Sun Microsystems & RFID

• What is Sun doing in RFID?
  – Sun's systems approach to RFID includes:
    • Software – Sun Java System RFID Software
    • Hardware – Middleware platform
    • Systems Architecture
    • Services and Test Centers
    • Best-of-Breed Partnerships
    • World-class support
What's Driving RFID Today

- **New Technology**
  - Smaller & Better Chips

- **New Standards**
  - Auto-ID Center/EPC Global
  - The Internet

- **New Economics**
  - New Manufacturing Processes

- **Industry Mandates**
  - Wal-Mart, US DoD etc.

Smaller, Cheaper & Better RFID Tags are driving new applications
Industry Usage of RFID

Consumer Product Manufacturers

Retail

Aerospace

Defense

Pharmaceutical

Livestock

1 Trillion!
RFID Users have many Questions

- RF Basics: Tags, Readers, RF physics, Regulations?
- Standards: What Technologies should I use?
- Scalability: How do I start small and then go big?
- Reliability: Will it work in an enterprise setting?
- Manageability: How do I manage the infrastructure?
- Security: What are my security considerations?
- Business: What will this cost? How long to ROI?
- Partners: Who should my trusted partners be?
Real World RFID Requirements

Roll Cages

Metal wire frame cage on wheels for moving inventory between Distribution Center and Stores.

Two single dipole ruggedized tags attached to each rollcage
Real World RFID Requirements
Luggage Tag and Reader
## Real World RFID Requirements

### Tire Orientation

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conveyor</strong></td>
<td><strong>Rolling through a threshold</strong></td>
<td><strong>Rolling through a threshold</strong></td>
<td><strong>Pallet (arranged) through a threshold</strong></td>
<td><strong>Pallet (arranged) through a threshold</strong></td>
<td><strong>Pallet (arranged)</strong></td>
<td><strong>Stacked on horizontal racks</strong></td>
<td><strong>Stacked stovaped on floor</strong></td>
</tr>
<tr>
<td><img src="image1" alt="Diagram" /></td>
<td><img src="image2" alt="Diagram" /></td>
<td><img src="image3" alt="Diagram" /></td>
<td><img src="image4" alt="Diagram" /></td>
<td><img src="image5" alt="Diagram" /></td>
<td><img src="image6" alt="Diagram" /></td>
<td><img src="image7" alt="Diagram" /></td>
<td><img src="image8" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>Overhead mounted reader</strong></td>
<td><strong>Dock door reader - sides</strong></td>
<td><strong>Dock door reader - header</strong></td>
<td><strong>Dock door reader - sides</strong></td>
<td><strong>Dock door reader - header</strong></td>
<td><strong>Handheld reader</strong></td>
<td><strong>Handheld reader</strong></td>
<td><strong>Handheld reader</strong></td>
</tr>
<tr>
<td><strong>500 feet per minute</strong></td>
<td><strong>500 feet per minute</strong></td>
<td><strong>500 feet per minute</strong></td>
<td><strong>500 feet per minute</strong></td>
<td><strong>500 feet per minute</strong></td>
<td><strong>Static</strong></td>
<td><strong>Static</strong></td>
<td><strong>Static</strong></td>
</tr>
</tbody>
</table>
Real World RFID Requirements “Project Sun Beam”

Antennae

Console

Boundary
What is an RFID Test Center?

Test Center Environment
- 17,000 Sq. Ft Warehouse
- Dock Doors for Receiving and Shipping
- High Speed (600ft/min) Conveyor System
- Pallet Conveyor and Forklift
- Multi Reader and Tag testing
- Fully Operational

Benefits to RFID Users
- Understand RF Issues
- Off premise testing, lower risk
- Real-world simulations
- “One stop” technology shop

Scotland
Texas
Taiwan
Observations

- RFID Tagging (UHF) more of an art than a science – passive tag technology temperamental under current power, duty cycle requirements
- Adoption of UHF technology in Europe has lagged the US, primarily due to restrictions and incompatibilities
- International Standardization of frequency, power settings, duty cycle, etc. would drive down costs and lead to mass adoption
Thank You!

Questions?