



INTEGRATE



BUILD



PORTAL

Laying a Foundation to Accelerate the ROI from RFID

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Agenda

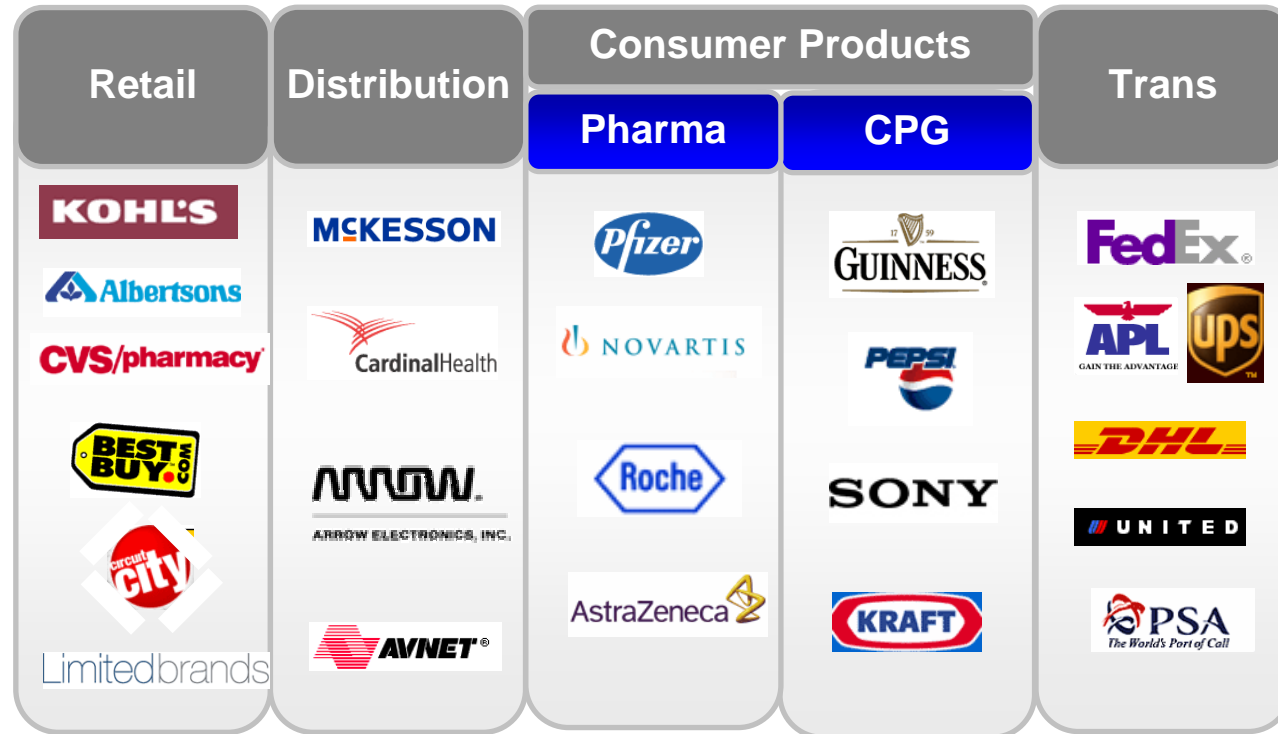
- Introduction to BEA
- The RFID Scalability Iceberg
- Accelerating the ROI with BEA RFID Solutions

