# Comprehensive Tracking and Monitoring Logistics Solution

## Capgemini integrated end-to-end shipping solution integrates the Intel Connected Logistics Platform

Companies ship millions of tons of goods and materials every year. When a shipment is compromised in transit (due to damage, loss, delay, theft, or spoilage), companies lose revenue and productivity as well as goods.

Capgemini and Intel have developed an IoT hardware/ software solution to increase the visibility, integrity, and security of shipments as they move through the supply chain. The end-to-end solution provides near-real-time tracking and monitoring of shipment location, temperature, humidity, shock, ambient light, pressure, and tilt; provides a comprehensive dashboard for effortless monitoring and analysis; and includes programmable notifications and alerts for quick intervention.

### Challenge: Lack of cost-effective, near-real-time shipment visibility

Current shipment tracking solutions either fail to provide near-real-time visibility or are too expensive for package-level deployment, which hinders the ability to mitigate loss, assess responsibility, and identify process issues.

### Solution Architecture: Intel® Connected Logistics Platform

The solution consists of disposable sensor tags, an IoT edge gateway, a mobile device app, and cloud-based dashboards and analytics:

1 **Sensor tags.** Placed on packages to collect data (temperature, tilt, shock, light, humidity, barometric pressure). The tag uses a credit card form factor with a typical battery life of up to 100 days depending on use case (battery life depends on frequency of data upload and amount of transferred data) and includes a security chip and wireless connectivity adapter.

2 **IoT edge gateway.** Familiar smartphone form factor uses Intel® IoT technology with GPS to collect sensor tag data and transmit it via the Capgemini XIoT solution to the cloud for analytics. The gateway battery is rechargeable, with a single charge lasting up to 40 day depending on its use.

3 **Mobile onboarding tool.** A mobile app pairs/ unpairs a tag with the package it's attached to and pairs/unpairs the gateway with the shipment it's tracking.

**1 out of 10**
US e-commerce packages arrives damaged[1]

**1,582**
containers lost at sea each year[2]

**800+**
cargo thefts in 2016 in the US and Canada, with an average value of USD 207K[3]

**15% to 25%**
of perishable goods worldwide lost/damaged along the cold chain[4]

1 Mohan, Anne Marie. "E-commerce packaging pitfalls & opportunities," Packaging World, December 4, 2014, https://www.packworld.com/article/trends-and-issues/distribution/e-commerce-packaging-pitfalls-opportunities.

2 Grey, Eva. "Cargo theft: a billion-dollar problem," Ship Technology, July 30, 2017, https://www.ship-technology.com/features/featurecargo-theft-a-billion-dollar-problem-5882653.

3 American Journal of Transportation. "CargoNet's 2016 Cargo Theft Trend Analysis," January 31, 2017, https://www.ajot.com/news/cargonets-2016-cargo-theft-trend-analysis.

4 Jedermann, R.; Nicometo, M.; Uysal, I.; and Lang, W. "Reducing Food Losses by Intelligent Food Logistics," Philos. Trans. A. Math. Phys. Eng. Sci., June 13, 2014, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4006167.

④ **Dashboards.** Enable shippers to view comprehensive sensor data in near-real-time and receive alerts.

⑤ **Smart Services.** Capgemini provides implementation, device and security management, integration to the cloud and back-office systems using the XIoT platform.

## End-to-end visibility from powerful, scalable Intel® technology and cloud services

**Near-Real-time risk mitigation.** Visibility into package-level condition and shipment location helps prevent and reduce losses.

**Geofencing.** GPS-enabled tracking across the entire journey ensures accurate routing. Users receive alerts when a shipment is off track and proof-of-delivery notifications when shipments are delivered.
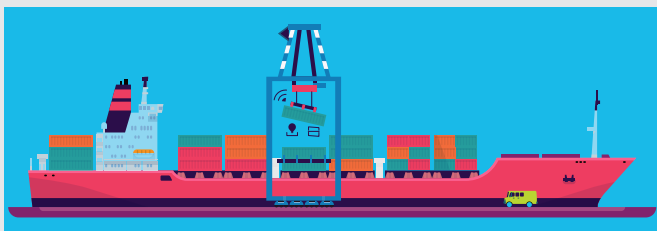
**Predictive analytics.** A dashboard enables shipment monitoring and provides data to help triage problems to optimize the supply chain. Analytics and deep learning can be applied to optimize any container's location and anticipate delivery needs.

**Cost-effective.** An accessible price point for all-in-one devices allows package-level tracking while reducing costs associated with product waste and inefficiencies. Capgemini offers flexible payment options including, but not limited to, licensing fees per device and pay per day, per asset.

## How it works

The Intel and Capgemini solution includes inexpensive, disposable sensor tags; hardwired or battery-powered mobile gateways; a web-based dashboard; and middleware to connect cloud service provider applications. The sensor tags are affixed to each container, pallet, box, or item, depending on the level of granularity desired. Cameras also can be used for asset tracking. The gateways are placed in shipping containers to gather data from tags, provide intelligence at the edge, and push select data to the cloud. Altogether, the solution delivers near-real-time tracking and monitoring during transit, proof of delivery, near-real-time alerts, and data logging. In addition, the multimodal device infrastructure eliminates reverse logistics and provides intelligence at the edge with hardware-level security.

