several man-months of IT staff time to conduct a manual inventory, searching for missing assets and reconciling assets that can't be found.
- Over-purchasing hardware to ensure proper availability.
- Replacing “lost” items before realizing their total value.

### Locating Misplaced Equipment

Locating computer equipment for service or upgrade is a task IT employees perform every day. With annual or biannual inventory cycles, the asset repository gradually becomes out of date as people move assets but don't update the system. IT staff waste many hours each month searching for assets that need to be serviced. IT employees are a key company resource. Therefore, increasing their efficiency is important, as most IT departments have to do more with less, especially in today's economy.

### Governance and Compliance

Having accurate inventory information about capital assets is a high priority for most corporations. An accurate inventory affects not only the company's financial position but also its ability to effectively manage a department's physical resources. Many publicly traded companies now have implemented much stricter government requirements for tracking capital expenditures and internal uses of capital equipment.

## Asset and Data Security

Data security is a high priority for most businesses. However, locked-down firewalls, anti-virus systems, spam filters and other digital security measures are useless when an IT asset leaves the building and no one knows because there's no record. When that happens, it is impossible for the CIO to assure the CEO that the company's data is secure. Why? Because the IT department cannot physically locate the asset or know who has access to it. While it is standard practice for laptops to leave a building, a server leaving the data center (or the building) should be a closely-monitored exception.

## Leased Equipment Returns

Many companies lease a percentage of their high-dollar IT assets. While leasing may offer monetary advantages, it has a big potential pitfall. Companies often fail to return leased assets on time. The main reason? They can't locate them. The result is late fees, or worse, the leasing company continues to charge normal monthly lease rates until the item is returned. Having the ability to easily locate leased assets can virtually eliminate the adverse consequences.

## Data Center Optimization

Data centers are not static. It's estimated that data centers see from 24 to 40 percent of their assets change or move each year. Why?

- To optimize power and cooling.
- To replace dated equipment with newer equipment.
- To implement virtualization technology.

The inability to physically locate specific data center assets makes all of these efforts highly inefficient. Erroneous asset data becomes input for automated data center modeling and planning software. Moreover, it introduces opportunities for loss, misappropriation and unscheduled downtime.

## Data Center Expansion or Relocation

Data center expansion or relocation is a fact of life for most organizations. Expanding or relocating even a small data center is a headache, requiring extremely precise project management and coordination. Timing is everything. The more that assets move, the greater is the chance that a critical asset will be misplaced or lost.

## *Distributed IT Assets vs. Data Center Assets*

Enterprise computing assets generally are situated inside the data center or distributed throughout the company and across geographies.

Distributed IT assets include laptops, desktops and monitors, plus networking equipment and servers installed in remote closets and computer rooms. These may be dispersed across multiple floors, multiple buildings, multiple campuses, sites and cities. Much of this equipment is mobile, complicating the ability to physically track it. Moreover, distributed assets are subject to:

- Less stringent change control processes.
- Asset ownership changes (i.e., which employee "owns" the equipment).
- Installation in non-standard locations, which makes finding and reading ID tags more difficult.

At first glance, tracking and managing data center equipment might sound like a much easier problem to solve because the assets there are all supposed to be located in the same physical room or space. However, the large number of assets to track in data centers can quickly become problematic. Furthermore, there are a number of specific factors that complicate physical asset tracking in the data center, including:

- Difficulty in easily locating and reading asset tags on rack-mounted equipment.
- The confusion caused by inventorying large numbers of identical-looking rack-mounted assets.
- Frequent adds, moves and changes of assets inside the data center.
- Strict change control procedures and rules around opening rack enclosure doors.

Regardless of the IT asset type (distributed or data center), there are quite a few hurdles to overcome in order to precisely track them.

## ***The True Cost of Physical IT Asset Tracking***

A large chunk of the true cost of IT asset tracking can be found in the ongoing or recurring costs of physically performing a manual inventory. The frequency of a full inventory cycle varies according to each company's internal policies. IAITAM (International Association of IT Asset Managers) recommends inventorying distributed IT assets once a year and data center assets twice a year. According to IAITAM, a full inventory cycle consists of two key actions:

- **Inventory Collection:** This is the act of physically finding each asset, capturing and documenting its location and matching it to a unique identifier (tag ID).
- **Inventory Reconciliation:** This is the process of comparing and bringing into agreement the results of the previous inventory with the current inventory. Often, a significant number of assets recorded in a previous inventory fail to show up on the current inventory. IT staff must then find and disposition each "missing" asset to successfully complete an inventory cycle.

