CONNECTIONS SUMMIT

RAIN, Cloud & the Chained Twin

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Suppose You Wanted to Connect Every Item in Your Everyday World

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You'd First Ask *Why*?

To connect people and businesses to items

- To identify, locate and authenticate each physical item
- To store and access each item's history, ownership and available services in an item's digital twin

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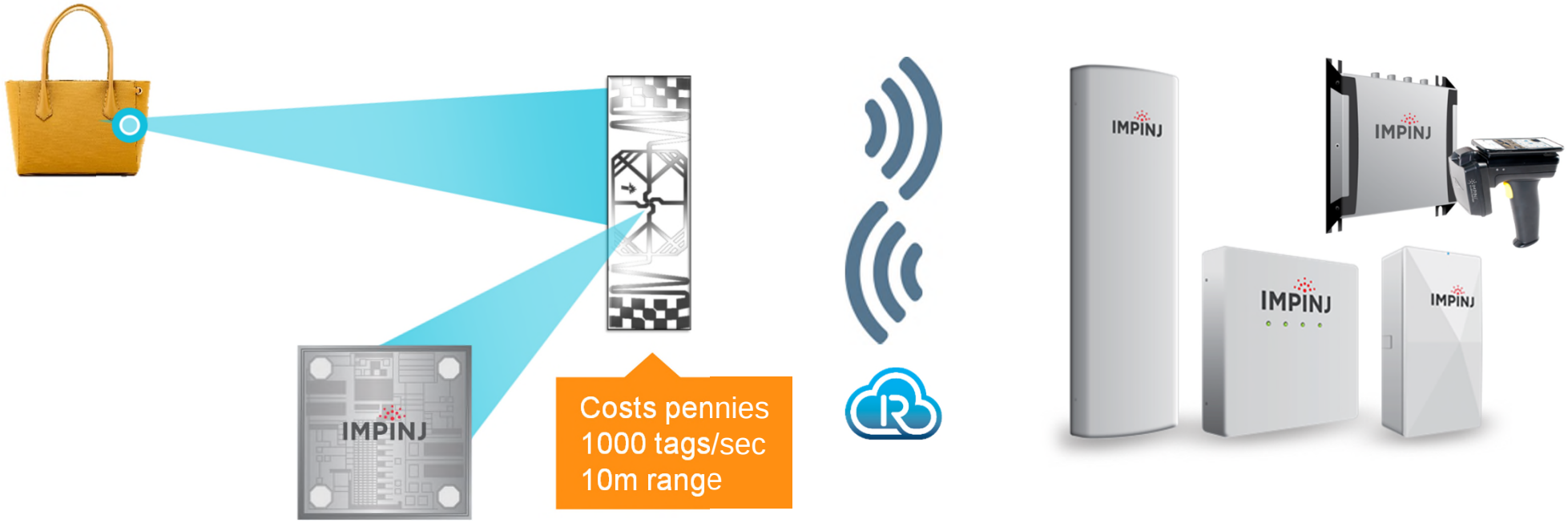
Then You'd Ask *How?*

You'd use a wireless technology suitable for connecting items

- No batteries
- Unlimited life
- Fast & long range
- Small & low cost
- Unique identifier on every item
- You'd call it **RA**dio **I**dentificatio**N**

RAIN RFID



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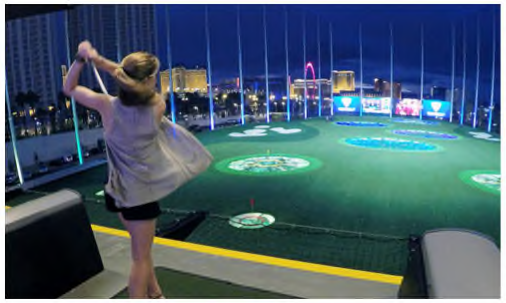
Am I For Real?

A few of the **billions** of items (or things) already connected



Yes, I'm for Real

- Increase Store Efficiency
- Improve Customer Experience

DECATHLON ZARA (1)