BEA Systems, Inc. Corporate Overview

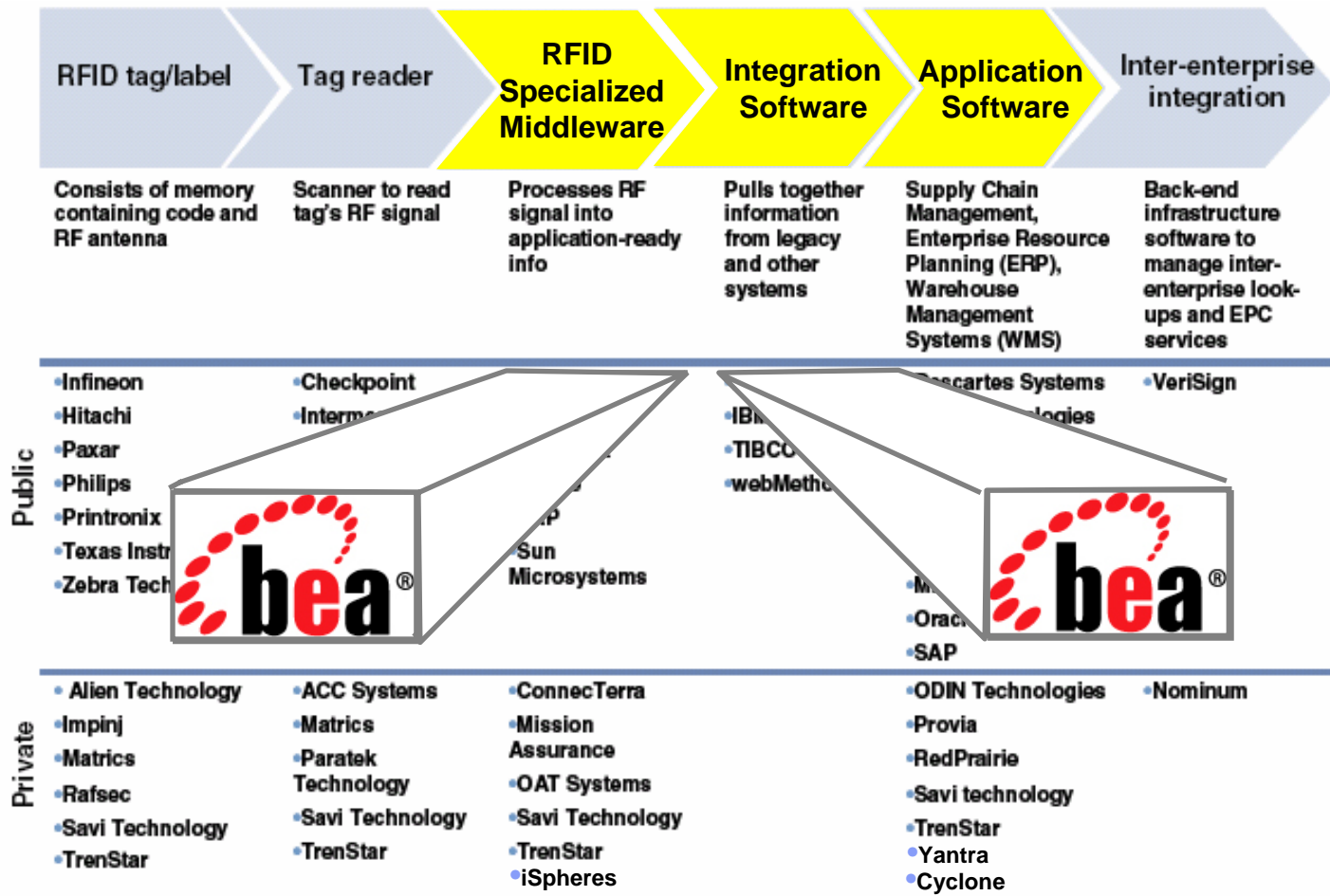
- BEA Overview -

- 6th largest independent software company
- 15,000 customers
- 4,000 employees
- Financials:
 - \$1.1Bn Run Rate
 - \$1.6Bn in Cash
 - \$500M R&D in last 3 years
- **WebLogic Platform™** helps companies create and sustain competitive advantage by quickly and efficiently automating new processes with enterprise class applications