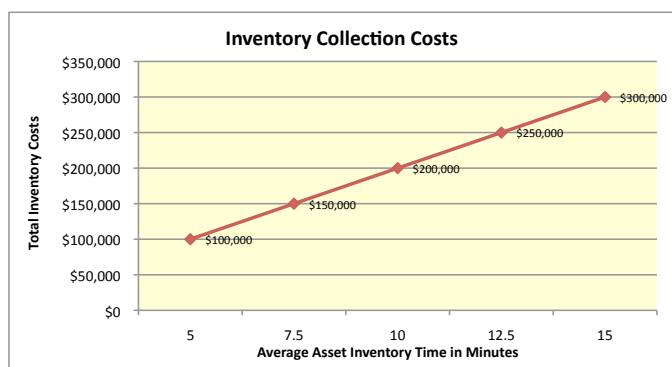
Full inventory cycles are expensive, time consuming and labor intensive. In addition, they divert precious and expensive IT resources away from other critical projects. However, a full inventory cycle is the only way an organization can know with certainty what physical assets they have and where they are located.

A problem with any inventory cycle is that the results are soon out of date, since assets are constantly moving, out for repair, etc. Such changes often are not documented in the asset repository system, so later when an asset needs to be located, it is not where the system says it is. This results in more staff hours consumed searching for equipment.

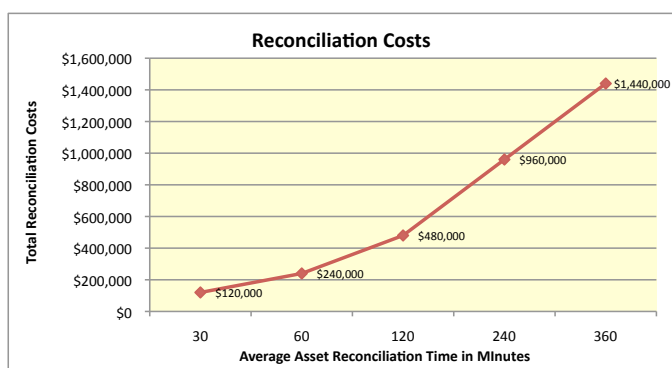
The following example illustrates these costs.

A major government agency was using barcode technology for physical IT asset tracking of their distributed IT assets. With some 16,000 IT assets that must be inventoried yearly, the agency typically allocated eleven IT staff people over six weeks (66 total man-weeks) to complete a full inventory. An average of about 10 minutes per asset was required to locate and collect inventory data about each item. Using a burden rate of \$75.00 per hour for the IT staff, the labor costs for performing the inventory worked out to \$200,000.

The inventory collection was typically about 80 percent accurate. This meant that 20 percent of the 16,000 assets (~3,200 assets) had to be manually reconciled. The reconciliation involved time spent searching for the asset and finding it, or, if not found, documenting the paper trail for the asset. This information would be sent to the Finance department to write off the asset. The time for this activity is conservatively estimated at 30 minutes per asset reconciled. Therefore, the agency would burn up some 1,600 man-hours to reconcile the 3,200 assets, a labor expense of \$120,000. The total costs for a full inventory and reconciliation cycle came in around \$320,000, or 107 man-weeks.



*Figure 1: Inventory collection costs for 16,000 assets. The longer it takes to find and inventory each asset, the more the costs of the inventory collection process grow.*



*Figure 2: Reconciliation costs for 3,200 assets (20 percent of 16,000 total assets). The longer it takes to reconcile an asset, the more the costs of the reconciliation process grow.*

Remember that the \$320,000 is a recurring cost every time an inventory cycle is completed, which is typically a yearly event for distributed assets. So, over a five-year period, this agency spends seven man-years, or \$1,600,000 in labor costs on inventory collection and reconciliation.