- Reduce Lost Baggage
- Speed Bag Offloading

BOEING DELTA

- Identify / Track Vehicles
- Fast, Cashless Fueling

VOLVO Audi

- Streamline Operations
- Ensure Quality

Coca-Cola

- Track Assets
- Enhance Security

WELLS FARGO intel

- Automate Drug Tracking
- Improve Asset Utilization

DeRoyal Hanmi

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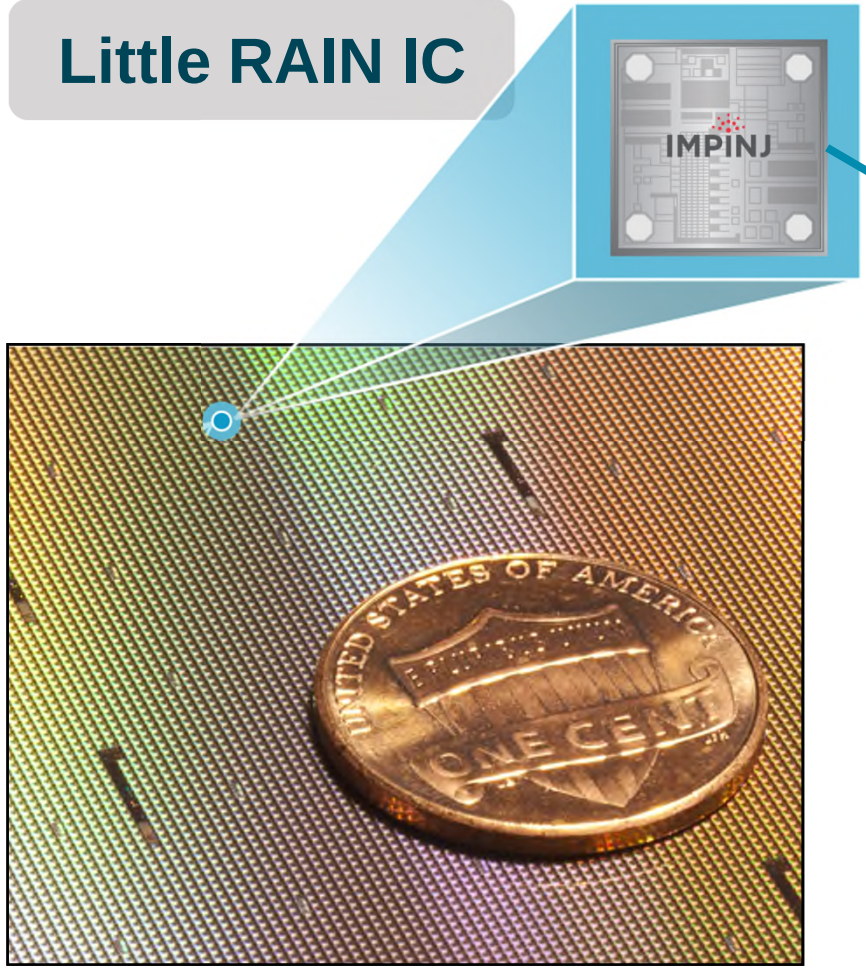
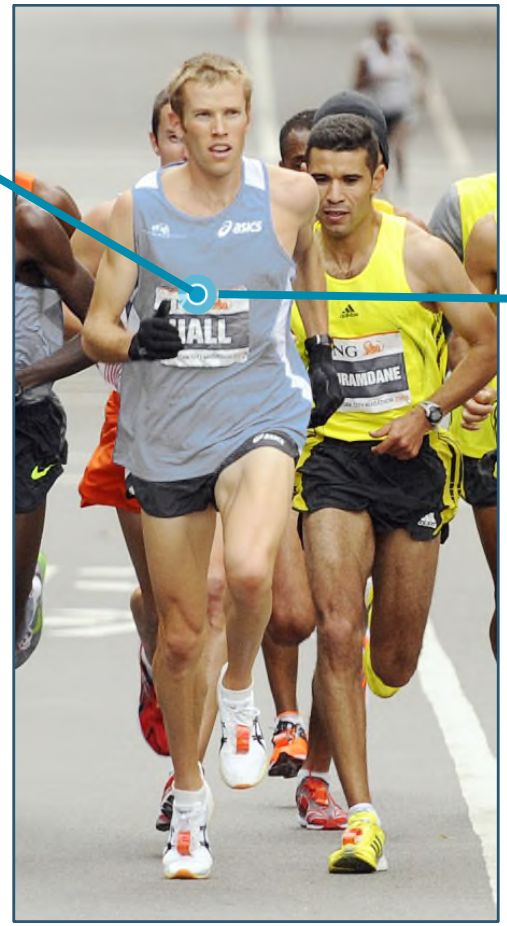
(1) These RAIN programs may, but do not necessarily, use the Company's products.