- Select Distribution Intensive Customers -



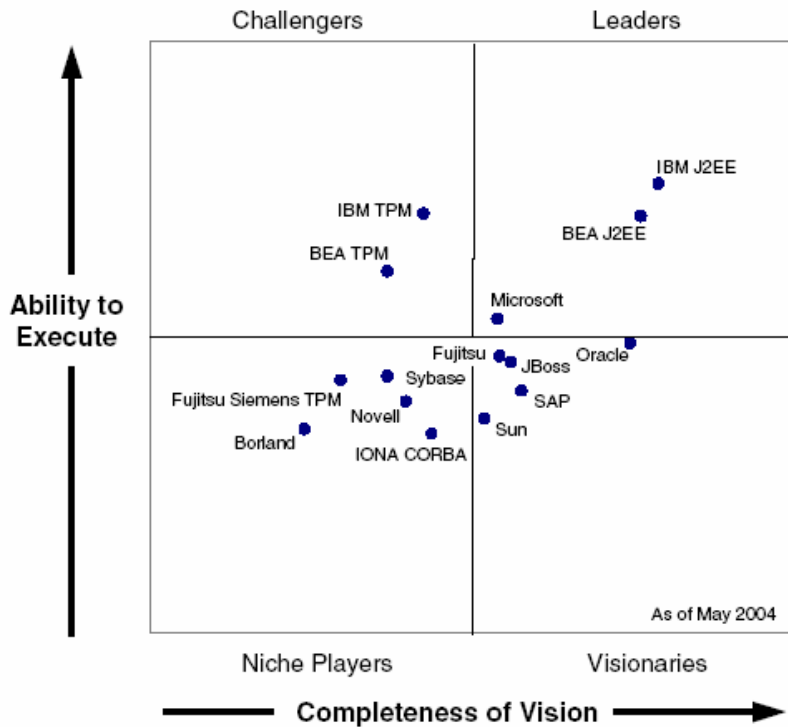
Financial and Industry Analysts Recognizes the Relevance of our Platform



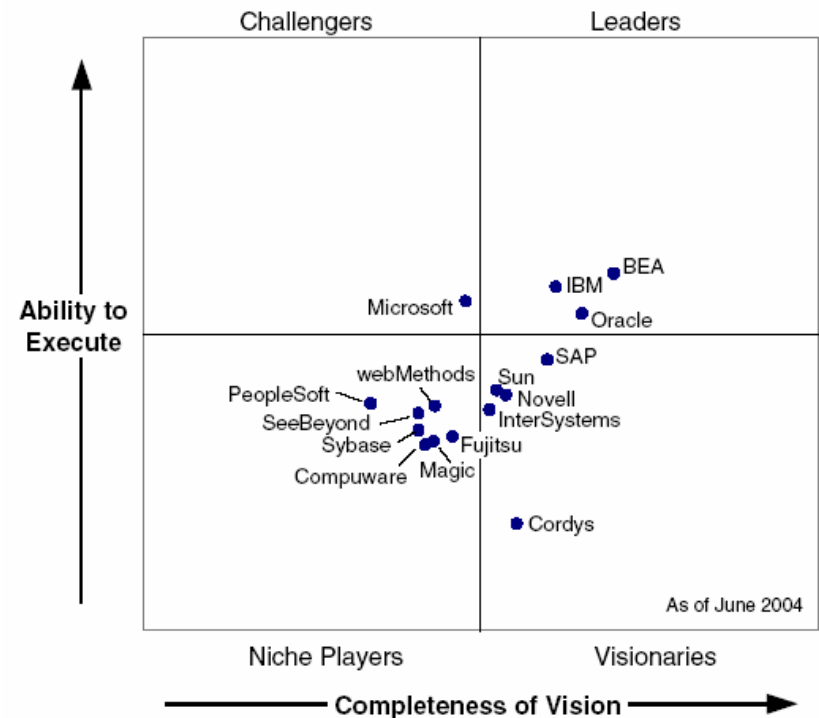
Source: Goldman Sachs, Feb 6th 2004

BEA leads the market in both scalability and Application Platform Suites.

- Gartner Magic Quadrant for Enterprise Application Servers -



- Gartner Magic Quadrant for Application Platform Suites -



Source: Gartner Research (June 2004)

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Early Adopter Retailers will Face Two Big Questions in Dealing with this Volume

1

How can they ensure their infrastructure can scan to handle this level of event volume?

2

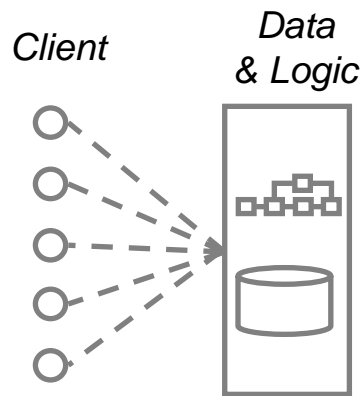
Given the hardware investment required to handle events, how can they accelerate the ROI?



To deal with web traffic, companies adopted a 3-tier architecture. RFID adds the need for a 4th tier.