Inventory collection and reconciliation costs are directly related to the number of assets, the time it takes to inventory each asset, the percentage of assets that require reconciliation and the reconciliation time. An interesting thing to note here, is that inventory reconciliation is just as significant an expense as inventory collection.

In addition to inventory collection and reconciliation, there are related costs that an organization may incur because of outdated inventory information about their IT assets.

These include:

- Labor costs for the time required to physically locate an asset for repair or upgrading. If one-third of the assets need to be found during a year and the accuracy of the asset database is 90 percent on average, then an asset “search expedition” will be launched for 33 out of every 1,000 assets during a year. For an organization with 16,000 assets, that works out to 528 searches annually. If on average these searches take two hours, that’s a \$79,200 recurring yearly labor cost.
- Replacement costs for assets that cannot be found. If one-half of one percent of assets cannot be located, that would mean an organization with 16,000 assets would have to purchase 80 replacement assets each year.
- Labor costs for keeping an asset repository database up to date with each asset move or change as a result of a change request.
- Late fees incurred because a leased asset could not be located for return at the proper time.

## Automation is the Key

The elimination of human labor costs and time is essential to having a physical asset management solution that truly works and does not drive up the total cost of ownership of the managed assets. The only way to eliminate human labor costs and time is to have an automated physical IT asset tracking system. The base technology that makes a fully automated system possible is Active RFID.

## What an Automated Solution Looks Like

### Active RFID Tags & Readers

Active RFID tags are “always on,” constantly transmitting information to an active RFID reader network. Active tags transmit over long distances, making them a great foundation for automated asset tracking. A single active

RFID reader can monitor and inventory hundreds of active tags over an area up to 15,000 square feet. If more precision is desired, reader coverage zones can be reduced. Active RFID asset tracking systems utilize “beacon” tags that broadcast their status using encoded radio transmissions. Readers can be permanently installed in strategic locations (e.g., storage rooms, high traffic areas, exits) to report the presence and status of all beaconing tags within targeted areas or zones. Overlapping readers and signal strength analysis can be used determine asset location with great precision. Readers process the tag transmissions in real-time to immediately locate and identify tagged assets in defined areas.

Alternative methods such as barcode and passive RFID improve on a purely manual method but do not come close to a fully automated asset tracking solution. Barcode

requires line of sight between the reader and the label. Passive RFID requires close proximity between the reader and the tag, and transmission can be erratic in areas where metal is prominent.

An active RFID asset tracking solution provides a means for always knowing the physical location of each tagged asset. This enables IT managers to always have accurate, precise and up-to-the-minute inventory reports and asset location information at their fingertips. Deploying an active RFID asset tracking solution puts an end to both “doing inventory” and the high labor costs associated with the physical inventory cycle.

**An Active RFID solution designed for IT asset tracking should have the following characteristics:**

- Long read range, with readers able to consistently read tags over areas up to 15,000 square feet.
- Highly accurate data reads ensuring that data is collected even under heavy load and high asset density scenarios.
- Small tag size available in a variety of form factors for mounting to different types of IT assets such as laptops, desktops, servers, switches and routers.
- Affordable pricing. List pricing for active RFID tags should be less than \$20, and lower based on volume. A \$15 tag amortized over five years is \$3/year.
- Variety of tag options, including motion sensors and tamper detection.
- Long battery life and fast beacon rate. At a beacon rate of once every 10 seconds, the battery should outlast the life of the IT asset (typically five years). Notification of low battery conditions should be received well in advance of the battery dying.
- Asset location information with various levels of granularity. The solution should indicate in which zone a tag is located, with optional pinpointing of the exact room or rack in which an asset is located.
- Easy-to-integrate with existing asset management applications on the market today (such as those from HP, IBM, and CA).

An Active RFID solution that meets the above requirements can easily provide real-time asset inventory and asset location information and also enhances asset physical security at a reasonable cost that returns huge savings over the life of the asset.



