Cold Chain Monitoring and IoT— More than Just Temperature Control

INDUSTRY BRIEF

AT A GLANCE:

Cold chains are susceptible to mechanical breakdowns, traffic delays, theft, human error, and numerous other factors. With IoT, issues can be handled in real time, with an entire infrastructure reacting as a single unit.

Refrigerator trucks and temperature-controlled storage facilities are common sites around world, and most people assume that cold chains —moving products that require cold storage between manufacturers, suppliers, distribution centers, retailers (restaurants, grocery stores), and, ultimately, the customer—ensure everything works as planned.

The truth is much different. According to the Food and Agriculture Organization of the United Nations, approximately 1/3 of food perishes worldwide during transit. And that number doesn't include losses of other non-edible, but perishable, cargo like decorative flowers, a $100+ billion market on its own.

While certainly more robust than any time in history (companies no longer rely on ice as the only temperature-control method), cold chains still are susceptible to mechanical breakdowns, traffic delays (truck runs out of gas or waiting for an accident to clear), theft, human error, and numerous other factors. And it's not just businesses that can be affected. Human lives can be at stake when blood supplies and pharmaceuticals are part of cargo. All that has changed with Internet of Things (IoT) and Machine-to-Machine (M2M) communications.

A New Era of Safety and Efficiencies

With IoT, cold cargo becomes 'intelligent' thanks to smart sensors and monitoring. Now, temperatures can be measured in exact degrees and correlated with acceptable norms for any given cargo, generating alerts for the driver and other stakeholders when there is an issue. Sensors can distinguish between being in transit and being stolen, even to the point of activating a 'lockdown' mode to reduce theft. And if cargo is stolen, recovery is rapid as it can be tracked to within inches of its location.

Compliance, especially with products highly susceptible to microorganisms, is automated and simplified as both minute-by-minute and historic reports can be generated on-demand. If there is some issue with the transport

method (truck, ship, etc.), the cargo itself can state whether it is valid for delivery or not, further enhancing compliance. And depending on the implementation, organic materials can send alerts immediately if they become infected due to air quality. With advanced monitoring techniques, little is left to chance as cargo is surveilled from journey's start through delivery.

A Whole Ecosystem Working as One

Today's IoT allows something not possible before—a smart ecosystem. Devices don't live in a vacuum. They talk to hundreds or thousands of other end points, both machine and human. This is especially vital at hand-off, when cargo is loaded or unloaded, with heat-sensitive goods being the most susceptible to changing environmental conditions. In fact, temperature 'excursions' account for 80% of supply chain problems, with trucking being the most problematic form of transport. With IoT, issues can be handled in real time, with an entire infrastructure reacting as a single unit. For example, a truck attempts a delivery after-hours due to earlier mechanical issues, with cargo that can't wait overnight. Well in advance, a receiving crew would be notified to be ready, or the truck would be re-directed to an available warehouse nearby.

Yet there is One Problem

As advanced as IoT / M2M technologies are today, they still are highly dependent on one crucial factor—infrastructure. Smart devices that gather immense quantities of data and communicate in real time require all new levels of internetworking capabilities, including:

Dedicated end-to-end connections

Legacy analog networks cannot handle the amount of data traffic and 24/7/365 usage demands. Digital remedies from carriers do work, but are built on a consumer infrastructure, with IoT / M2M communications added as an afterthought. Imagine taking a classic car to a local oil change place. They can do the job, but can you trust the results? What's needed is a network dedicated exclusively to the unique requirements of IoT / M2M.

Ease-of-use and zero learning curves

There are so many components to a cold chain supply system that in-depth training and similar efforts aren't practical to the average business. Most users have little or no tech knowledge. That means smart devices and their networks must be up and running right out of the box.

Pay-as-you-go pricing

The dynamic nature of smart devices and their applications require flexible pricing structures. Traditional "one size fits all" pricing models would make IoT / M2M systems cost prohibitive.

Ironclad security

Security always is of paramount concern but, with smart devices, there are so many components in so many diverse locations involved that the network always must be the first line of defense.

Future proofing

IoT / M2M technologies are changing constantly, and device software quickly can become obsolete without updates. That's why a network infrastructure must take into account ever-increasing data loads, new device types added, and constant updates among a variety of unplanned events.

What's the solution? Only Aeris IoT Services has the dedicated infrastructure needed to meet even the most demanding cold chain transport system.

AERIS IoT SERVICES IS THE LEADER IN CELLULAR IoT / M2M NETWORKS. HERE'S WHY.

Aeris IoT Services offerings were designed from the ground up, exclusively for IoT / M2M connectivity. That means the solution offers unparalleled flexibility and "future proofing", in addition to remarkably simple operation.

Just look at the advantages:

Reliable and secure dedicated network

Aeris offers an always-on service, anywhere, regardless of the amount of data being generated. And that data is secure as your traffic always is separate from the public internet, unlike competing solutions.

A single provider for all your connectivity needs

With so many devices moving across disparate geographic areas, having different networks can be problematic. Aeris IoT Services is the only carrier-agnostic solution provider that offers both GSM and CDMA connectivity, including 2G, 3G, and 4G LTE. That means with one network, you are connected 24/7, regardless of device type or location.

Device management portal provides complete visibility

Using the Aeris IoT AerPort management portal, Aeris clients have total visibility into every device, including data usage and billing. The AerPort dashboard allows you to manage, monitor, and troubleshoot devices to gain insight into your network operations in near real time. In contrast, Mobile Virtual Network Operators (MVNOs) need hours to register and analyze data going through the network.

Operational support ensures continuous uptime

At Aeris, we back our solutions with industry-leading customer support. Our team is staffed exclusively with IoT / M2M experts ready to help. Offered in three packages, Aeris Infinity Support is available five days a week, with five-minute response times, proactive monitoring, and issue identification.

Lowest total cost of ownership

Through our flexible pricing and transparent management portal, Aeris IoT Billing ensures "bill shock" never happens. We give you complete visibility into the operation and billing of every device, regardless of device numbers, locations, or how they are dispersed.

ABOUT AERIS:

Aeris is a technology partner with a proven history of helping companies unlock the value of IoT. For more than a decade, we've powered critical projects for some of the most demanding customers of IoT services. Aeris strives to fundamentally improve businesses by dramatically reducing costs, accelerating time-to-market, and enabling new revenue streams. Built from the ground up for IoT and road tested at scale, Aeris IoT Services are based on the broadest technology stack in the industry, spanning connectivity up to vertical solutions. As veterans of the industry, we know that implementing an IoT solution can be complex, and we pride ourselves on making it simpler.

Visit **www.aeris.com** or follow us on Twitter **@AerisM2M** to learn how we can inspire you to create new business models and to participate in the revolution of the Internet of Things.

United States Contact:
info@aeris.net
or **+1 408 557 1993**

Europe Contact:
eu_info@aeris.net
or **+44 118 315 0614**

India Contact:
india_info@aeris.net
or **+91 01206156100**