1990

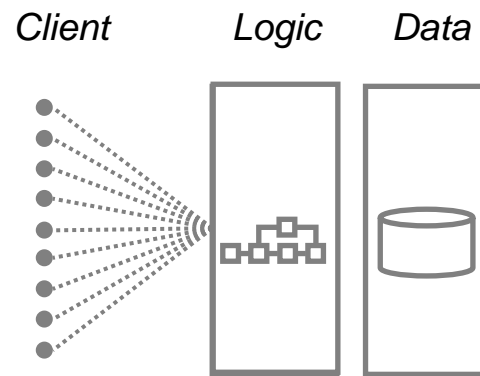
Client Server



10,000s of clients

2000

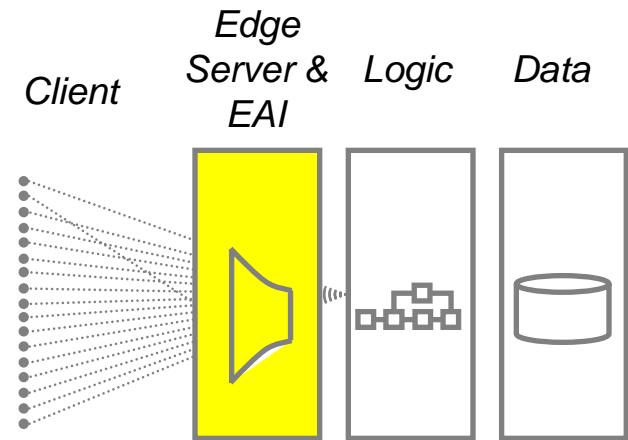
Internet



100,000s of clients

2010

RFID & Sensor

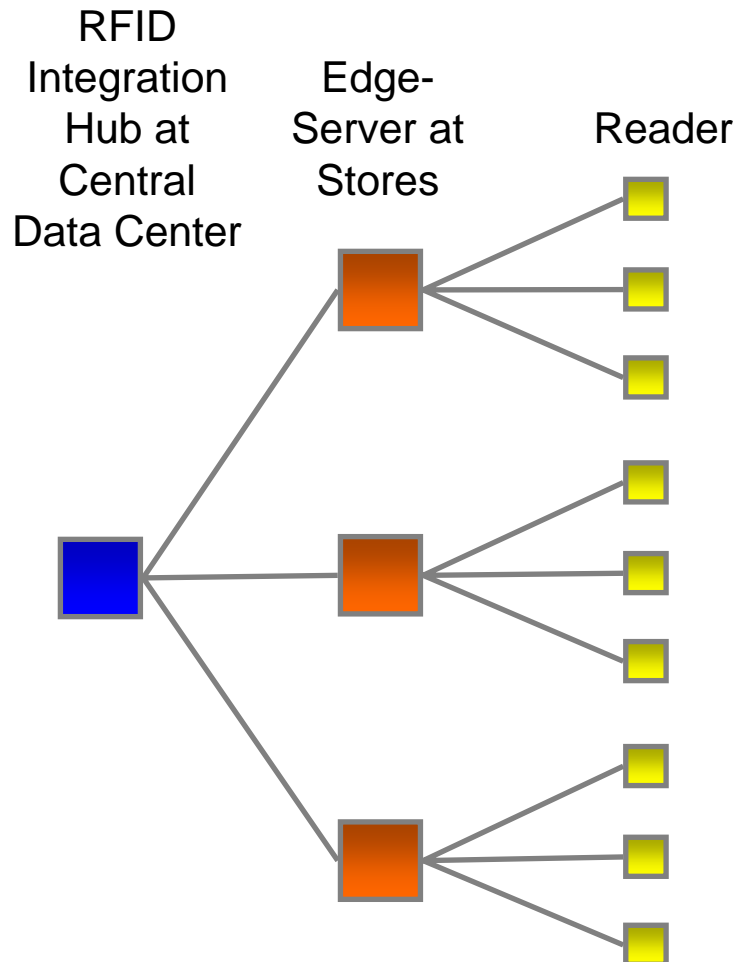


100,000,000s of clients



RFID Event Performance Considerations in Retail

- Typical RFID Event Network -



- Estimation of Events per Store -

	Case / Pallet	Item
▪ Readers	15	150
▪ Edge-server "Polling"	2 / sec	2 / sec
Total "Reads" at Edge-server	30	300

▪ Example Number of Stores	1,800	1,800
▪ App Level Events (ALE) per Reader	10/hour	100/hour
▪ ALE Events at Hub / sec	75 / sec	7,500 / sec

RFID will generate a tremendous number of events in the retail enterprise.