## Robust Asset Management Software

The software should make it simple to manage your assets from deployment to retirement, allowing you to easily view asset deployments across departments, buildings or entire organizations. Current and historical asset attributes—financial data, physical location and contractual information, for example—reside in a database with flexible access methods. Physical asset location is tracked in real-time, enabling users to quickly locate and identify equipment for maintenance and service, avoiding costly downtime. Automated alerts, reports and graphs should be configurable for immediate notification of changes in asset location or condition. Features such as user-defined fields help adapt the software to specific customer requirements. Inventory reports enable users to proactively respond to audits and automate their regulatory compliance efforts.

## Examples of Active RFID Asset Tracking Solutions

Now that we've discussed the concepts behind and the advantages of a real-time IT asset tracking solution, let's outline two example deployments using Real-Time Physical IT Asset Tracking from RF Code.

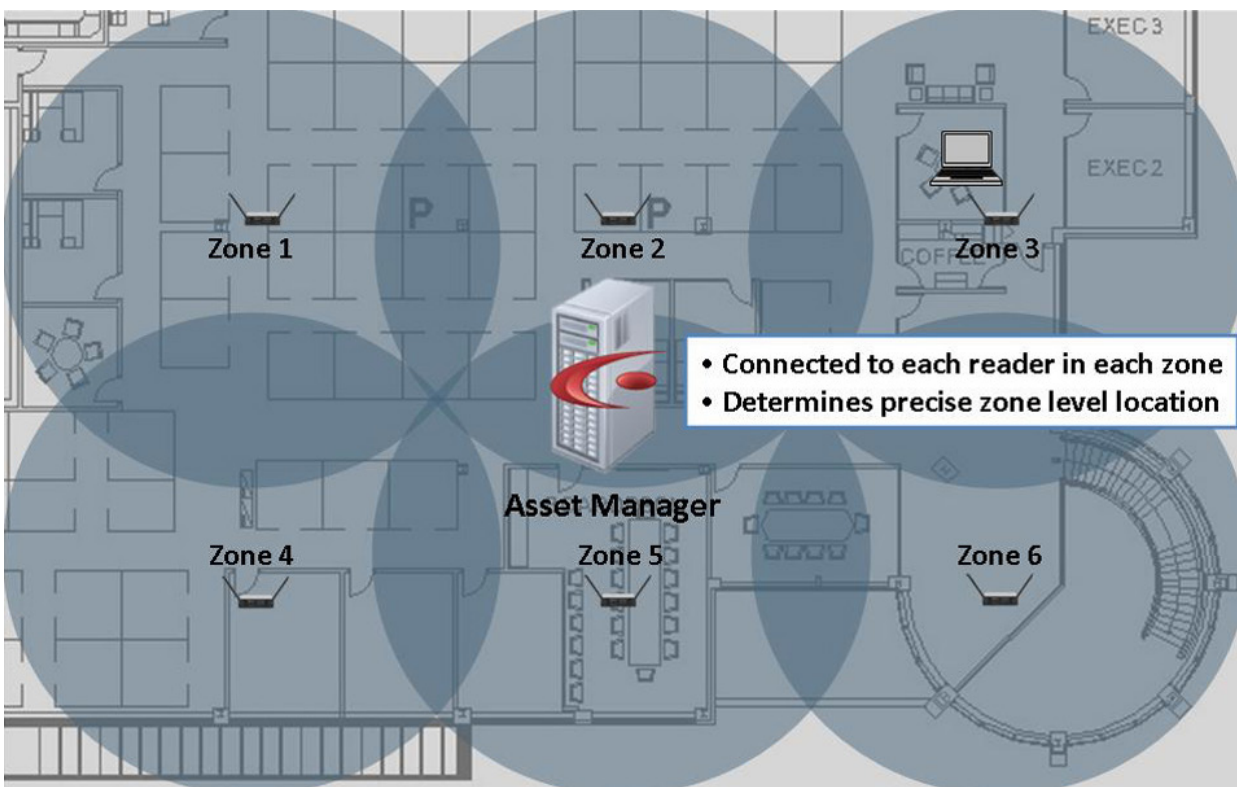
### Solution Example – Distributed IT Assets

There are two levels of granularity for tracking distributed assets: room level granularity and zone level granularity. In this example, we'll use the zone level granularity. This provides real-time inventory information as well as the general location of the asset.

