

The Auto-ID Center Software Technologies

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April 2003

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Auto-ID Center

Auto-ID Technology
Infrastructure

Auto-ID Software
Architecture

Auto-ID Challenges

Big Picture: Sensor Age

Things to Think About

Summary

Auto-ID Center

Auto-ID Center .. Item Visibility



Auto-ID Center	Founded in 1999 by MIT, UCC, P&G and Gillette Today, 80+ sponsors (end users and vendors)
Vision	Connect the physical world to the digital world
Standards	For computers to instantly identify any physical object anywhere in the world
Town Trials	Phase III - Unilever, Gillette, P&G, Kraft, Coca-Cola, Wal-Mart and, Johnson & Johnson

Organization	Units in supply chain (billions)
Johnson and Johnson (CGM)	3
Kimberley Clark	10
Westvaco	10
The Gillette Company	11
Procter and Gamble	20
Unilever	20
International Paper	53
Total	127

Other high-value, high-consumption products:

- Electronics
- Automotive
- Pharmaceuticals
- Books
- DVD's
- Toys
- and so on ...

... to get the right products to customers at the right time and right place cost efficiently

Auto-ID Technology Chain

Electronic Product Code

The **electronic product code** (ePC) is a unique 68-, 96-, or 256-bit identifier

... sufficient for every manufactured item

... becoming a UCC standard in Sep '03

21.203D2A9.16E8B8.719BAE03C

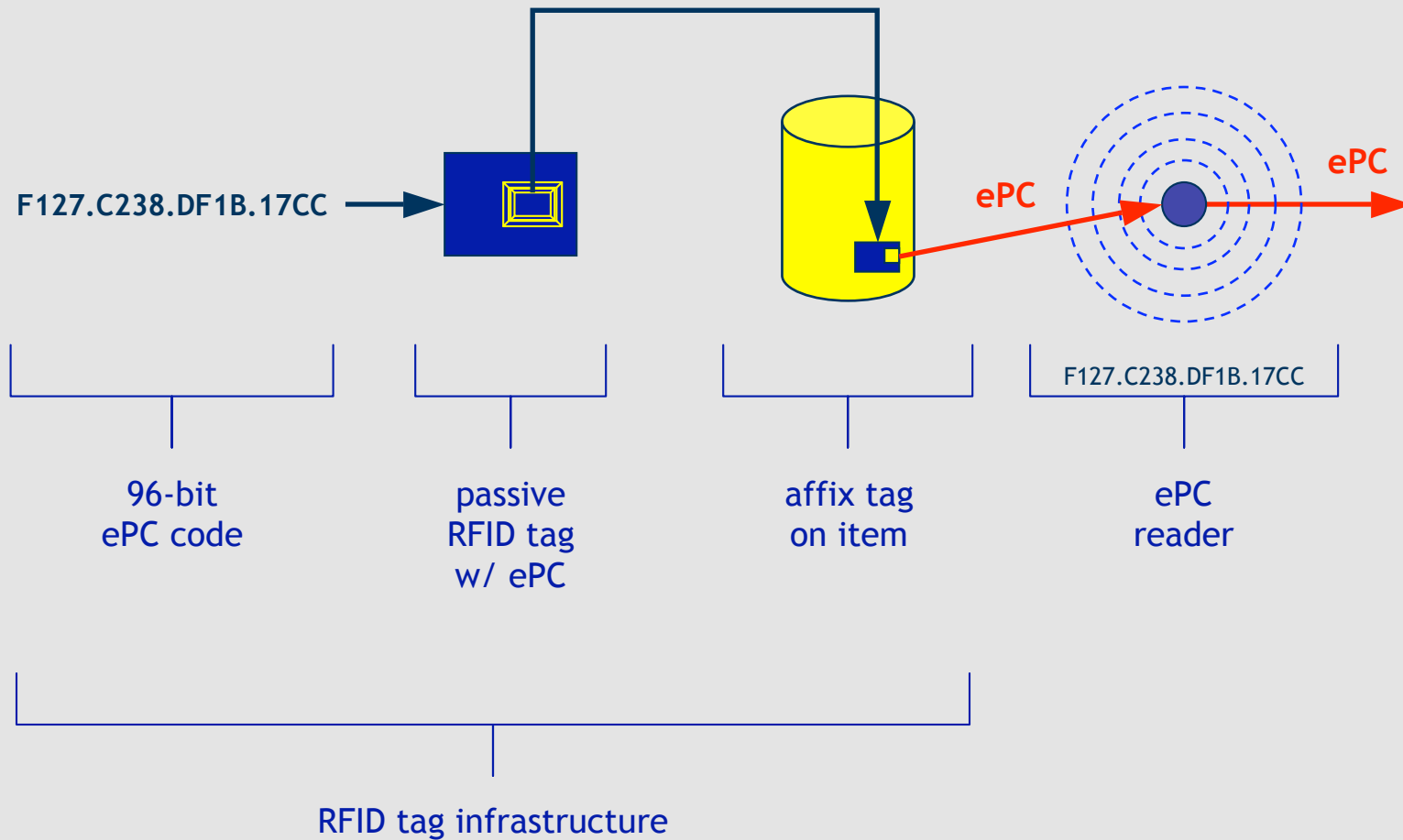
Header
8 bits
=256

Manufacturer
28 bits
>268m

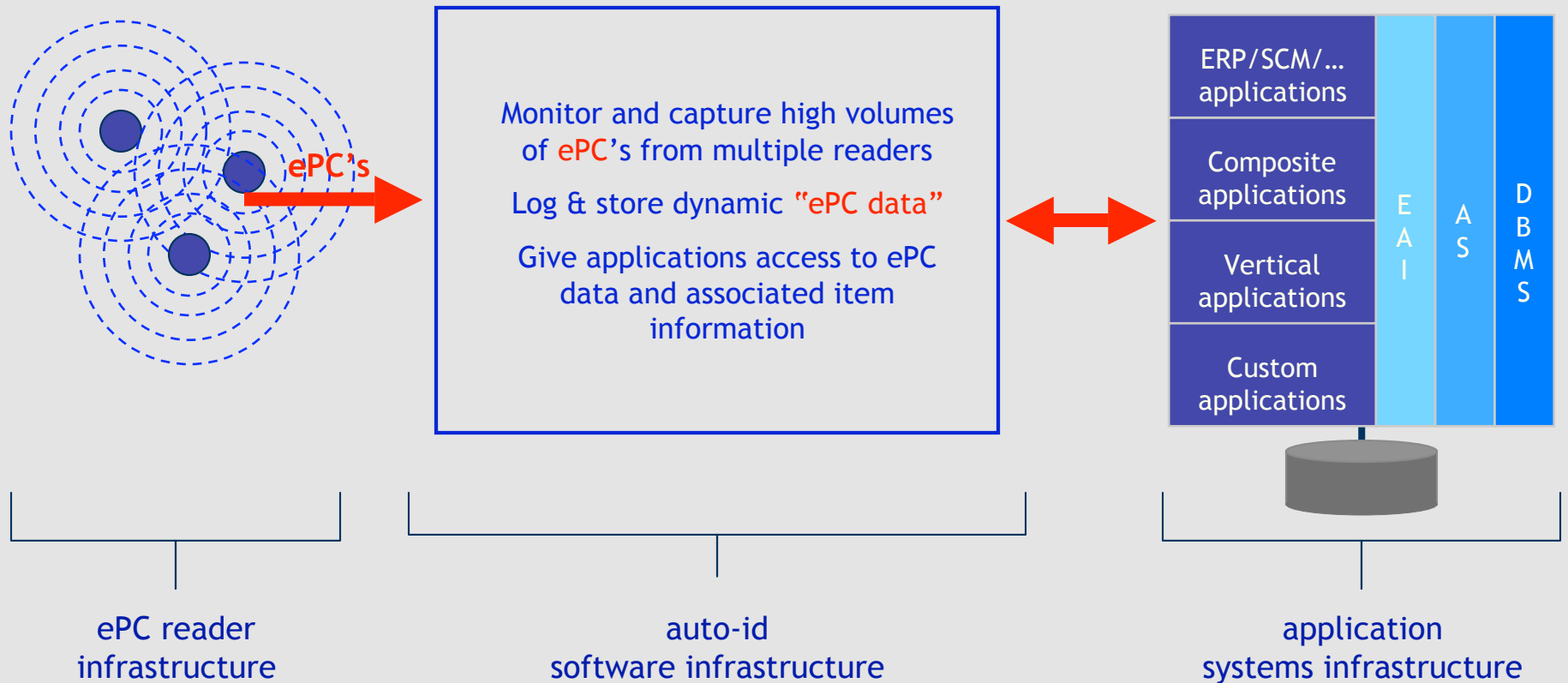
Product
24 bits
>16m

Serial Number
36 bits
>68bn

Auto-ID Technology Chain



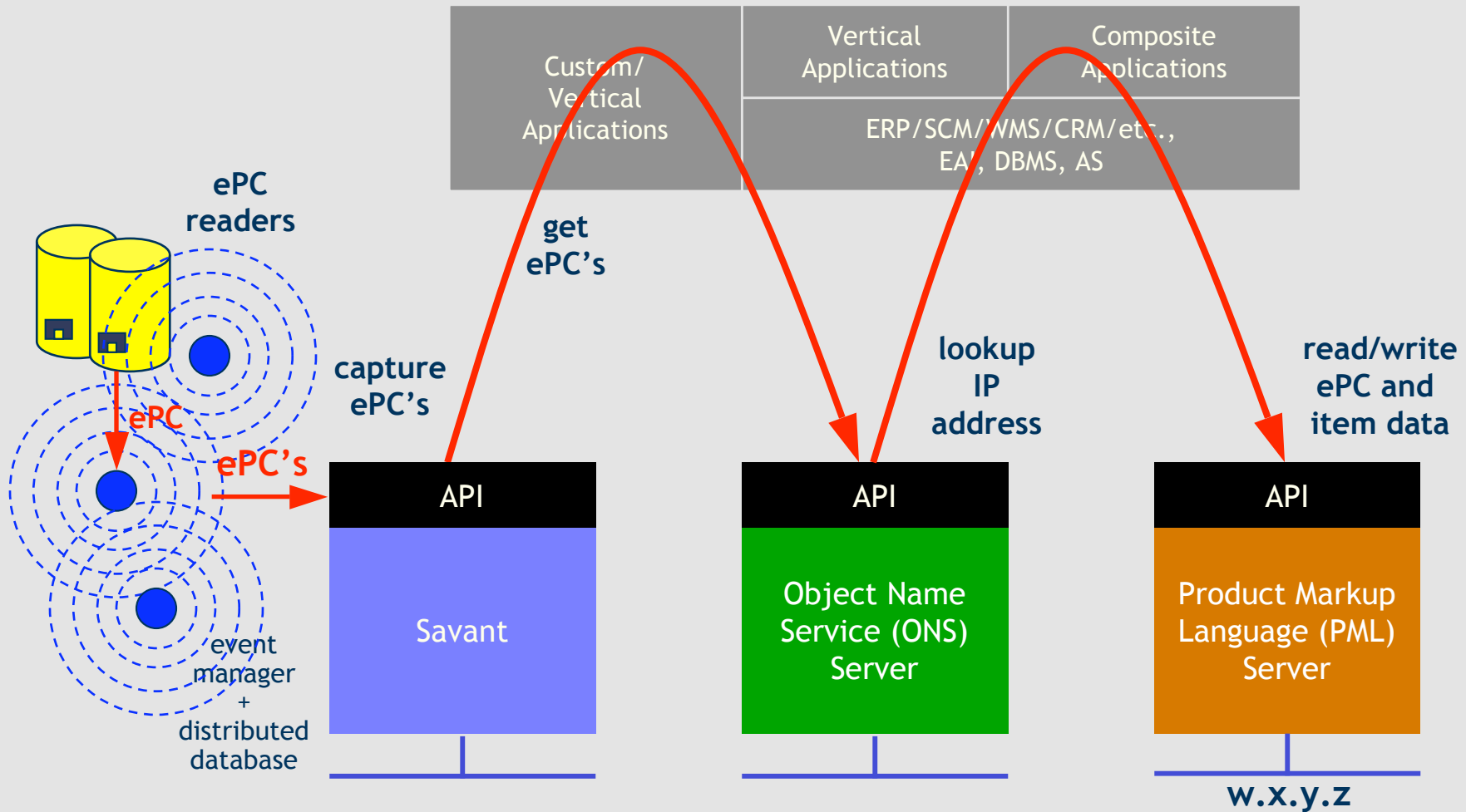
Auto-ID Technology Chain



Auto-ID Software Architecture

Auto-ID Software Architecture

Standards
 ePC
 Savant API
 ONS
 PML



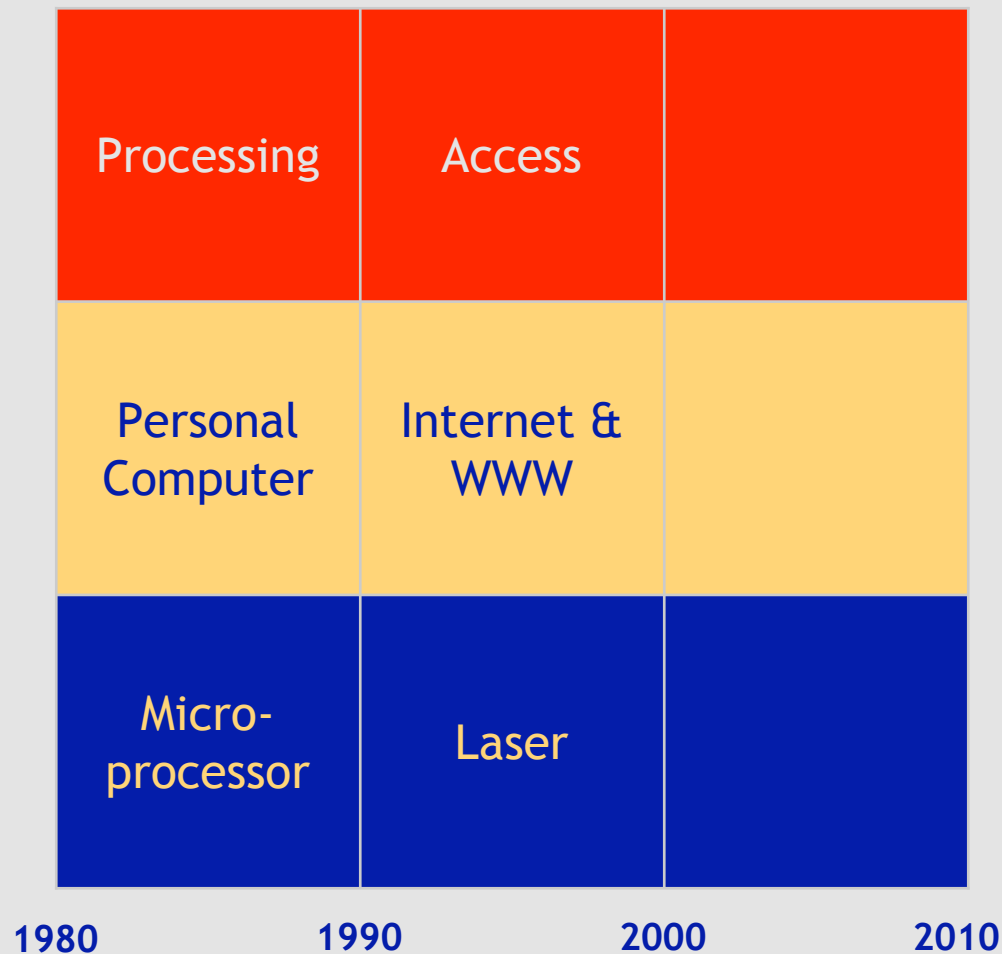
Challenges

Some Auto-ID Challenges

RFID Infrastructure	Towards the 5c and then the 1c passive RFID tag
ePC Read Infrastructure	Low-cost and reliable ePC-standard based readers Read accuracy Interference Health risks of this much RF
Auto-ID Software Infrastructure	Scalability Massive volumes of ePC data to be managed High throughput of ePC data in certain situations Distributed data management Speed of information access (performance) Security Privacy