- Projected RFID Events for Top 10 Global Retailers -

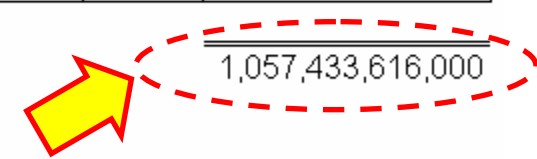
Num	Retailer	Country	Number of Stores	Case & Pallet Level				Item-Level			
				Readers Per Store	Edge-Server "Polls" per Sec	Events per Sec	Events per Year	Readers Per Store	Edge-Server "Polls" per Sec	"Events" per Sec	"Events" per Year
1	Wal-mart	US	5,164	25	50	359	5,654,580,000	200	400	12,910	203,564,880,000
2	Carrefour	France	10,704	10	20	297	4,688,352,000	80	160	10,704	168,780,672,000
3	Ahold	Neth	9,407	15	30	392	6,180,399,000	120	240	14,111	222,494,364,000
4	Kroger	US	3,667	15	30	153	2,409,219,000	120	240	5,501	86,731,884,000
5	Metro	Germ	2,411	15	30	100	1,584,027,000	120	240	3,617	57,024,972,000
6	Tesco	UK	2,294	15	30	96	1,507,158,000	120	240	3,441	54,257,688,000
7	Costco	US	400	40	80	44	700,800,000	320	640	1,600	25,228,800,000
8	Albertson's	US	1,688	15	30	70	1,109,016,000	120	240	2,532	39,924,576,000
9	Rewe	Germ	12,077	5	10	168	2,644,863,000	40	80	6,039	95,215,068,000
10	Aldi	Germ	6,609	10	20	184	2,894,742,000	80	160	6,609	104,210,712,000

29,373,156,000

1,057,433,616,000

Assumptions-

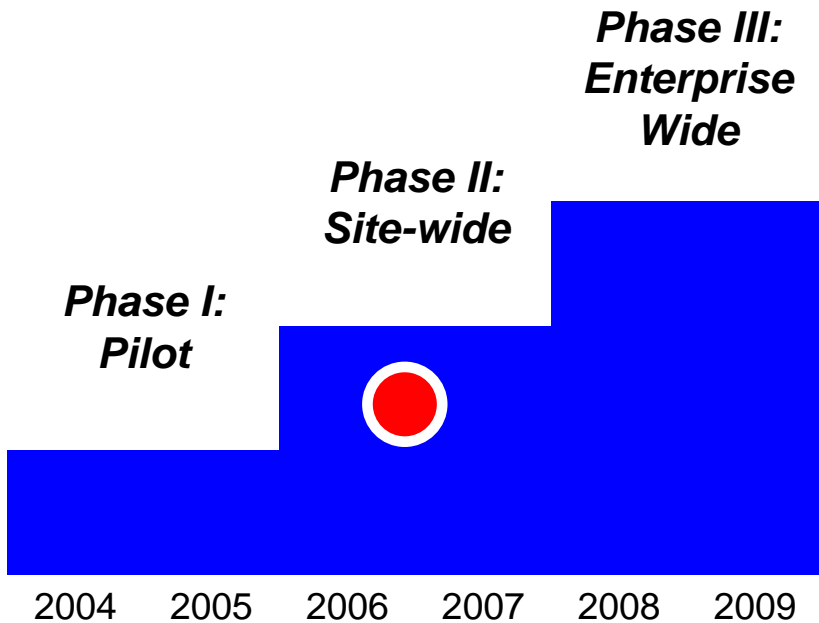
- 1 Edge-server "Polling Rate" 2 per sec
- 2 Application Level Events (ALE) per Reader - Case Level 10 per hour
- 3 Application Level Events (ALE) per Reader - Item Level 45 per hour
- 4 Multiple of Readers at Store from Case to Item-level 8 times as many readers



