RFCODE

Case Study

Delivering Enhanced Visibility, SLA Improvement, and Disaster Avoidance for Digital Fortress

Customer Profile

Digital Fortress™, Inc., is a privately held data center provider delivering secure, high density colocation services with carrier and cloud-neutral hosting infrastructure. Digital Fortress utilizes the greenest utility in the nation – Seattle City Light – with over 96% of its energy derived from clean inexpensive hydroelectric and wind power. Since 1994, more than 1,200 customers have entrusted their applications and servers to the mission-critical facilities and network operated by the merged entities of Digital Fortress.

Digital Fortress is located in the Seattle area and comprised of two datacenters. Tukwila facility (TUK) sits on Seattle's Intergate West Campus – part of the largest Internet campus in North America. Facility Size: 42,000 sq. ft., with 3.75 MW redundant power. Seattle facility (SEA) is 25,000 sq. ft. with 3 MW of redundant power, located in downtown Seattle near the waterfront. Together both facilities total more than 60,000sq ft., have completely independent infrastructures, and present their own challenges around monitoring. For more information, visit http://www.dfcolo.com.

"RF Code paid for itself in the first 6 days"

Scott Gamble, Digital Fortress

Objective

As is often the case, it wasn't one single objective that drove Digital Fortress to seek a solution, but multiple independent goals that could only be met with enhanced data center visibility. Outdated monitoring platforms, increasing customer capacity demands, and rapidly shrinking margins for error all combined to present serious obstacles to efficiency and growth, making it clear that greatly improved monitoring capabilities were needed immediately.

Digital Fortress's customers are demanding more power than ever before. While typical per-cabinet power usage projections used to fall in the 1.7 - 2kW range, these days 5kW per cabinet is the norm. In fact some of Digital Fortress's higher density customer require 9 - 15kW per cabinet, with a few using as much as 25kW. With power densities like these, accurate capacity planning and reliable cooling are critical, and continuous environmental monitoring a necessity.

"Between cloud infrastructures and Bitcoin mining, density is playing a bigger part than ever before in our customers' needs," said Scott Gamble, IT manager at Digital Fortress. "Average power density per cabinet continues to rise and with it the criticality of delivering adequate cooling. It's a lot of power and a lot of heat."

In addition to enhanced monitoring, Digital Fortress also needed improved, automated threat notification systems. Increased density has reduced the amount of time available to act on cooling failures. Reaction times have shrunk from hours to minutes, making early detection and immediate notification crucial.

"When density was lower there was simply more time to respond to issues," said Scott. "With today's heat loads we can see a 10+ degree jump in 10 minutes. Good monitoring and alerting is the only way to remain apprised of threats as they emerge and before they're doing damage."

Selection Process

Digital Fortress evaluated multiple environmental monitoring and DCIM platforms before selecting RF Code. Wired solutions needed extensive IP space, required significant cable-plan additions, and with rare exception necessitated a sizable investment in Power over Ethernet (PoE) infrastructure. They also required time and manpower to deploy, driving the up the TCO.

Digital Fortress discovered RF Code at the end of their search and quickly realized that it was going to meet all their needs.

Digital Fortress's downtown Seattle data center.

"We extended our evaluation window to include [RF Code], and it's fortunate we did," said Gamble. "Though I was skeptical in the beginning, RF Code came out as the frontrunner by a significant margin in nearly every way."

Deployment Challenges

The number one challenge facing Digital Fortress was aggregation. In addition to monitoring the environment, Digital Fortress has dozens of components spread across multiple facilities that must be monitored as well—servers, generators, AC units, cooling towers, UPS's/ATS's, fuel tanks, and security systems being but a few. Bringing all this information together into a single set of dashboards is a daunting task for any datacenter.

While these devices typically provide information about their current status, the manner in which they deliver the data varies widely. Some use industry standard protocols such as BACnet, Modbus, and SNMP; others display status on LED readouts or dials; other report status or failures via integrated dry contact and 4-20mA sensors; still others provide information only via proprietary applications. Digital Fortress needed a means to aggregate all this information into centralized dashboards that NOC staff could monitor while in the NOC, and on the floor. RF Code provided the solution they were looking for.

