# Data Center Re-architecture with RFID

## Managing Data Center Architecture

Regulations such as Sarbanes-Oxley (1) and HIPAA (Health Information Portability and Accountability Act) mandate that all companies maintaining sensitive data such as financial and health records not only prove they own their own equipment, but also have complete control over equipment content security.

At the end of each fiscal quarter, companies such as financial institutions, large scale manufacturers and content delivery network providers need to account for every server that is currently in service, has been moved, replaced, are in need of replacement and at the base lever, servers and assets that have entered and exited the server room.

An average data center for a medium to large size company contains in excess of 10,000 or more data servers. Organized in server racks spread among 100's of rows and containing up to 20 servers per rack, accountability for each server in every rack becomes a challenge not only to perform accurately, but also in a timely manner. In addition (particularly the financial sector), companies have a need to account for and destroy hard disk drives containing confidential information when they reach the end of their lives.

Up to this point, data centers have utilized a combination of barcode and manual data entry as a means to keep track of equipment. The combination of physical labor and human error causes excessive inventory time and also widens the possibility of inventory omissions which would cost the company in terms of productivity and monetary loss.

# RFID and the Challenges of Technology In a Metal Rich Environment

To address the challenge of increasing inventory accuracy and decreasing inventory time and physical labor, data center managers have turned to RFID. In addition to offering instantaneous asset identification, the biggest benefit is not requiring focused line of sight reading, of which is required to read a barcode. This reduces the amount of time spent reading each asset and allows for the RFID reader to identify more than 1 asset in a given instance versus "one at a time" with barcodes.

The metallic rich nature of a data center (metal server racks and cases) poses a challenge to the physics of RFID. Metal has a tendency to interfere with a RF signal. The challenge at hand is to use a RFID tag that is not only rugged enough to survive the day-in/day-out shuffle of servers from one location to another, but also provide performance that is not hindered by the presence of metal. Additionally, physical size and form factor of RFID tags have limited use in applications such as servers and small IT assets due to limited amount of tag real-estate on an already crowded sever faceplate and chassis.

Passive RFID technology has traditionally been challenged when attempting to function either in a metallic rich environment or when directly applied to metal. Active and Battery Assisted Passive (BAP) RFID and Passive RFID companies such as Xerafy have been able to provide on-metal, rugged tags that meet the challenges of today's data centers. The latter is a more viable choice considering the lack of a battery that is limited by the number of times it is interrogated by an RFID reader.


Figure 1: Xerafy Data Trak Tags

Customized to meet the standards of the financial services industry, Xerafy offers the Data Trak™. A versatile tag in a 1.5" form-factor fits nicely on a crowded server faceplate and chassis or can be attached as a hanging tag. The Data Trak features between 5-11 feet (2-4 Meters) of read range respectively on metal and off-metal surfaces. For blade servers or assets where space to affix tags is limited, the Pico$^{X}$ tag is the smallest read-on-metal tag, and can fit within a 2D barcode label,

In addition, Xerafy offers –iN series of tags that may be embedded into server faceplates that overcome the immediate proximity of metal. The latter offers a completely transparent product offering at the OEM product level versus post-production external tag application.

# RFID at Bank of America Data Centers

Bank of America spurred adoption of RFID technology for asset tracking of financial IT servers. The company has worked closely with RFID Global Solution for deployment of RFID to track IT assets. Bank of America developed an industry-wide RFID standard for asset tracking through the Financial Services Technology Consortium, which will help serve as an RFID roadmap for other financial services firms—or companies in other industries—looking to employ RFID to track IT assets.

Bank of America identified three main business areas where they benefitted from automating the tracking of its IT assets: operational efficiency, risk mitigation and regulatory compliance. One additional return on investment was the employee satisfaction with the significant timesavings when conducting periodic inventory. Previously to inventory a row of servers at a data center, the workers used handheld bar-code readers to scan each server's bar-coded label. Now, using a mobile reader mounted on a cart, they can walk down a row and collect the inventory in just 10 seconds.

The mobile interrogators are mounted on carts that employees wheel up and down rows of server racks and other assets within the data centers, in order to read the passive RFID tags attached to assets. To monitor asset movement, portal readers are mounted around the doorways leading into and out of the facilities, collecting the IDs of tags


attached to servers and other tagged assets as they are removed from and returned to a data center.

In terms of risk mitigation, knowing the location of servers and other hardware holding customer data is a business critical. RFID offers a more efficient process to identify the assets and provide security to the system by triggering an alarm when a portal reader detects an asset being removed from a data center before it is properly cleared for removal.

RFID provides a simply way to comply with Sarbanes-Oxley and other regulations designed to account for corporate assets by having up-to-date, accurate inventory data. The RFID system also offers the bank a better method for tracking the shipping and receiving of the IT assets it purchases. This higher level of visibility will lead to faster payment and order discrepancy resolution with vendors and will also expand the asset visibility throughout the data center.

# Re-inventing Datacenter Architecture

With the use of Xerafy rugged on-metal RFID tags, data centers will experience the benefits of:

- Real time asset visibility
- Inventory management with increased efficiency and accuracy
- Reduced occurrence of un-accounted assets
- Increased adherence to government mandated asset accountability
- Relatively short ROI
- Ability to better manage asset service agreements by better asset maintenance tracking

Overall, data centers have seen approximately 15 times increase in inventory productivity and have reduced the labor as well as reducing time from entire inventory process by 80% to 90% by automating with RFID. This also includes goods ordering and receiving to goods removal and destruction. (2)

The time to account for 10,000 assets in an average center includes:

Figure 1: Server Rack with 16 cards

- 50 Hours: Physical reading of each asset
- 16 Hours: Scan of each asset barcode
- 4 Hours: Scan of each asset RFID tag
- Overall inventory time saved with RFID: 6 Days

In addition, server disk hard drives when decommissioned are assigned a RFID tag for identification throughout the process providing real time visibility to ensure drives have gone through all processes of decommissioning and do not pose a threat of accidentally leaving the facility causing a security breach. Also, IT assets such as laptop computers, network routers and other capital equipment are utilizing Xerafy RFID tags for improved inventory and accountability.

## Contact Us

For more information on this application, product overview or any other questions, please contact Xerafy.


(1) Sarbanes-Oxley Act of 2002, One Hundred Seventh Congress of the United States of America - AT THE SECOND SESSION, H.R.3763, 2002

(2) Financial Industry Embraces RFID For Asset Tracking, Asset Management News, www.assetmgmtnews.com, article 666

(3) Bank of America Deploys RFID in Data Centers, RFID Journal News, Oct. 30, 2008