

# METI Policy on RFID Promotion

**May 2006**

**Information Economy Division,  
Ministry of Economy, Trade and Industry**



# Considerable potential for growth in RFID

- ◆ Solution to global policy challenges
- ◆ “Killer app” to manage and solve business resource problems such as economic structural changes, industrial structure changes, and market structure changes
- ◆ Quick solution to a lack of volume and quality in information technology investments
- ◆ Seamless integration to existing economic activities

## The potential superiority of RFID

### Ease of Use

Consumers and salespeople  
Can use it without training

### Format Free

- Integration between systems
- Effective utilization of existing assets

### Technology Neutral

Continuing investment in R&D

- integrated manufacturing and sales systems
- integration of commercial distribution and physical distribution
- Integration of the flow of physical items and the flow of contract and management information

**Getting over the bottleneck for investments in IT,  
Serve as a foundation for a true “IT world”**



## The key-concept of RFID

- ① Ensuring of consumer interests
- ② Expand the business opportunity for small and medium enterprises
- ③ Economic revitalization through business facilitation



Action



**RFID field trial Projects**

# Promotion of Industry Field Trials



## RFID field trial Projects

**FY2003**

**2 million \$**

- 4 industry area
- UHF RFID Tags were used for the first time in Japan

**FY2004**

**15 million \$**

- 7 industry area
- Business models using RFID tags in each area

**FY2005**

**15 million \$**

- 8 projects
- ROI (Return on investment)
- Know-how tips on using RFID Tags in business process
- Reliability  
Operation and Technology



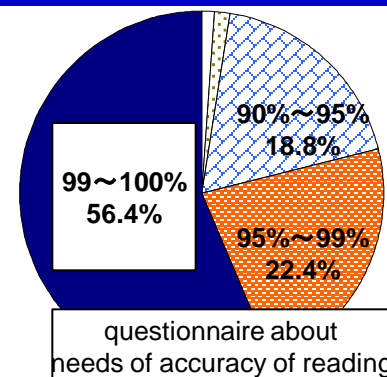
# RFID performance limit due to radio properties

## ◆ Reading rate 100% are preconditions for utility use

- Reading impossibility causes customer complaints and reduced public faith.

## ◆ Performance limit of RFID due to radio properties

- From the viewpoint of radio properties, we can never read RFID in environment of metal / water.



## Realization of highly reliable RFID system by supplementing technology with operation standards

### Measures of an operation aspect

- ◆ International standardization such as operation rules based on results of the field trial projects

### Measures of a technical aspect

- ◆ Examination of a combination of various data carriers

- 13. 56MHz, UHF, bar code, etc



# Operational procedures to improve reliability

## (Pharmaceutical Products)

### Issues

Low accuracy of reading, because medicines overlap

### countermeasures

Use of a plastic case to prevent overlap



Reading impossibility

Medicines don't overlap  
by using a plastic case







# Operational procedures to improve reliability

(Home Electrical Appliances and Electronic Products)

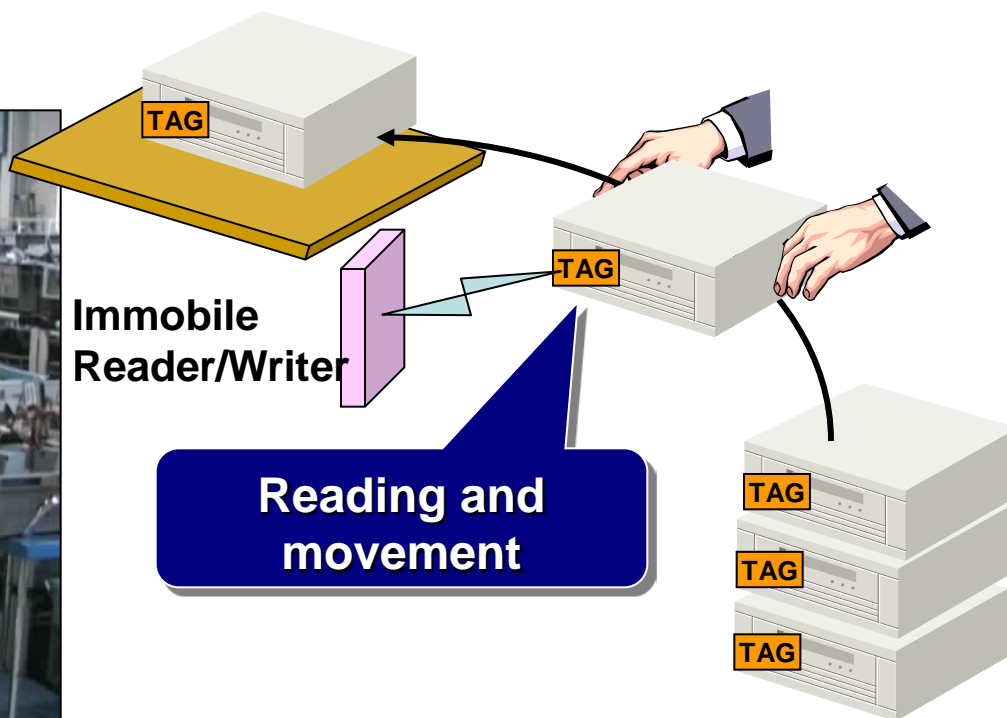
**Issues**

Decreased operating efficiency by addition of a read operation

**countermeasures**

Read RFID tags without changing workflow

Fixed Reader/Writer





# Future direction

# The direction of policy on RFID Tags

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- **Increase of the number of companies using RFID and promoting trial projects**
  
