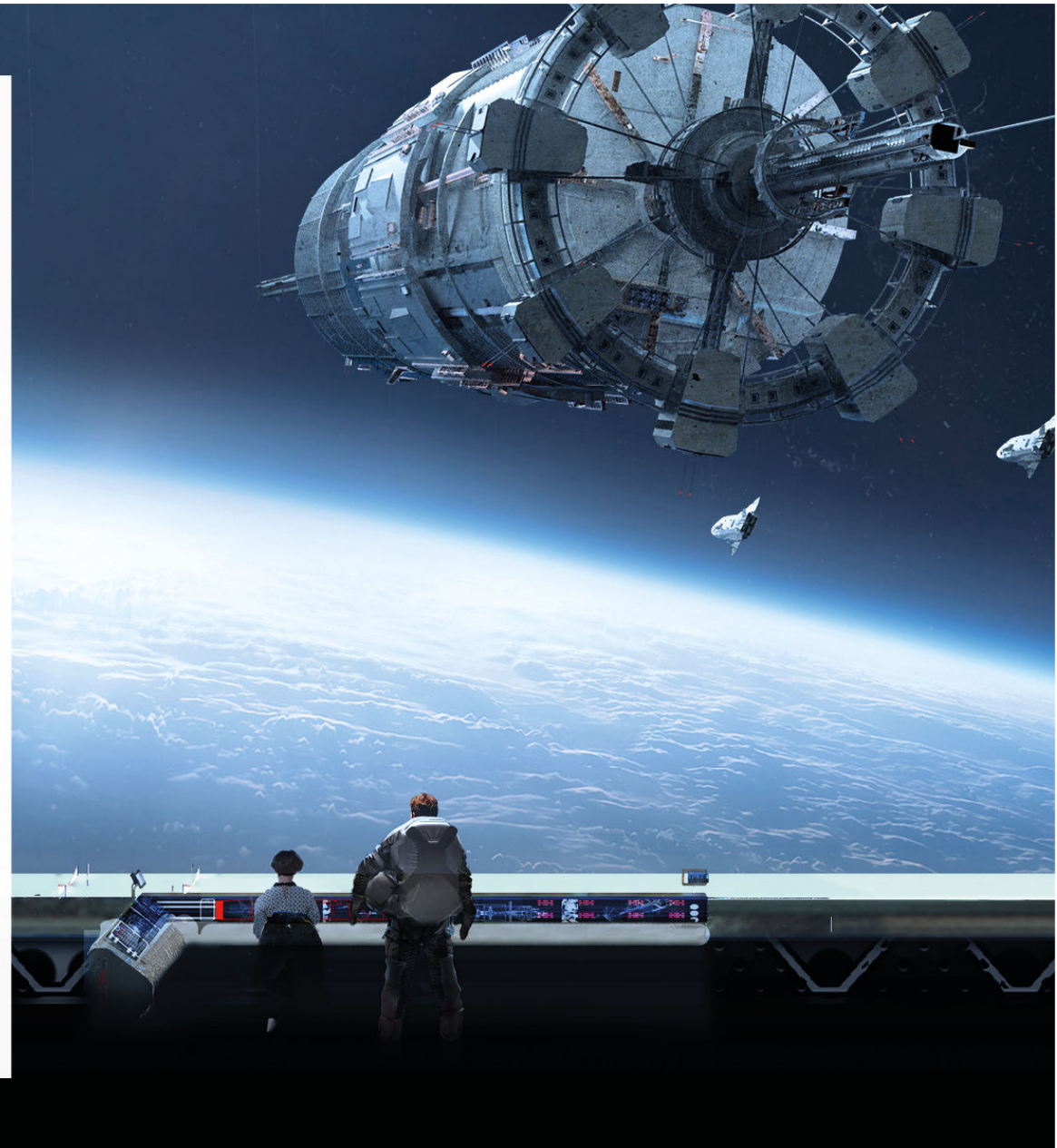


Mike Hetrick
Global VP Sales
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The World of RFID in Logistics