Value and Benefit of the RF Code Solution

After completing their product evaluation, Gamble noted that RF Code stood out from the competition in the following ways:

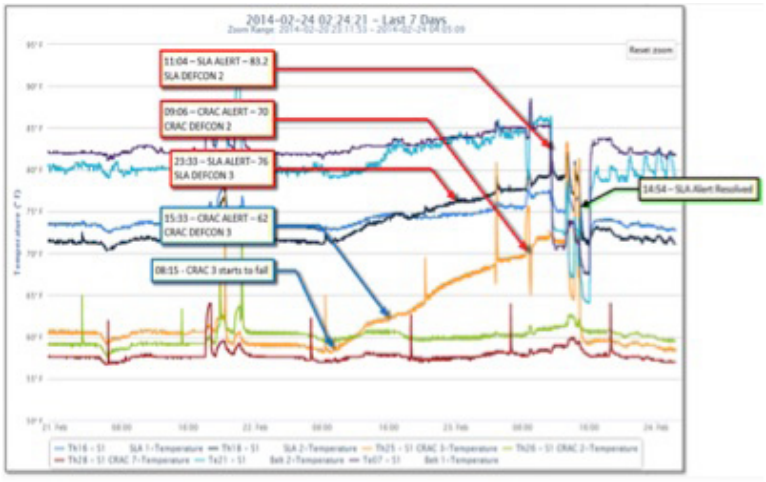
- **Ease of deployment:** RF Code's wire-free sensors and readers were easy to deploy, making sensor and reader installation a fast, simple process.
- **Performance and versatility:** RF Code's wire-free performance in high-density environments was very good, and signal penetration was excellent. Instead of the hundreds of IP connections required for PoE-powered sensors, RF Code's readers use their own wire-free sensor to monitor the environment, requiring only a single PoE connection and a single IP address to do so. Digital Fortress also found that the RF Code sensor network made their older SNMP-based environmental monitoring system entirely unnecessary.
- **Ease of Integration:** RF Code's Asset Manager platform provides the power and flexibility that Digital Fortress needs to build their integrated dashboards, and RF Code's R130 Dry Contact Sensor and R180 4-20mA Sensor Tags make gathering data from equipment with integrated components (such as generators, CRAC units, and fuel tanks) simple, providing a straightforward and cost effective means to develop top-level visibility into their cooling and power infrastructure at the equipment level.
- **Scalability:** The RF Code solution enables Digital Fortress to easily expand their monitoring capabilities as required. RF Code's readers can each receive data from up to 1400 unique sensors, which makes introducing additional sensors as needs grow a simple matter of deploying more sensor tags.

- **Total cost of ownership:** The materials cost of RF Code's solution was 10% lower than the least expensive solution being evaluated by Digital Fortress. After factoring in the savings in PoE switching gear, network cabling, power allocation, and deployment time (in man-hours), RF Code was by far the most cost-effective solution.

Implementation and Deployment

Following a thorough 90-day evaluation process, Digital Fortress ordered the equipment necessary for their full deployment early in January 2014. Deployment began one month later, and was divided into two phases: Phase 1 focused on reader installation and an initial deployment of sensors that provided coverage of Digital Fortress's most sensitive and mission critical areas, while phase 2 extended monitoring to all remaining areas throughout their facilities.

Once all preparations had been made, the deployment process was brief. A single engineer was able to completely deploy and begin monitoring an 18,000 sq ft datacenter floor in just 4 hours. By Digital Fortress's estimates this process would have taken several weeks had they chosen a wired solution.



