Supply Chain Asset Tracking

Optimizing the use of returnable/reusable shipping assets

MESH SYSTEMS
An IoT Solutions Innovator

Microsoft
1. Impact of reusable shipping assets not being returned
2. Challenge of getting customers to return reusable shipping assets
3. Introducing Mesh Systems Supply Chain Asset Tracking
4. Ensuring on-time delivery of sensitive chemicals
5. Creating an end-to-end tracking platform with Azure IoT Central
Impact of having to replace shipping assets

10-40%  
Reusable and returnable shipping assets vanish annually with some organizations regularly losing 25%\(^1\)

10-15%  
Surplus returnable shipping assets routinely ordered by OEM to account for loss and shrinkage over time\(^2\)

85%  
Quantifiable savings are attributed to lower expenses by using >1.5 million reusable containers at John Deere factories\(^3\)
Difficulty of boosting the return of reusable assets

**Inability to track assets in real-time**

Challenge of determining in real-time the location and condition of potentially thousands of returnable shipping assets, which could be in-transit, at warehouses and distribution centers, at end-customers’ sites or in inventory, waiting to be filled.

**Misplaced, stolen or damaged assets**

There’s a sizable market for reusable containers, with unscrupulous resellers, recyclers, and “pallet pirates,” profiting from companies that don’t monitor their returnable assets. Additionally, customer might not realize assets are returnable so they might damage the assets or use them for other purposes.

**Reliance on manual recordkeeping**

While aspects of companies’ supply chains are usually digitized, there may be gaps in visibility across shipping and receiving providers, intermediaries, and end-customers who continue to use manual recordkeeping, tracking, and auditing, such as drivers manually verifying delivery and pick-up of cargo.
Mesh Systems Supply Chain Asset Tracking helps expedite the return of reusable shipping assets

- Optimizes use of reusable shipping assets
- Reduces operating and supply chain expenses
- Increases supply chain agility and security
Expedites rapid return and reuse of returnable shipping assets

SIMPLIFIES PROVISIONING
Uses versatile, low power consumption BLE tags, which are quick to install on a breadth of reusable shipping assets: Plastic pallets, totes, containers, racks, and trays

TRACKS INDOORS AND OUTDOORS
Supports tracking and monitoring assets indoors, outdoors, and in-transit from a centralized location or using a mobile app on a smartphone or tablet

GENERATES ALERTS TO ISSUES
Generates alerts and alarms when parameters are exceeded, and provides a customizable dashboard to visualize the flow of returnable assets and real-time status
USES WIDELY AVAILABLE COMPONENTS
Reduces costs by supporting use of widely available, low-cost commodity asset tags, and powers other components using Power over Ethernet (PoE) or solar panels

REDUCES SHRINKAGE
Pinpoints location of misplaced, damaged, or stolen assets, and identified when assets are swapped for those of lesser quality or use for non-shipping purposes

SPEEDS UP RETURN OF ASSETS
Tracks thousands of assets, expediting their return so they can immediately be reused, and pinpoints inefficiencies within supply chain by assessing flow of assets

Reduces expenses by recovering misplaced and stolen assets
Connect your assets at any scale without worrying about infrastructure or security

**PROVIDES HIGH-LEVEL OF SECURITY**
Reduces security risk with BLE Mesh security measures that are mandatory and can’t be disabled, and offers three types of security keys: DevKey, NetKey, and AppKey

**SIMPLIFIES SCALING OPERATIONS**
Makes it easier to track additional assets and types of assets along with conditions within shipping assets by using BLE tags, which are easily provisioned, using a mobile app

**INTEGRATES WITH OTHER SYSTEMS**
Provides secure APIs for integration of asset data with 3rd-party solutions, such as ERP, asset management systems, and other operational and supply chain processes
Ensures on-time delivery of sensitive chemicals

Evonik, one of the world’s leading specialty chemical companies, needed to ensure the timely delivery of temperature sensitive chemicals. Their products help make tires fuel-efficient, mattresses more elastic, medications more effective, and animal feeds healthier.