- As the concept and the processes of IoT grow, RFID is more and more a vital and necessary component to any successful data collection system
- The purpose of a digital license plate within the four walls of a factory...a store...a warehouse...or a fulfillment center is to facilitate **CONSTANT KNOWLEDGE** of inventory
- This is a massive amount of continuously flowing data that can **ONLY** be facilitated by RFID and other over the air data collection scenarios...over which passive RFID has certain CLEAR advantages
 - Cost
 - Speed
 - Specificity of read points
 - Accuracy in any environment

In the high speed, modern, digitalized facility, barcode-based systems will become less of a factor

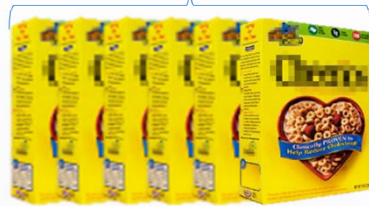


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RFID as a Super Barcode is

- RFID uniquely identifies an item, not just the SKU
- Line of sight not required e.g. read tags inside boxes/containers
- Read at much greater distances e.g. 30 feet

Bar Codes



Define the product (a product SKU)
(but not the instance of that product)

- Read much faster e.g. forty or more tags per second
- You can write or update information on a tag e.g. maintenance count
- Can be embedded inside the product itself (more rugged)

RFID



+ Item specific serial number
123456789....789012



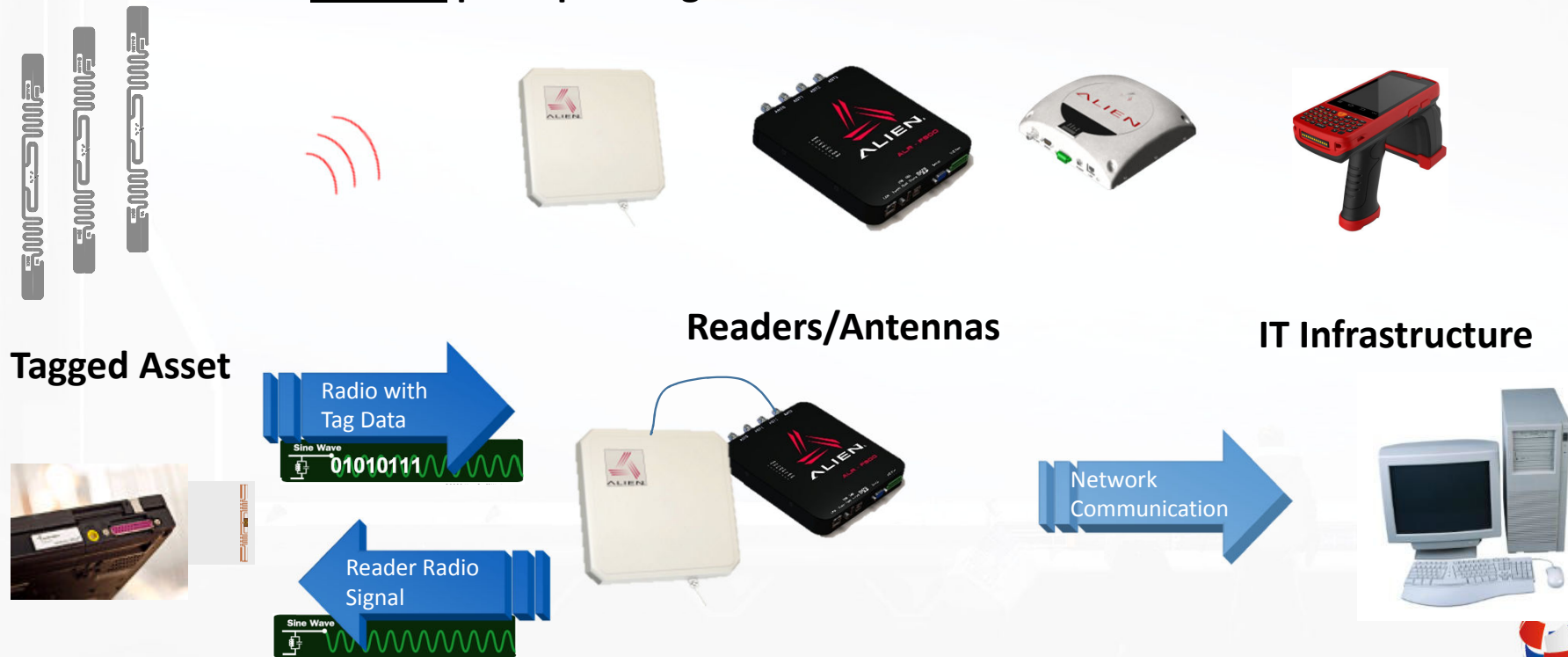
Defines BOTH the product and the specific
instance of that product