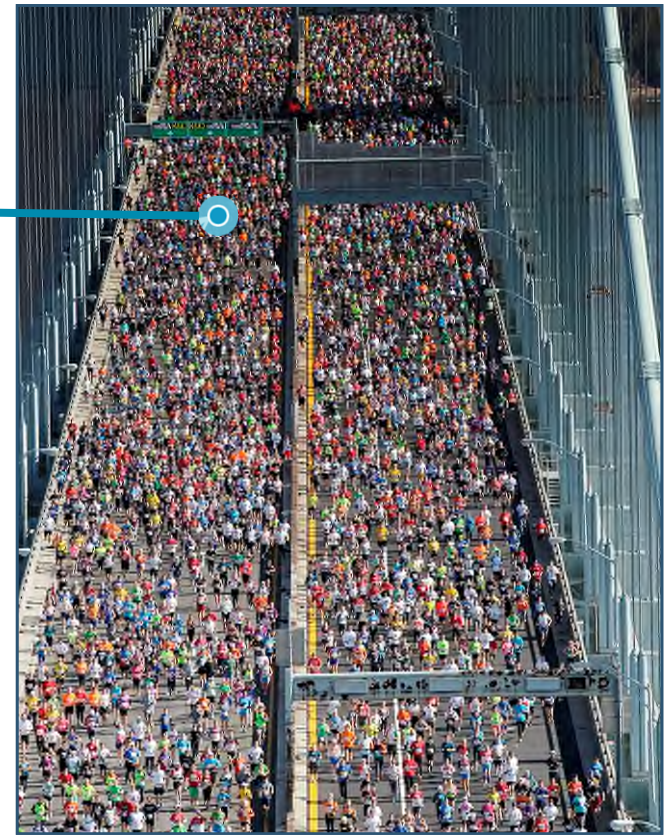
The True *Internet of Things*

Little RAIN IC





Big Opportunity



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Linking the Physical and Digital Worlds

Physical items have digital twins

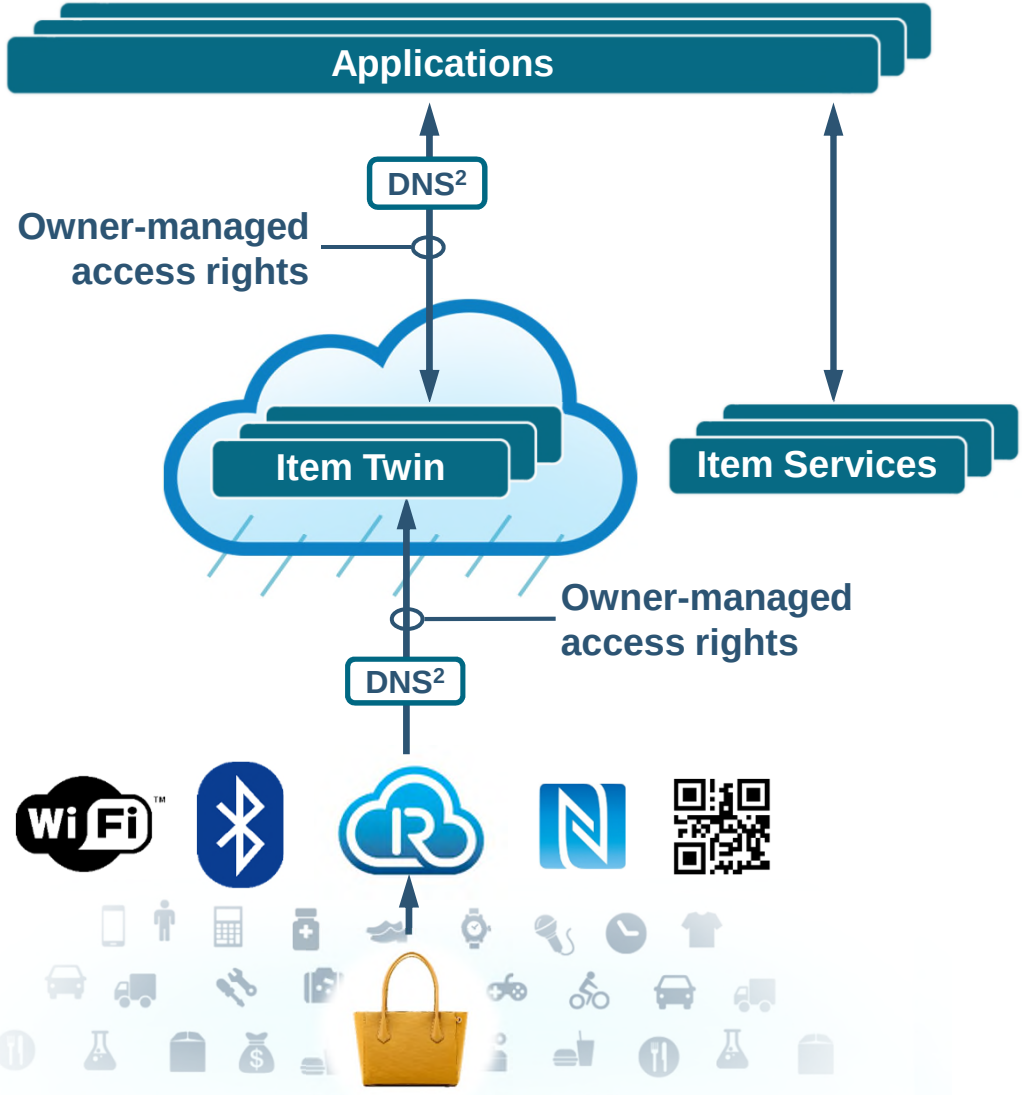
- **Twin:** *in the cloud*
- **Item:** *in my possession*