To achieve zone level location information for distributed IT assets, the RF Code zonal solution will be deployed.

This solution consists of the following components:

- Fixed / zonal readers
- IT asset tags in various formats



*Figure 3: An example of a distributed IT asset solution.*

- Asset Manager software

RF Code fixed readers are deployed in various locations in the buildings and floors where IT assets reside. The read range of the reader varies based on building construction, but a good rule of thumb is that each reader covers about 10,000 to 15,000 square feet. RF Code active RFID tags are affixed to each IT asset.

The RF Code Asset Manager software communicates with each of the fixed readers. Tag location information may be communicated upstream to the appropriate enterprise asset management application. Once implemented, the enterprise management application can now receive notifications of asset moves and changes in real-time.

For the government agency scenario described earlier in this paper, deploying 16,000 distributed assets with about 35 coverage zones could potentially save over \$2 million over the span of five years compared to using handheld barcode readers. Once the initial investment

is recovered, annual savings are estimated at \$492,000, which breaks down per year as follows: \$200,000 labor savings in inventory collection, \$120,000 labor savings in reconciliation, \$79,200 in time not spent searching for equipment, \$12,800 labor savings in manual asset repository updates and \$80,000 cash savings by avoiding unnecessary equipment purchases to replace “missing” devices.

From a time perspective, this organization will recover 33 man-months of IT staff time each year to apply to higher-value IT activities such as provisioning servers, changing router configurations and application performance tuning.

### Solution Example – Data Center IT Assets

There are two levels of granularity for tracking assets

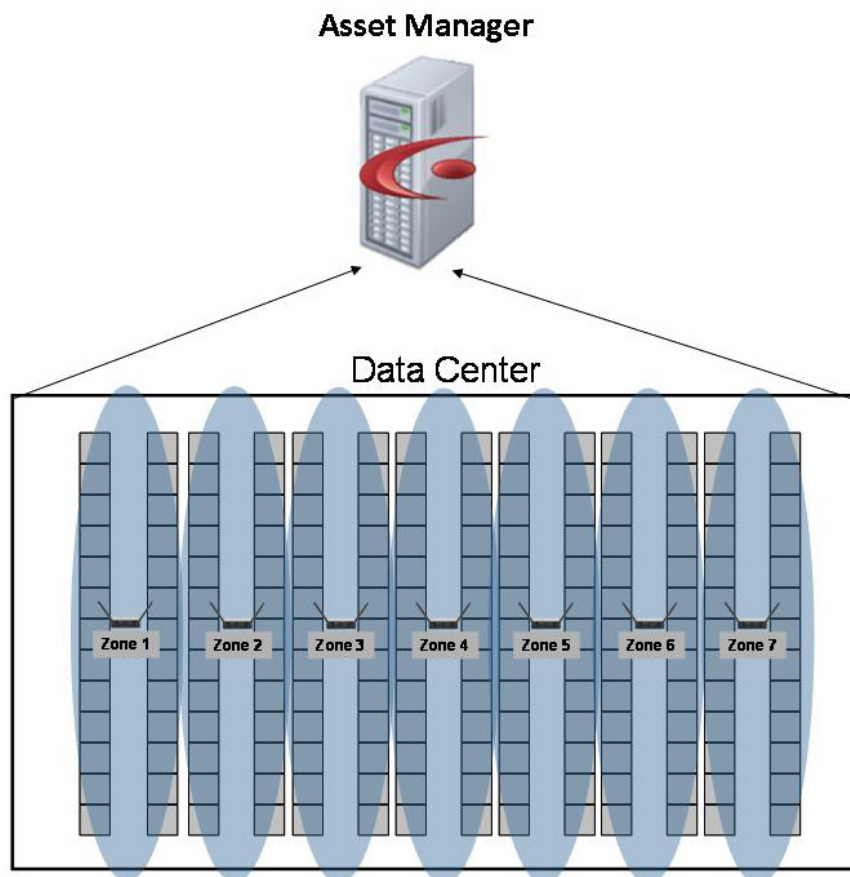


Figure 4: An example of a data center IT asset solution.



in a data center—rack-level granularity and zone-level granularity. First, we'll look at zone-level granularity to provide zone-level location information for each asset tagged with an RF Code active RFID tag.