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How Does RFID Work?

- Tags/Labels reflect radio signals
- Devices called Readers pick up the signal



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The Benefits of RFID

| | | |
|-------------------|-------------------|--------------------|
| Stock Count Speed | 300 items/hour | 7,000 items/hour * |
| Stock Counting | 1 to 4 times/year | 1 time / week |
| Accuracy Level | 55 to 80% | 97 to 99% |

Barcode

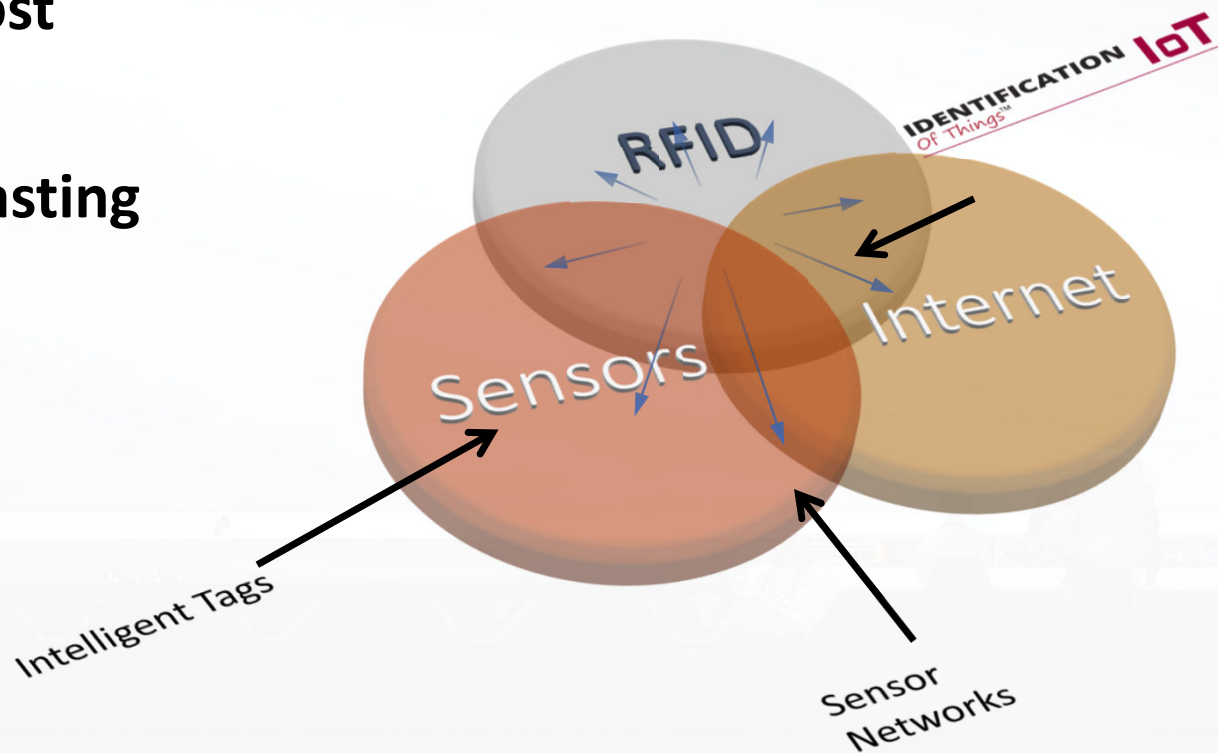


- Less Manual Work
- Less Costs
- Improved Visibility
- Improved Planning