Big Picture: The Sensor Age

What Next?



About every 10 years a new technology reshapes the information landscape

Microprocessors led the processing revolution of the 80's - symbolized by the PC

Lasers led the access revolution of the 90's - symbolized by the Internet and WWW - delivering fiber-optic bandwidth

Each successive technology builds on older technology to grow overall market

Favorable shift in price and performance triggers explosion

Source: Paul Saffo, Institute of the Future, 1997

The Sensor Age

Processing	Access	Interaction	
Personal Computer	Internet & WWW	Smartifacts	
Micro-processor	Laser	Sensors	
1980	1990	2000	2010

“Sensors will lead the interaction revolution of the 00’s
[symbolized by the Smart Web]
connecting the analog physical world
and the digital world”

Source: Paul Saffo, Institute of the Future, 1997

Smart Web

XML
XML-Schema
RDF
OWL

Interacting network of
the analog physical
world and the digital
world

Extension of current Web to enable
databases, services, programs, sensors
and personal devices to both consume
and produce data on the Web ie. the
automated web

“Smart Web” = Sensors + Semantic Web

RFID, MEMS, GPS, etc.
for interfacing with
the analog physical
world

... this will happen before 2010

Some Things To Think About

Connecting the physical world with the digital world	<p>Will sensors lead the 'interaction' revolution of the 00's?</p> <p>Are we ready for the (physical worlds) data tsunami to be unleashed in the coming ten years?</p> <p>Is there going to be an explosion in processor, bandwidth and storage requirements?</p>
Security and privacy	<p>Yes, what about security and privacy?</p>
Auto-ID/RFID	<p>Is Auto-ID/RFID the catalyst towards the Smart Web?</p> <p>Do we really want every can of beans connected to the net?</p> <p>What about connecting to the net information about each bottle of pills, pack of beef or Firestone tires?</p> <p>Will all this radio frequency turn us into human radios? Radio Gaga?</p>
Wild card	<p>Or, is someone working on something else out there?</p> <p>The Lotus 1-2-3 or Mosaic of the Sensor Age?</p>

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