- **Regal infrastructure**
  - **Creation of rules for the treatment of privacy issues.**  
(MIC and METI / June 8, 2004)
  
- **Economic infrastructure**  
(make effective use of an existing system)



**Basically, Initiative by private sector,  
Harmonization with industrial activity**

# The direction of policy on RFID Tags

## ○ *Economy and reliability*

- For low price merchandise, for disposable use
- Free from Digital-Divide barrier with expanding use of RFID  
(small companies and less-developed countries)
- Durability for daily, repeated, continuous handling  
(various players use RFID tags under various situations)
- Many tags, Many Reader/Writers



**Importance of system supply according to economy and reliability**

- High reliability with actual results/Hibiki tag
  - The  $\mu$ -chip (by HITACHI) has already achieved sufficient reliability
- Performance limit of RFID by wireless technology
  - Highest reliability RFID system will be realized by interaction between guideline and technology

*Contribution to International Standard*

# New liaison activities

- Harmonization with industrial activity
- Contribution to International Standard

## <The background>

- ★ According to the chairman's message on SC31 News letter, Japan would like to contribute to the liaison between SC31 and TC184/SC4.
- ★ Promote the adoption of RFID ISO standard in industrial automation field(ISO/TC184).

## <First step>

The Ad-hoc WG on RFID Middleware was established in January 2006.

## <Next step>

Expand the liaison with other application fields.

# To promote the adopting the RFID ISO standard in industrial application.

## 1.<Japan's concept of proposal on middleware of RFID interrogator>

- ★Promote the adoption of ISO/IEC15961/15962 and 24752 in industrial applications.
- ★To add the extensibilities and flexibilities to current standard through providing the profile box in the middleware side.

## 2. <The user requirements for 15961/15962>

- ★The 15961/15962 is fine and will be acceptable in some applications but it has many functions in Interrogator side.
- ★In different applications like Factory Automation, the interrogator's software is required to change due to the user requirements. But there are many impossible cases to change the software of each interrogator. In general it is easier to change the software of middleware of the host computer instead of interrogator's.

## **To promote the adopting the RFID ISO standard in industrial application.**

### **3. <How to solve >**

- ★ To add the selective function by profile box to middleware so that user can select the middleware based system or interrogator based system.**
- ★ The many different requirements in different applications will be solved by this function and 15961/15962 will be adopted in various application fields.**