- Visibility of Accurate Real-Time Information
- Fast Locating of Products
- Possibility to Record Losses
- Ability to Plan Product Locations Strategically
- Offers Visibility of Real-Time Stock Movement
- Improves Efficiency
- Increase Accuracy
- Accelerates the Speed of Delivery
- Improves Efficiency
- Increases Accuracy
- Reduces Distribution Costs
- Object authentication

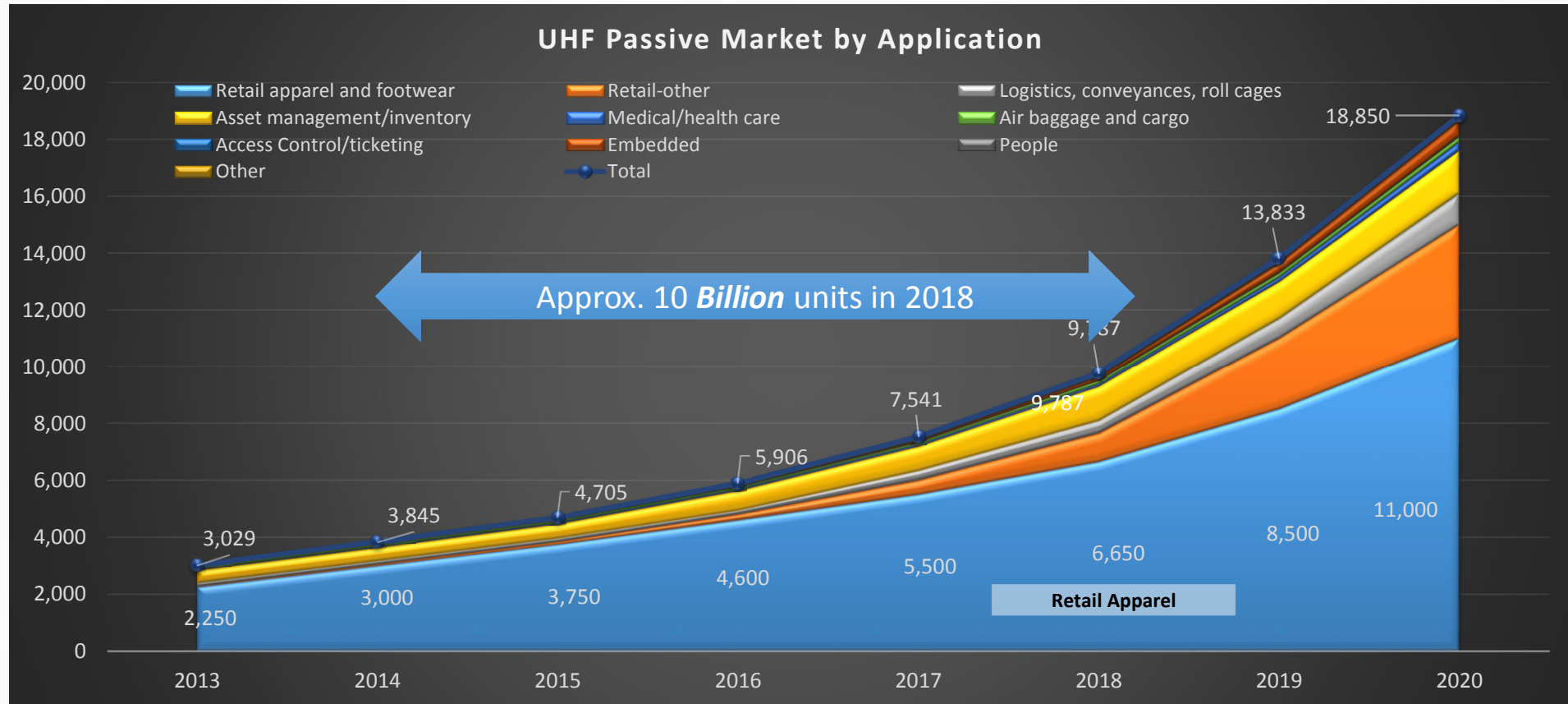


The Benefits of RFID

- Explosive RFID growth is a cornerstone to IoT success
- UHF Passive RFID is the enabling technology for mass-market IoT
- ✓ **Lowest cost**
- ✓ **Robust**
- ✓ **Longest lasting**