The RF Code zonal solution consists of the following components:

- Fixed / zonal readers
- Active RFID tags for rack-mounted IT assets
- Asset Manager software

The data center space is segmented into zones with one RF Code fixed reader deployed in the center of each cold aisle. RF Code active tags are attached to each asset in the racks. These tags have a paper-thin “tongue” with an adhesive backing that attaches to rack-mounted devices. The fixed readers are connected to the datacenter LAN.

The RF Code Asset Manager software is installed on a system that will communicate with each of the fixed readers.

As in the distributed example, Asset Manager may communicate tag location data upstream to the enterprise asset management application so that it can be notified of asset moves and changes in real-time. If the customer does not perform asset management from an enterprise application, RF Code offers a robust, flexible, and easy-to-use console application, Enterprise Console for Asset Manager.

For an example deployment of a data center with 500 racks, with an average of 30 assets per rack (15,000 assets), we estimate that a barcode inventory collection consumes 263 man-hours. If 10% of the assets from the previous inventory cannot be found, the IT team will have to reconcile 1,500 assets, which we estimate will consume another 1,500 hours. For a data center, the recommended inventory frequency is twice yearly, so the total for inventory and reconciliation per year would be 3,526 hours. In addition to the hourly costs, as equipment

moves are made and not documented in the system, some “missing” equipment will have to be replaced. We estimate the total costs of the barcode asset tracking method at just under \$470,000 per year.

With zone-based automated asset tracking, this organization could potentially save over \$2 million over the span of five years and achieve full return on investment in about 9 months. From a time perspective, 21 man-months per year of IT staff time will be recovered to apply to higher-value IT activities.

Some data centers need to track assets to the individual rack-level. For these data centers, RF Code offers a product line that combines active RFID with infrared (IR) technology. IR transmitters are installed in each rack, and each IR ‘rack locator’ is programmed with a unique location code. As with the zonal solution, RF Code active tags are attached to each asset in the racks, but these tags have an onboard IR receiver. IR-enabled tags monitor their environment for incoming IR signals and periodically broadcast both their own unique ID and the IR location code. This provides a method for rapidly locating tagged assets with rack-level precision. The same reader infrastructure deployed for a zonal-based solution can be used for the rack-level solution.

With rack-level asset tracking, the same example deployment of a data center with 500 racks with an average of 30 assets per rack (15,000 assets) could potentially save more than \$2.4 million over the span of five years and achieve full return on investment in about 13 months. Nearly 28 man-months of IT staff time per year would be recovered to apply to higher-value IT activities.

The reason that rack-level asset tracking realizes greater savings than zone-level is because it pinpoints the asset location to the specific rack, thereby eliminating time spent searching for assets. If one-third of the assets must be located sometime during the year (for example for maintenance), and the asset repository database is 90% accurate on average, with an average search time of two

hours, then over the year, 990 hours will be spent searching for equipment (15,000 x 33% x 10% x 2 hours). Rack-level tracking removes this time expenditure.

## Summary

In IT organizations everywhere, thousands of hours of valuable staff time are being soaked up by manual inventory, reconciliation, and searching for equipment. These hours are contributing nothing to IT's mission of improving the efficiency and effectiveness of the overall organization, and the tasks underutilize the expertise and training of the IT staff. What if IT management could recover these wasted hours and invest them in productive IT activities and projects? The technology is now available to accomplish that by fully automating inventory and asset tracking activities.

Further, an automated solution for performing periodic audits of an organization's sensitive IT equipment is

the only effective way to achieve a time-independent verification of asset records. In supplying real-time inventory and physical location data for an organization's IT assets, an active RFID solution designed for the strict requirements of both data centers and the extended enterprise provides an efficient and cost-effective method of obtaining the critical asset tracking information an organization needs to:

- Maintain audit and regulatory compliance;
- Have 100 percent inventory accuracy and visibility;
- Ensure that IT resources are used most productively; and,
- Reduce CAPEX and OPEX by automating the ability to have accurate asset visibility without incurring manual costs.



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