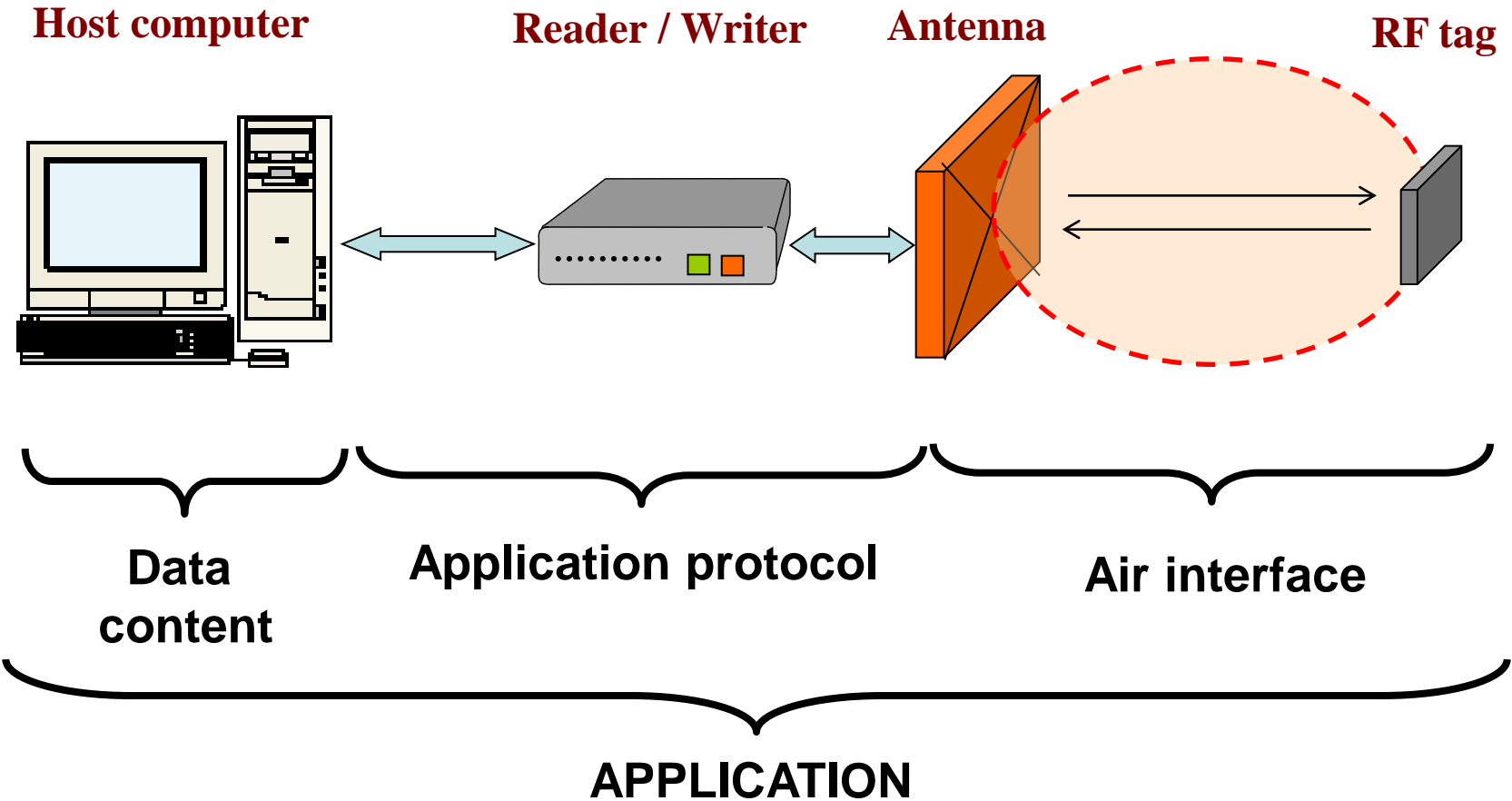
### **4. <How to contribute>**

**In industrial Automation segments, many users have started to implement the RFID system.**

**Japan would like to promote