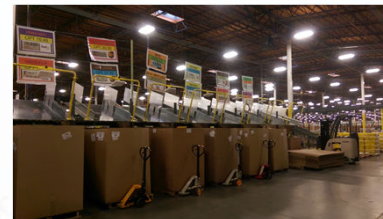
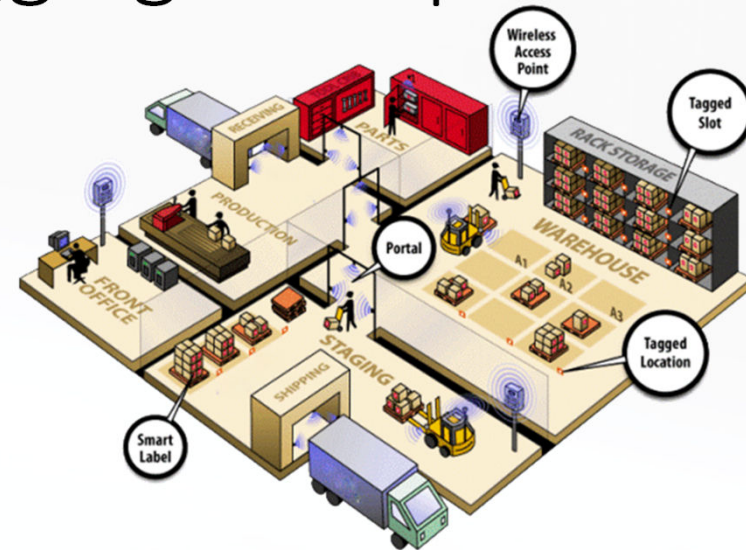


UHF Passive IC/Inlay Growth (Millions of Units)



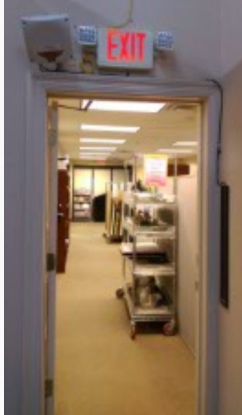
Supply Chain Logistics Tagging Example

1. RFID “Smart” labels Applied
 - products, cases, pallets and other aggregated containers.
 - No line of sight required
2. RFID readers positioned at stations and choke points.
3. Tags are Read
 - As products/pallets move , the reader antenna sends out RF energy and the tag data is read by the antenna.
4. Database Update
 - Data is sent to a database for business analytics, visibility, decision tools, etc.



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RFID in Action



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Three Things to Remember...

- Passive RFID (“RAIN” RFID) is primarily a tracking technology, and not a location technology
 - It creates excellent accuracy on inventory in transit when used to track items from choke point to choke point using fixed reader technology with no human intervention
 - It creates excellent accuracy on static inventory (shelves and racks) using handheld readers or forklift-mounted fixed readers
 - If you are looking to LOCATE items within a tight tolerance (within a 10 foot box inside a 50,000 square foot warehouse), then passive RFID is not a good technology fit, from either an economic or an efficiency standpoint
- Once a process flow and read points are defined, tag selection is THE most critical factor in a successful implementation
 - Read range is largely determined by the tag, and not the reader
 - Tag designs are meant to maximize read rates on specific materials at specific distances
- Your expectation should be 99% read rates
 - Empowered by ever-improving IC design
 - Fulfilled by the right tag design
 - Ensured by the right reader, installed correctly



Thank You!



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