I own both the item and its twin

- **Twin:** *my access rights*
- **Item:** *my owner rights*

I benefit from the item's digital life

- **Twin:** *ownership, history & available services*[1]
- **Item:** *identity, location & authenticity*



1. *An example of a service is counterfeit detection/avoidance*
2. *DNS is a metaphor for discovery to resolve item identities to URIs*

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Deep-Dive Example

ITEM'S DIGITAL LIFE

Origination → Contract Fulfillment → Routing → Contract Fulfillment → Management → Item Sale → Receipt

Transaction Receipt

Unique Identity

Brand Protection

Automatic Restocking

Self-Checkout

Shipment → Receipt → Shipment → Receipt → FSBS → Fitting room → Checkout

Manufacturing | Warehouse | Backstore | Store Floor

MANUFACTURER | DISTRIBUTOR | RETAILER | PERSON

ITEM'S PHYSICAL LIFE

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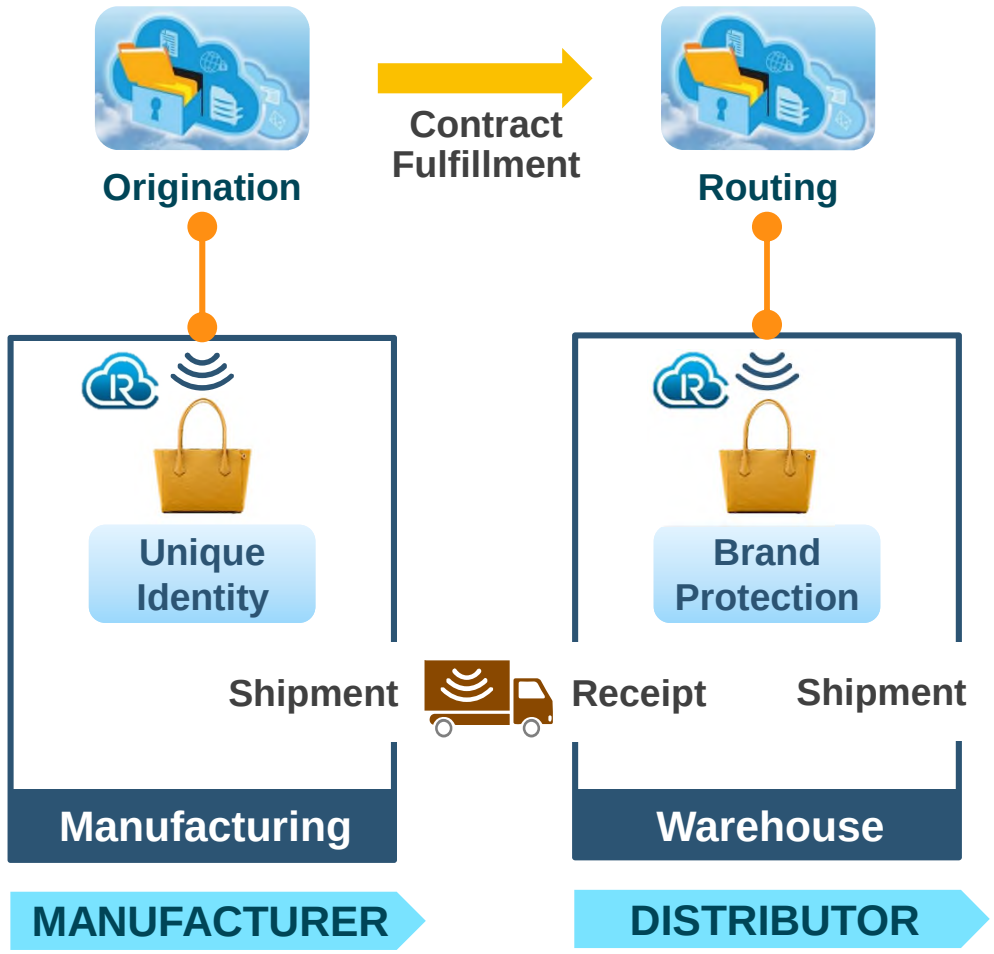
Authentication and Chaining