to develop ISO standard by submitting NWI proposal on 24752.**

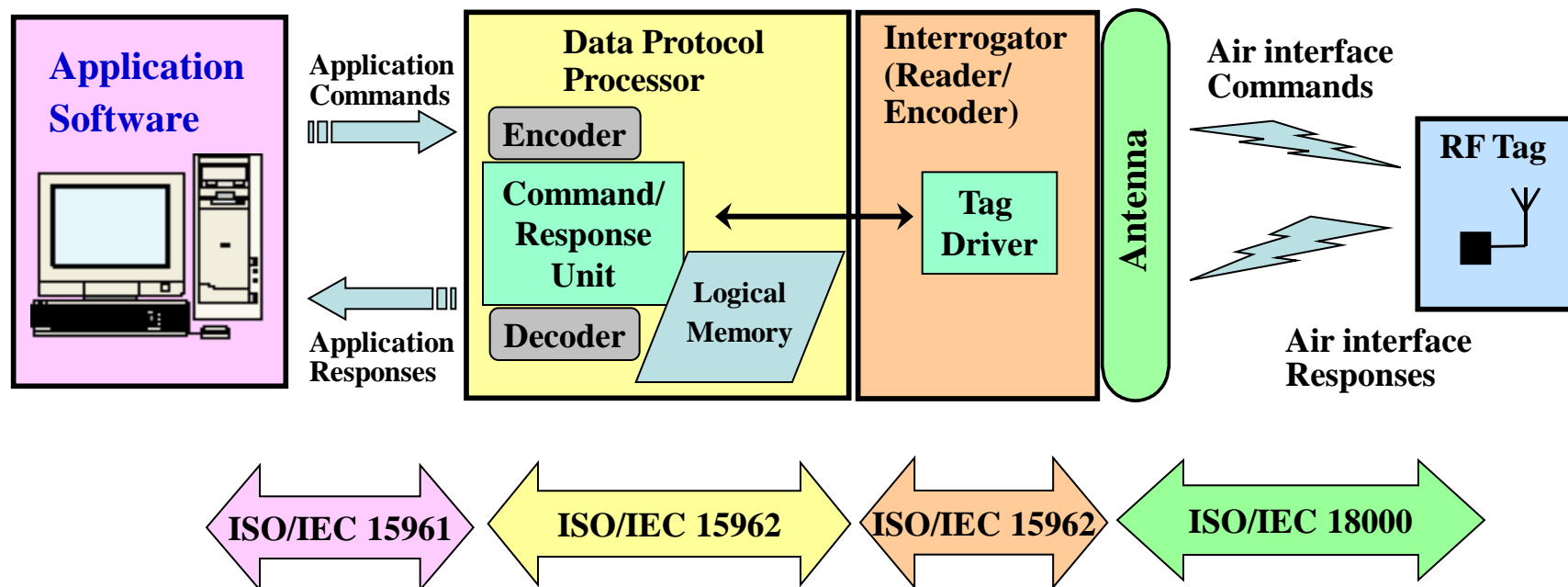


# RFID System ,The Generic Model



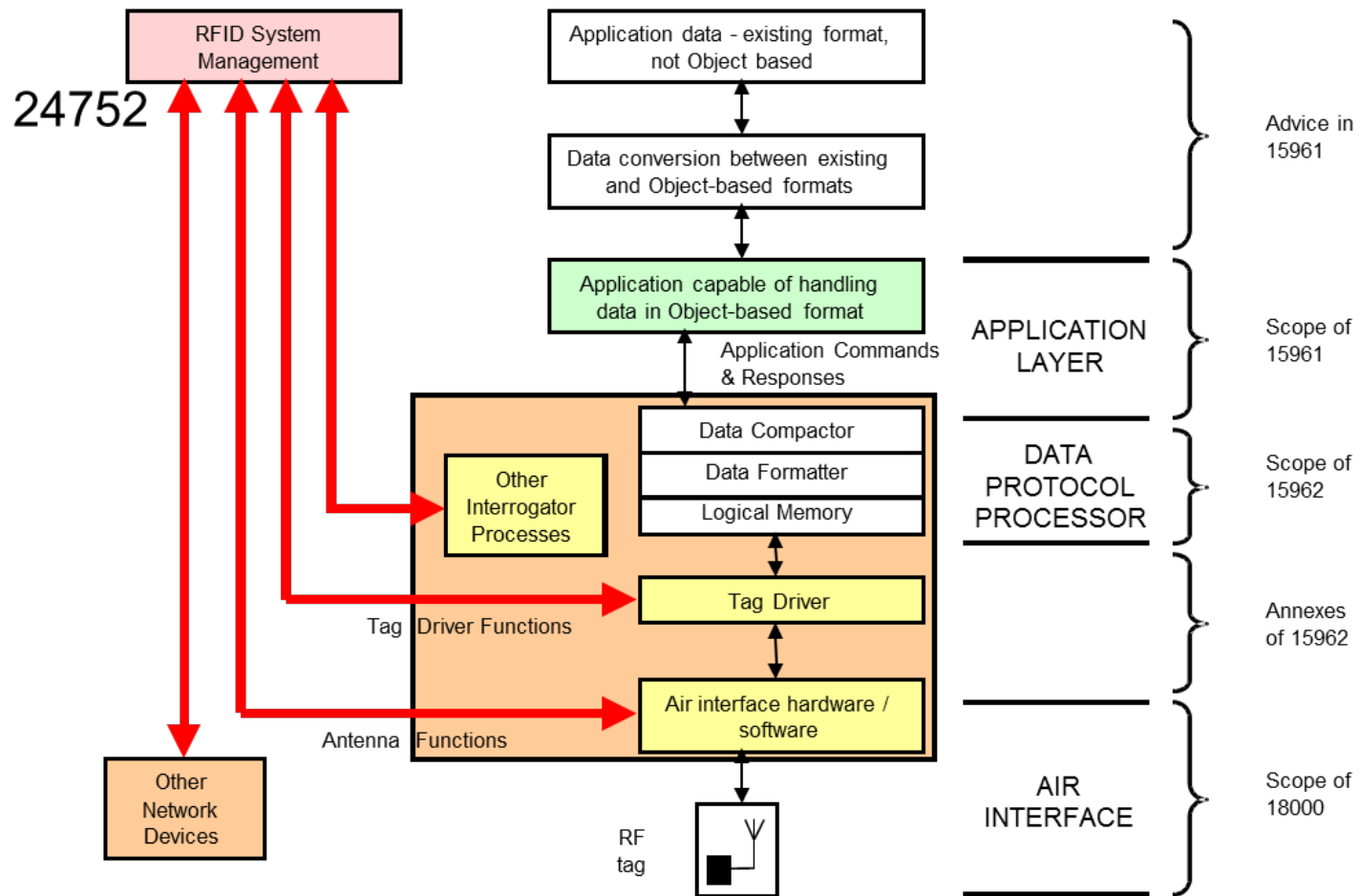