Mesh Systems provided a turnkey solution, including hardware, mobile application, cloud software, and web-based portal to track their shipments and the condition of these shipments in real-time.

**INCREASED SATISFACTION**
Uses Bluetooth environmental sensors to ensure chemicals are kept at the right temperature and delivered when specified

**SPEED UP RESPONSES TO ISSUES**
Monitors location and temperature in real-time, and triggers alerts and alarms when issues are detected

**SIMPLIFIED INTEGRATION**
Integrates with Evonik’s shipment management systems in SAP, and other third-party and propriety systems

**PROVIDED NEED SCALABILITY**
Created the foundation for larger Bluetooth-based logistics and supply chain tracking and monitoring
Uses Azure IoT Central for end-to-end tracking
Quickly connect thousands of returnable/reusable shipping assets

- Fast and easy set-up
- Build without cloud development expertise
- Connect assets on the edge at any scale
- Best-in-class security and enterprise-grade services
- Full integration into business systems
Start increased the trackability of your reusable shipping assets

→ We’ll connect you with the Mesh Systems asset tracking team to learn how you can quickly provision tracking tags: sales@mesh-systems.com

→ Learn more about the Supply Chain Asset Tracking at mesh-systems.com

→ Learn more about Azure IoT Central at AzureIoTCentral.com
Supply Chain Asset Tracking

Mesh Systems Reference Architecture

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<tr>
<th>Sensors / Connections</th>
<th>Edge Intelligence</th>
<th>Cloud Services</th>
<th>Cloud Intelligence</th>
<th>Mgmt. Experience</th>
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</thead>
<tbody>
<tr>
<td>Our solution helps supply chain organizations increase asset usage and reduce loss by tagging them with versatile BLE beacon tags.</td>
<td>A mesh of easy to deploy, cellular enabled readers detects the tags and sends data to the cloud for real time asset location calculation.</td>
<td>Microsoft's Azure cloud provides a scalable, resilient, secure platform for your asset listing data and for our solution components.</td>
<td>Custom logic modules in the cloud determine each asset's zone and location and prepare data for reporting and ERP integration.</td>
<td>Your team uses Power BI in the browser to quickly find assets they need, see missing assets and drive asset recovery from customers.</td>
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- **BLE beacon tag on each asset**
  - Cost between $5 - $15 per tag
  - Several size options available, default is 2" x 1.5" x 1/8"
  - 3-5 year battery life depending on tag size

- **Up to 20 BLE readers per gateway**
  - BLE gateway on mesh
  - BLE readers in a mesh make anywhere, no special wiring, just 110VAC

- **20M spread, 1200 sq mtr coverage**
  - 50 - 100M range, more w/ BT5 (opt)

- **AZURE IOT CENTRAL with device mgmt/comms, stream processing and storage**
  - Continuous data export to BLOB storage for cold store
  - Azure SQL database from Azure data factory with data cleanup / filter logic

- **AZURE API SITING Powered by Azure API Management**
  - REST API sitting powered by Azure API management

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- **ERP system hourly job to pull asset id / location data**
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- **Power BI built-in and custom dashboards and reports**
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- **Calculate closest reader based on signal strength, determine asset location**
  - Clean up and prepare data for reporting

- **Gateway provisioned before shipping, ready out of the box**
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- **Recent and all-time asset inventory**
  - Real-time asset inventory

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- **Integrated ERP reports for asset location, availability, loss mgmt, etc.**
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- **Shipping asset manager**
  - Shipping asset manager

- **Asset loss prevention mgr**
  - Asset loss prevention mgr

- **Asset analytics mgr**
  - Asset analytics mgr

- **Accounting manager**
  - Accounting manager

- **Operations manager**
  - Operations manager

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**Partnership components**
- Partner component
- Azure service
- Microsoft product

**Product family**
- Pallets
- Totes
- Containers
- Glass racks
- Other supply chain assets