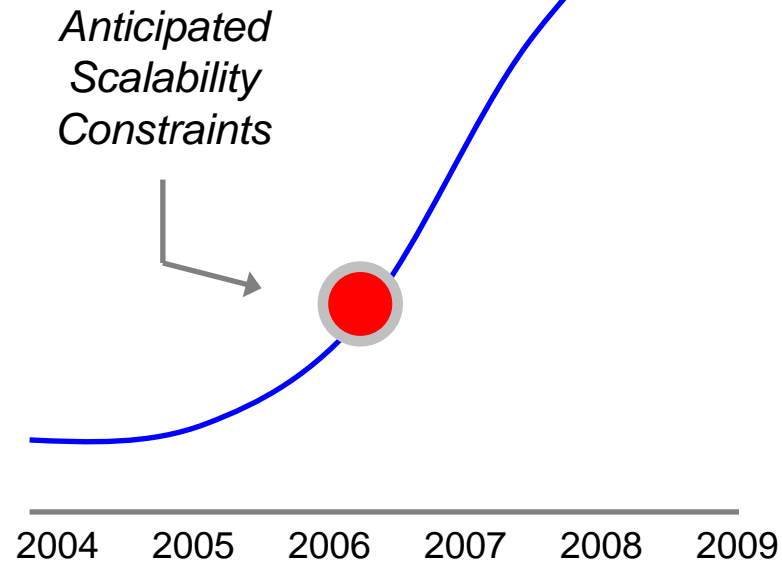
Top 10 Global Retailers Could See 1 Trillion Events at Item-Level

As companies move from pilots to production, they will need a scalable, secure and highly-available edge-server and integration capability.

- Common RFID Deployment Timelines -



- Number of RFID Events in the Enterprise -



For early adopters, the **RFID Scalability "Train Wreck"** is 18-24 Months Away

The edge-server and integration capability needs to address 7 pitfalls.

- RFID “Iceberg”



Visible Obstacles-

1. RFID Physics
2. RFID Tag Costs

Hidden Obstacles-

How to set-up an infrastructure to realize value from the RFID data and to avoid the following “**7 technology pitfalls**”:

- ① Scalability
- ② Availability
- ③ Security
- ④ Interoperability
- ⑤ Integration
- ⑥ Administration
- ⑦ Messaging

The 7 anticipated technology pitfalls of the 4th tier.

	Challenge	Description	What is Required / Solution
1	Scalability	<ul style="list-style-type: none"> ▪ 100's of readers reading 100's of time a second ▪ CPU utilization ▪ Network bandwidth ▪ Data repository constraints 	<ul style="list-style-type: none"> ▪ Thread Multiplexing ▪ "Non-blocking" IO ▪ Eliminate duplicates through ALE ▪ "Boxcarring" packets ▪ Handle data storage at EAI layer
2	Availability	<ul style="list-style-type: none"> ▪ Reduce dependency on database at the edge ▪ Ensure availability of integration / server layer 	<ul style="list-style-type: none"> ▪ File system / not DB at edge ▪ Handle DB at integration layer ▪ Use of load balancers ▪ High-availability messaging through clustered JMS ▪ Clustered database to "back" the integration / server layer

The 7 anticipated technology pitfalls of the 4th tier (cont.)

	Challenge	Description	What is Required / Solution
3	Security	<ul style="list-style-type: none"> Administration must be secure to prevent readers from being turned off and items being stolen 	<ul style="list-style-type: none"> Administrative interface must be protected by authentication, authorization, audit, and potentially over SSL (Secure Socket Layer) <ul style="list-style-type: none"> however, SSL “handshake” is very CPU intensive Without SSL, the entire stack (reader/edge/server) should be wrapped in a firewall to enable perimeter auth Choose middleware that is easily pluggable to 3rd party security providers
4	Interoperability	<ul style="list-style-type: none"> Interoperability with packaged applications Interoperability with readers 	<ul style="list-style-type: none"> Support for standards-based JCA Adapters Well built reader abstraction layer at the edge that readily facilitates device drivers additions and updates Support for all specific commands, not just the common denominator

The 7 anticipated technology pitfalls of the 4th tier (cont.)