Refer to WG4/SG1 documents

# RFID Data Protocol positioning ISO/IEC 15961 & 15962



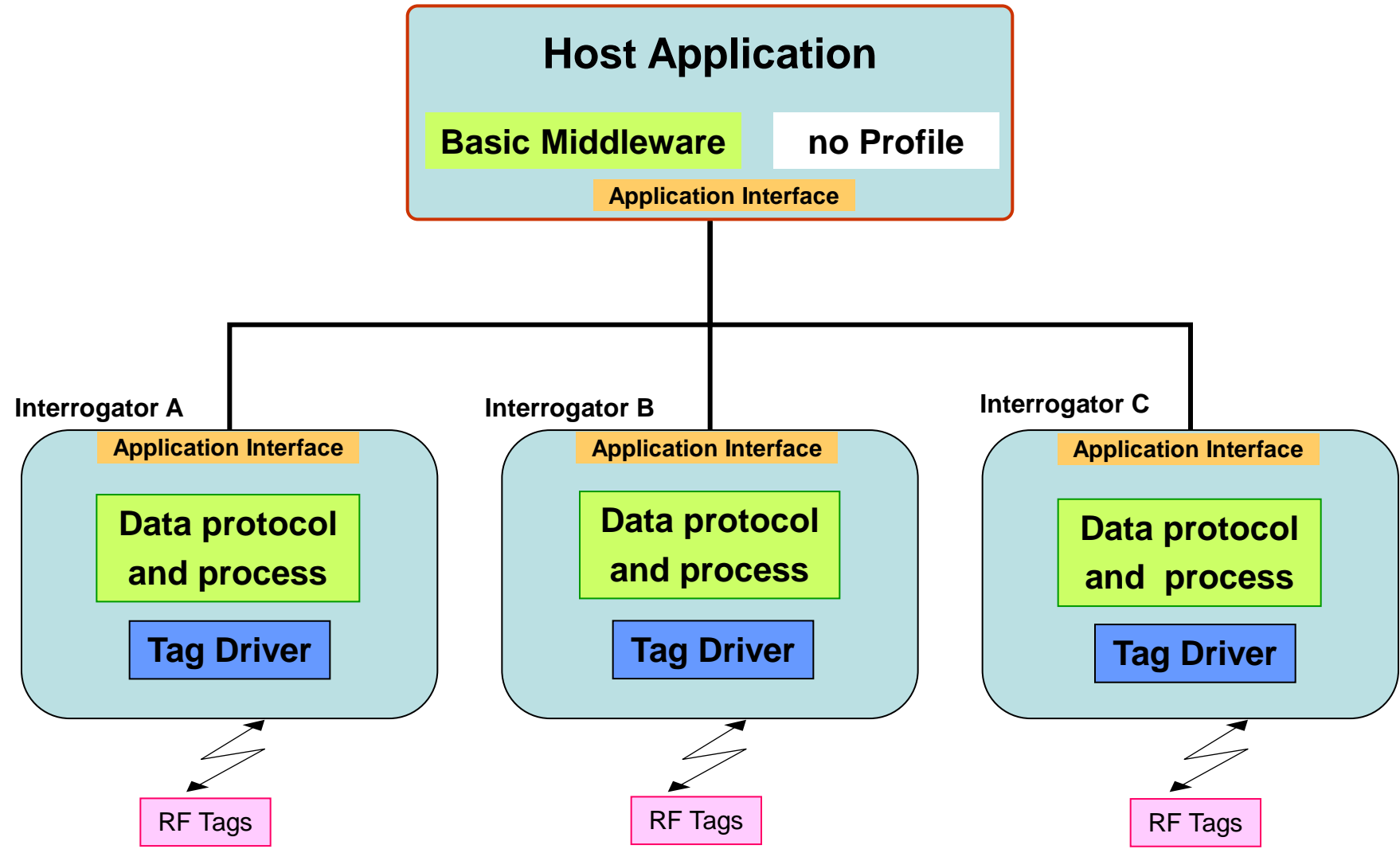
Refer to WG4/SG1 documents

# The original scheme of ISO/IEC 15961/15962 and 