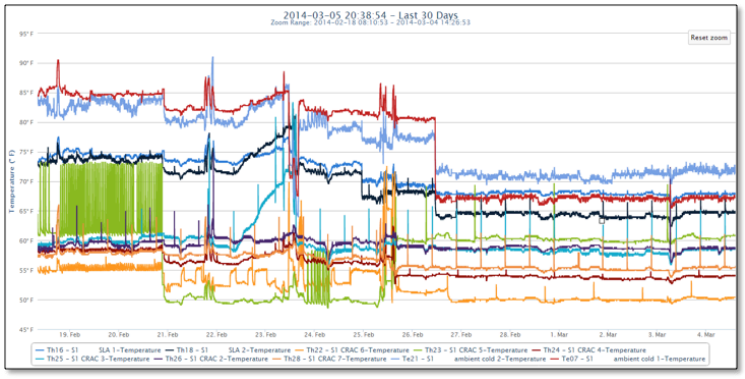
Shortly after deployment, RF Code's real-time dashboards helped Digital Fortress detect a leaking CRAC unit before it completely failed

During both phases of the deployment process Digital Fortress used RF Code's Asset Manager Mobile to troubleshoot sensor and reader placement, ensuring the best possible read ranges and visibility were achieved. Once the sensor network was in place, Digital Fortress began building customized dashboards using the Asset Manager platform.

Results

6 days after deployment RF Code helped Digital Fortress identify a failing CRAC unit before it burned out. After 10 days Digital Fortress was able to drop SLA temperatures on the datacenter floor by better than 11 degrees. Over the course of 4 months Digital Fortress has addressed dozens of issues and are preparing for a hot summer, better situated than ever before.

"RF Code paid for itself in the first 6 days" says Gamble. "We had early warning on what we would come to learn was a failing CRAC in a high-density area of our Seattle facility. This unit slowly leaked more than 25lbs of refrigerant over the course of 24 hours, but reported operating at 100% throughout the event.



The increased visibility into Digital Fortress's thermal environment has translated into an 11 degree temeperature improvement at the SLA level and has reduced power consumption across the board.

"Thanks to the real-time dashboards we could see we had an emerging event, we knew where the problem was, and we knew it wasn't simply a device economizing. Better yet, we also knew the unit itself was misreporting – the panel on the device reported zero issues, but clearly something was wrong." Armed with this, Digital Fortress was able to bring Engineers in on Sunday morning to quickly identify the leak, repair the unit, and bring it back online before it could burn itself out.

That incident wasn't the only gain. Over the course of 10 days Digital Fortress took advantage of the greater visibility provided by RF Code to identify trouble spots, adjust their CRAC units and reposition subfloor containment (air routing). The result? An 11 degree temperature improvement at the SLA level (on the floor, at customer equipment inlet). Additionally there was an increase in efficiency and drop in power consumption across the board.

"Now we have comparative visibility on the whole environment, we're able to configure equipment to work with each other, instead of independently of one another. Units are no longer competing with each other, or chasing their economizing set points. Not only is our environment more stable and efficient, but long term we also expect a reduction in wear and tear too" says Gamble.

Next Steps

Digital Fortress is extending their environmental monitoring solution to incorporate data gathered from generators, cooling towers and power infrastructure. Working with facilities engineers, they are using RF Code's R130 Dry Contact Tags, R180 4-20mA Sensors, and R120 Door Tags to non-invasively extend visibility to systems that would otherwise be expensive or technically prohibitive to integrate with their management dashboards. "Using RF Code we can now apply the same tags and monitor every piece of equipment exactly the same, regardless of model or age," said Scott. "It's simply cheaper, faster, and easier to use RF Code to pull and present this information, than it is to try make different equipment produce the same data in the same way."

About RF Code

RF Code is the world's fastest growing, leading provider of distributed IT environmental monitoring and asset management solutions. As an innovator in the industry, a stand-out feature of RF Code is the capability to collect data in real time through their wide portfolio of wire-free tags and sensors for asset management and environmental monitoring. With an open architecture design, the solution integrates easily to any DCIM system which allows its application to expand outside IT into other enterprises such as healthcare and industrial supply chain asset tracking

RF Code is an essential component of the asset management, risk and compliance assurance, and automated control systems in healthcare, IT services, industrial supply chains, and natural resources / oil & gas industries. RF Code is a privately held company with investors including QuestMark Partners and Intel Capital. The company is headquartered in Austin, TX, with offices and partners in the UK, EMEA, Australia, Asia and South America. For more information, please visit http://www.rfcode.com.

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