## Use cases



### Track and monitor high-value, sensitive equipment

**Challenge.** Excessive tilt or shock can damage large, costly items such as laboratory equipment or machinery.

**Current solution gaps.** Shock/tilt indicators only provide data upon delivery and don't indicate time and place of an incident.

**Solution.** Real-time dashboard alerts for location and excessive tilt and shock enable root-cause isolation and triage.



### Track and monitor goods at risk of theft

**Challenge.** High-value shipments—like consumer electronics, branded goods (perfume, clothing, and/or alcohol and tobacco products), pharmaceuticals, or intellectual property—are often targeted for theft.

**Current solution gaps.** Package-level tracking can be cost prohibitive and analog devices don't provide a means to identify and address theft.

**Solution.** With cost-effective GPS-enabled tracking along the entire shipping journey, sensors detect near-real-time changes in the environment and conditions, reporting if a single item/package is separated from the others.



### Track and monitor conditions during temperature-regulated inside and outside of package shipments

**Challenge.** Perishables like pharmaceuticals, produce, and chemicals must maintain specific temperatures to prevent spoilage and meet regulatory standards.

**Current solution gaps.** Analog devices only provide after-the-fact information and are cost prohibitive for package-level tracking.

**Solution.** Cost-effective sensors monitor regulated interior and outside temperatures in real time.

## Transform logistics and gain a competitive advantage

- Ensure asset tracking and monitoring of shipment quality, integrity, and security at every stage of the supply chain, anywhere in the world, through Intel® technology based IoT gateways.
- Deploy an easy-to-set-up visibility dashboard, customized for your enterprise needs.
- Seamlessly integrate devices into existing workflows with minimal onboarding.
- Track packages worldwide and scale with your business.
- Deploy robust end-to-end data security and device protection through Intel technology.

## Get on board today!

- The Intel and Capgemini XIoT solution can be provided via SaaS or as a shared revenue engagement..
- The solution includes Intel® architecture-based tags, a gateway, and a virtual gateway for device management.
- Capgemini integrates hardware and cloud technologies and generates APIs for customer data access and analytics.
- The flexible architecture allows for customization.

## Why Capgemini?

Capgemini together with our partner Intel create and deliver innovative cross-industry solutions that transform the customer experience in areas like retail, manufacturing, energy & utilities, transportation and logistics, smart cities and buildings, automotive as well as healthcare. The partnership integrates the latest technologies in AI, VR, AR, ML, predictive and prescriptive analytics and the Internet of Things to generate and apply insights to enhance the customer experience, generate new revenues, reduce costs and improve the bottom line.

Capgemini's world class security accredited XIoT platform leverages Intel® architecture and Intel® IoT Gateways that live at the edge of the end-customer network. The IoT gateways connect sensors embedded in tracked assets to the public cloud, which hosts the Capgemini XIoT platform and the asset monitoring, connected logistics and predictive maintenance applications.

**Best-in-Class Data Security:** The XIoT is the only if not one of the first security accredited IoT platforms that provide end-to-end data security from edge devices to the cloud. Security is managed at each level in the architecture. XIoT is one of the first comprehensive security certified IoT solutions (Edge to cloud) available in the market that's flexible to specific needs across IoT enabled industries.

**Scalability, Agility, and Innovation:** The XIoT platform architecture is based on standardized and open IoT reference architectures. It is capable of connecting millions of assets across the globe. With a defined, repeatable foundation for device connectivity, edge-to-cloud data delivery, and reduced complexity, customers can scale and grow the solution for business agility and continue to innovate on a future-proof platform.

**Flexibility and Accelerated Time-to-Value:** The XIoT platform can host analytics from any source and provides purpose-built accelerators that overcome the barriers of cost and complexity to increase the time-to-value. The XIoT platform offers flexibility to integrate third party components and choose from a myriad of major cloud service providers. The platform is modular to easily integrate separate components such as analytics or big data providers. XIoT can be deployed on a private, hybrid or public cloud.

**Integrated Pricing Model:** The XIoT platform bundles hardware, internet-based applications, and systems integration services and sells the entire solution as a single package. Clients don't have to pay an up-front free to access the platform.

**Value-added Digital Services:** Connected Logistics, Predictive Asset Maintenance and Intelligent Asset Monitoring solutions, both end-to-end offerings, feature more than just the XIoT platform advantages. These solutions also offer cloud-connected digital services that help fully integrate the system across your business processes and maintenance organization.

**End-to-end IoT services:** With our end-to-end IoT services, we guide you through every step of your journey to digital transformation excellence in asset optimization. Our repertoire of services includes IoT strategy, innovation portfolio management, solution design and delivery, rapid concept and design prototyping, and global deployment. With Capgemini and Intel, you can be confident in choosing solutions that are efficient, security-accredited, and focused on driving business outcomes that keep you ahead of your competition.

## Learn more about Capgemini integrated, end-to-end shipment-monitoring solutions

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## For details on the Capgemini XIoT platform, visit

capgemini.com/service/energy-internet-of-things.

## Learn more about the Intel® Connected Logistics Platform

Contact your Intel representative for more information or visit *intel.com/supplychainiot*.

# About
# Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 200,000 team members in over 40 countries. The Group reported 2017 global revenues of EUR 12.8 billion.

Learn more about us at

## www.capgemini.com

People matter, results count.