24752

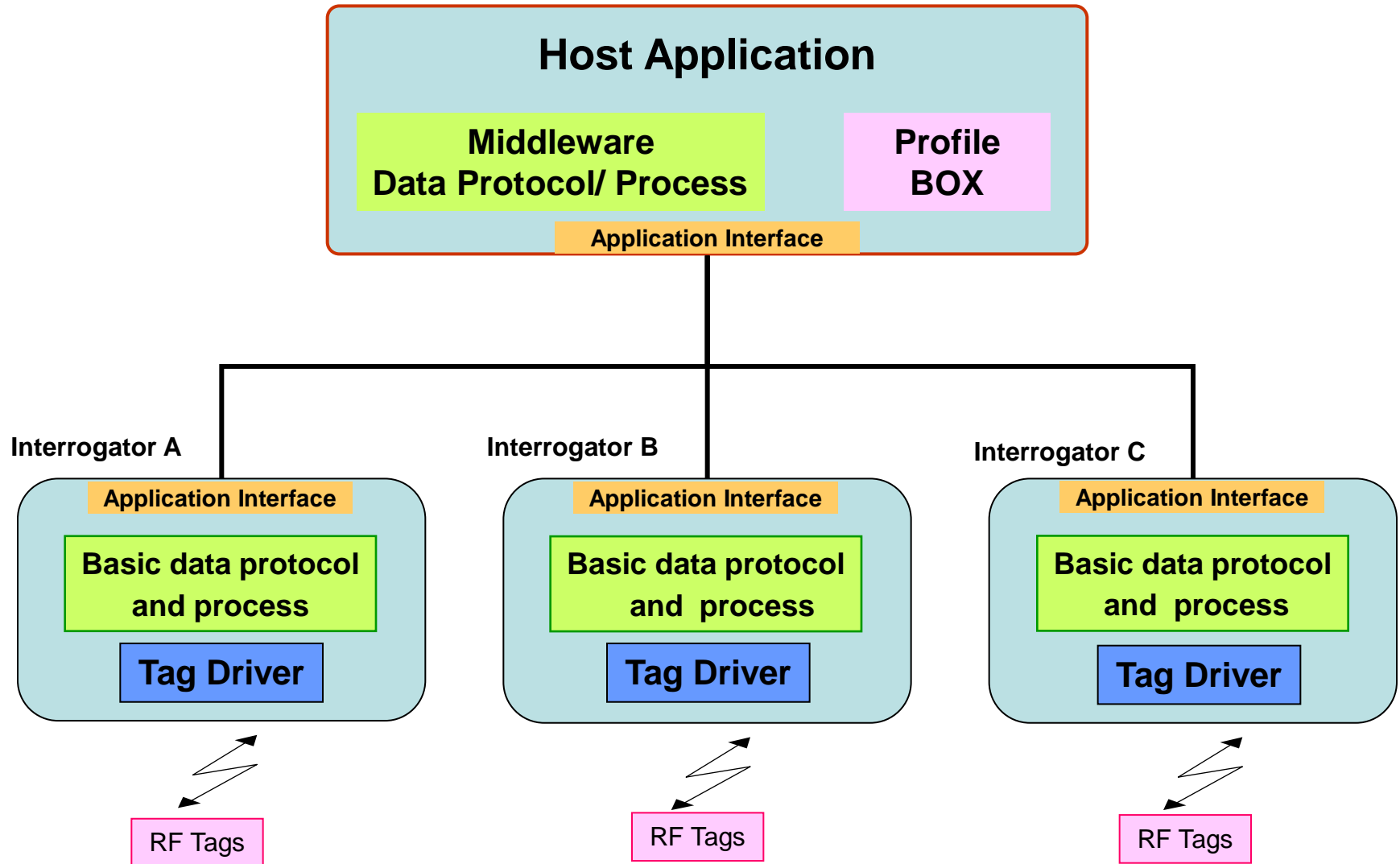


Refer to WG4/SG1 documents

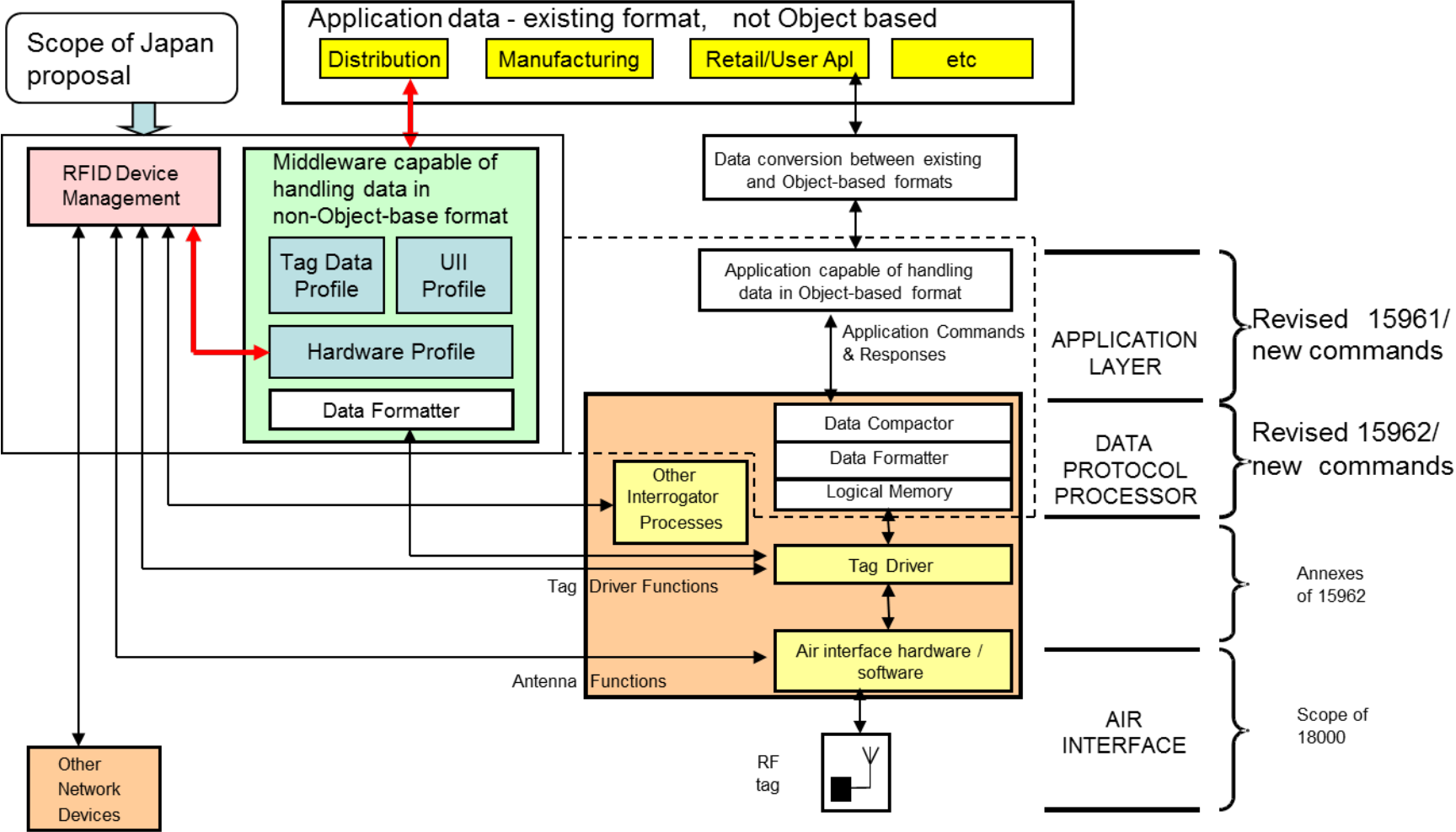
# Data management Architecture based on current RFID Interrogator system