- **Manufacturer**
  - Associates RAIN identifier with cloud-based twin
  - Stores detailed manufacturing data in twin
    - Grants retailer access to some item data
    - Grants consumer access to warranty
- **Shipper**
  - Automatically fulfills transfer contract
    - Hash-chains ownership transfer
    - Authenticates item as genuine
  - Stores shipping/routing data in new twin
    - Grants retailer access to shipping/routing data
- **Distributor**
  - Automatically fulfills transfer contract
    - Hash-chains ownership transfer
    - Authenticates item as genuine
  - Stores receipt & location data in new twin
    - Grants store access to item availability

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Progress Towards the Vision

In Progress – Item Connectivity

Reading

Identification

Inevitable – Digital Life for Items

IoT Opportunities

1. Digital life for physical items
2. People engaging connected items
3. Developers innovating an IoT ecosystem

What We Must Deliver

1. Discovery service that resolves item identifiers to twins
2. Authentication service(s) that ensures physical items are genuine
3. Standardized ownership, privacy and data rights/privileges for twins

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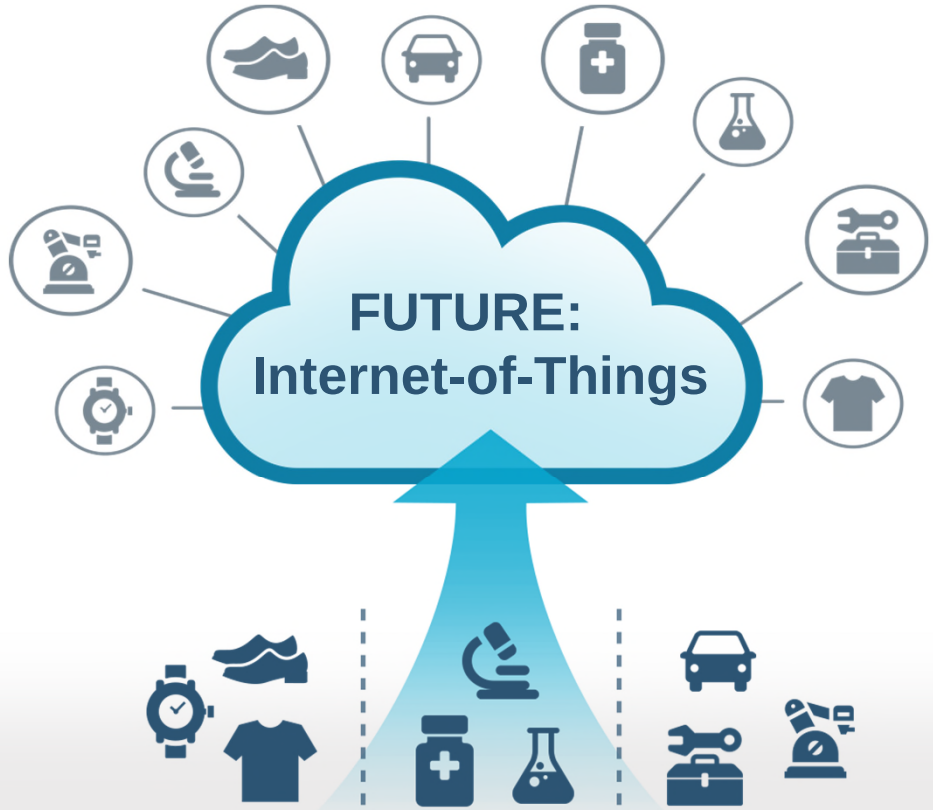
History as a Guide

Internet Evolution

PAST: Private Networks Era

IoT Expectation



TODAY: Private Networks of Things

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RAIN will Better Our World

Driving people-friendly branding is essential to this IoT vision

– RAIN connects everyday items to the cloud –

RAIN™

Mission

To enable businesses and consumers to identify, locate, authenticate and engage items in our everyday world

Vision

A future where everyday things are part of a connected world

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DIGITAL LIFE FOR EVERYDAY ITEMS

THANK YOU