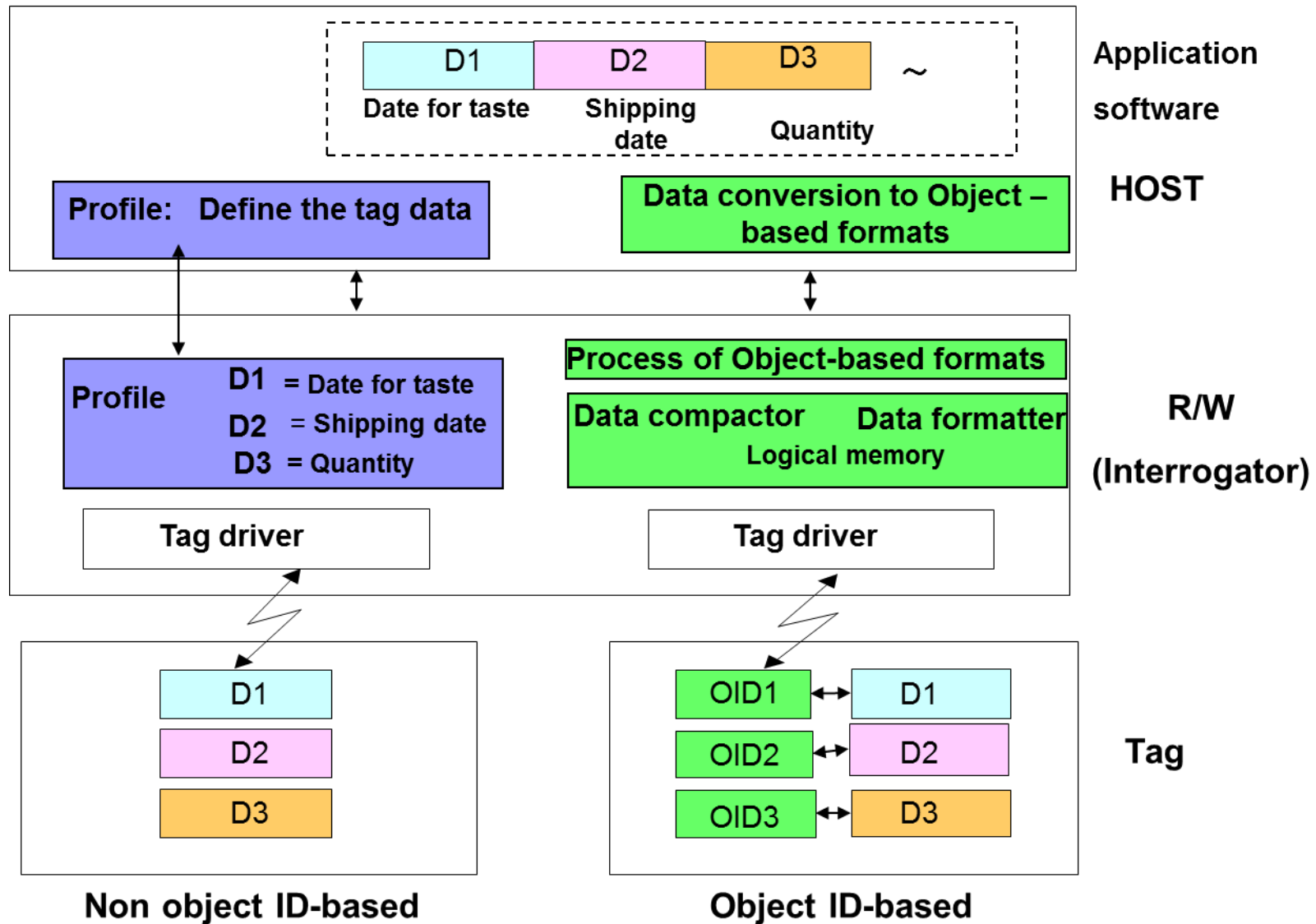
# Data management Architecture based on Middleware with Profile box



# A draft new scheme on Middleware with profiles



# The comparison of Object ID system (15961/15962) with Non-Object ID system





# References



# Promoting the Field Trial Projects in industries

- RFID Field Trial projects are conducted in multiple industries.
- The improvement of supply chain is studied in each industry.

**FY2003**

4 industry area.

Project	Test Location
<b>Electric Home Appliances</b>	Factories Distribution Centers Retail Shops
<b>Apparel</b>	Factories Distribution Centers Retail Shops
<b>Publishing</b>	Distribution Centers Book Shops
<b>Food</b>	Distribution Centers Super Markets

Since March 9, 2004, the first UHF RFID tests in Japan were done in actual factories, distribution centers and retail shops. Comparison test between UHF and 13.56MHz / 2.4GHz was also performed.

**FY2004**

- To be extended to 7 industry area.
- UHF RFID was tested in all projects

Project	Test Location
<b>Electric Home Appliances and Electronic Equipments/Devices</b>	Factories Distribution Centers Retail Shops
<b>Construction Machineries, Industrial Vehicles and Agricultural Machineries</b>	Parts Factories Assembly Factories Dealers
<b>Publishing, Book stores and Libraries</b>	Factories Distribution Centers Book Shops Libraries
<b>Medical and Pharmaceutical Products</b>	Factories Distributors Hospitals
<b>Department Stores and Apparel</b>	Factories Distribution Centers Department Stores Retail Shops
<b>International Marine and Land Container Transportation</b>	Ports (Marine Container)
<b>CD/DVD Media and Retail/Rental Stores</b>	Factories Distribution Centers Retail Shops Rental Shops



# Results of the FY2003 Field Trial projects

## Results of the Field Trail project cases as an example.

Radio wave Shield-room	Performance of 950-956MHz band reader/writer was examined. Satisfactory performance of tags tuned in US 915MHz, with a reading range of around 3 to 5 meters.						
Actual business field	Excellent performance of UHF band RFID tags in terms of a reading range, run-round, accuracy of read information (depending on where tests were conducted).						
	Ref.: Home Appliances Industry Pilot Projects	Readability rate through Forklift		Detection rate by Shoplifting prevention gate		Readability rate of products arranged on the shelves	
			Average readability rate	Walk-through (at 4km/h)	Run-through (at 8km/h)	Rate	When boxes piled When tagging on the opposite side
		UHF	98.9%	100%	100%	99.1%	○
		2.4GHz	79.0%	60%	0%	97.3%	×
		UHF: Passing speed 36m/minute 2.4GHz: Passing speed 7.5m/minute		UHF: Gate width 1.6m 2.4GHz: Gate width 1.1m		45 small items were arranged. Rate indicates an average of figures measured 5 times.	



# Results of the FY2004 Field Trial projects

- ◆ **“Economy” is the generation of added-value through the flows of information, goods and services. RFID tags are a technology that facilitate these flows, and which achieve optimization of the whole economy.**
- ◆ **Accordingly, the assessment of RFID tags, is that they possess the ability to extract the greatest value from economic and industrial activities.**

Industry	Outcomes of the Field Trials (compared with barcode operations)
Construction machinery, Industrial vehicles, Agricultural machinery industries	<ul style="list-style-type: none"><li>▪ Reduced the equivalent of 2.7 billion yen in personnel costs, through savings of labor at delivery-receipts</li></ul>
Book-related industry	<ul style="list-style-type: none"><li>▪ Reduced inspection times by about 90%.</li></ul>
Home appliances industry, Electronics and electric instruments industry	
Pharmaceuticals industry	
Department store industry, Apparel industry	<ul style="list-style-type: none"><li>▪ Annual cost reduction effect worth 10 billion yen as a result of shortened stocktaking times and shortened inspection times at delivery receipt and dispatch.</li><li>▪ Sales increase of 10% as a result of a reduction in lost sales opportunities backed by the swift provision of inventory information.</li><li>▪ From April 2005, some department stores to take up full-scale implementation of RFID tag systems.</li></ul>
Logistics industry	<ul style="list-style-type: none"><li>▪ Annual cost reduction effect worth 20.5 billion yen in personnel costs, due to savings of labor at goods inspection.</li></ul>
Record industry, DVD & CD industry	<ul style="list-style-type: none"><li>▪ Reduced stocktaking times by three quarters.</li></ul>



## Assessment from Earlier Trials

- ◆ Based on the knowledge, information and results gained in the field trials, certain industries are planning full-scale implementation of RFID tags, and considerable outcomes have been achieved.

For example: In the department store industry, Mitsukoshi and Hankyu adopted full-scale RFID tagging systems in April 2005.

- ◆ Since RFID tagging systems have a diverse range of effects, and since they act as an IT tool for raising the competitiveness of a company in a range of ways, even more field trials must be conducted from various perspectives, and plans must be laid for expanding the use of RFID tags.

### Effects of the RFID tagging system

- IT investments in "integrated manufacturing and sales systems"
- Investments in the "integration of commercial distribution and physical distribution"
- Integration of the flow of physical items and the flow of contract and management information ("integration of critical systems")
- Scalability of security and environmental measures, such as traceability systems
- Assurance of profitability for vendors through the integration of the business chain



## Direction of FY 2005

In order that the various effects of RFID tagging systems be maximized, and in order that they be linked to sustaining and strengthening industrial competitiveness with instant results, several broad-ranging themes have been set, and proposals are to be widely invited from industries and companies.



# Themes for the FY 2005 RFID Tag Field Trials

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**Industrial restructuring & government reform promotion projects**

**New industry creation projects**

**Inter-industry cooperation projects**

**International cooperation projects**

# Promoting the Field Trial Projects in the industries in FY2005

**In FY2005, METI decided to fund the 8 projects on RFID System.**

Category	Industry	Points
Industrial restructuring	1. Home Electrical Appliances and Electronic Products	Using RFID on electronic parts in terms of recycling.
	2. Pharmaceutical Products	This year, it includes distribution to pharmacy of medical agency in addition to last year experiment( from manufacture to drug store).
	3. Supply Chain of Japan Self Defense Forces	RFID will be used for efficient logistics in Self Defense Forces. It is aimed to collaborate with DOD system in the future.
Development of new industry	4. Self-control Robots	Self-control robots using RFID for spatial awareness and recognition human and things
Inter-industry coalition	5. Books, CD/DVD	The targets are item level tagging (direct attachment) , CRM in the book store, and theft detection in supply chain
	6. Retail (supermarket, department store, convenience store)	The target is CRM in each retail store, using smart shopping-cart, kiosk, cell-phone etc. (Japanese Future Store)
International cooperation	7. Automotive Parts	This project will use RFID for parts and RTI for efficient supply-chain of the automotive parts industry in ASEAN
	8. Office Equipment	Between Japan, China and South Korea, in the office equipment industry, for the purpose of efficient distribution, RFID will be attached to parts and pallet.



# Simultaneous utilization of RFID tag of various frequency bands