	Challenge	Description	What is Required / Solution
5	True Integration Layer	<ul style="list-style-type: none"> ▪ Global view difficult to support due to different readers and “edge-server” formats ▪ Complex event composition is costly and not suitable at CPU intensive edge (transformation and duplicate elimination) ▪ Edge-server not designed to integrate with other components of an integrated sw platform 	<ul style="list-style-type: none"> ▪ Use a unifying EAI layer to compose and correlate events from different sets of RFID infrastructure ▪ Use clustered integration servers to absorb load of complex event composition ▪ Use a EAI product that is fully integrated with BPM and Portal so you can rapidly take advantage o
6	Administration	<ul style="list-style-type: none"> ▪ Different administration consoles from different components prevent a centralized admin 	<ul style="list-style-type: none"> ▪ Need to ensure RFID components integrate with existing management vendors (HP Openview, Tivoli) and support protocols like SNMP & JMX
7	Messaging	<ul style="list-style-type: none"> ▪ Once RFID becomes mission critical need to ensure messages are sent once and only once 	<ul style="list-style-type: none"> ▪ Support “exactly once” semantics ▪ Need txn guarantees on message enqueue & dequeue ▪ Need asynchronous JMS support

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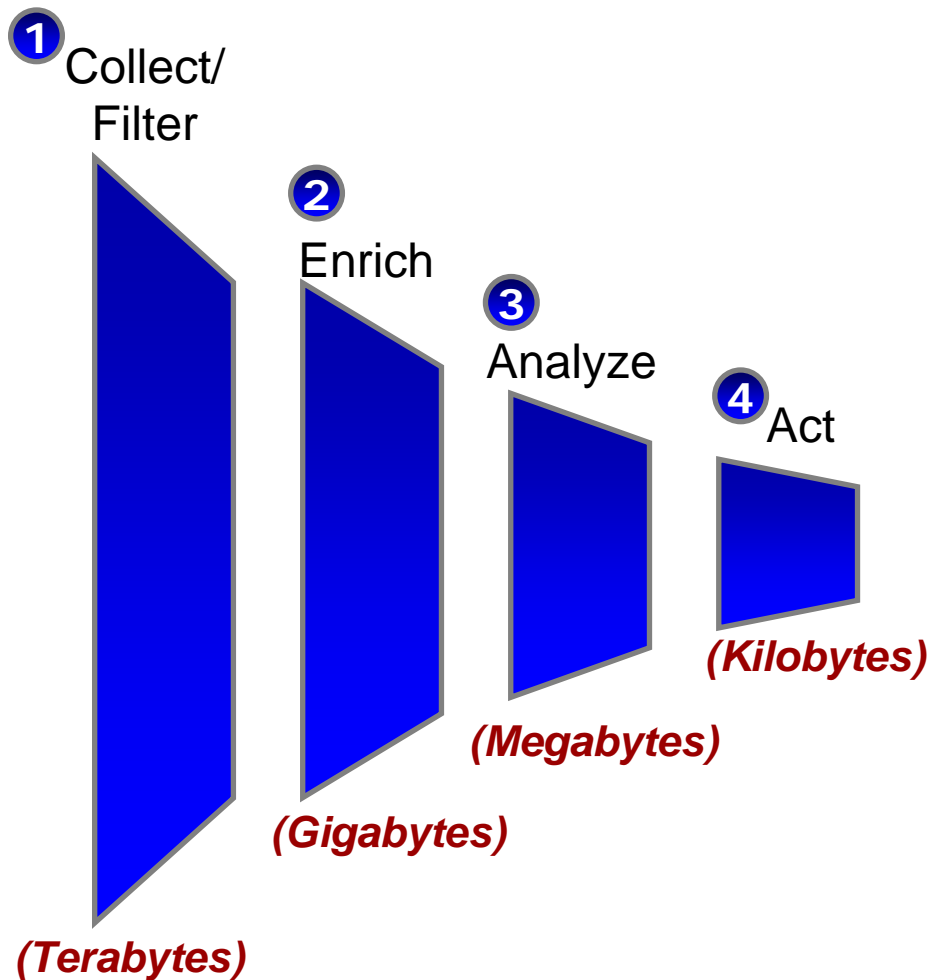
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Given the hardware investment required to handle events, how can they accelerate the ROI?

The RFID Integration Layer Creates Business Relevant Events from RFID "Scans"

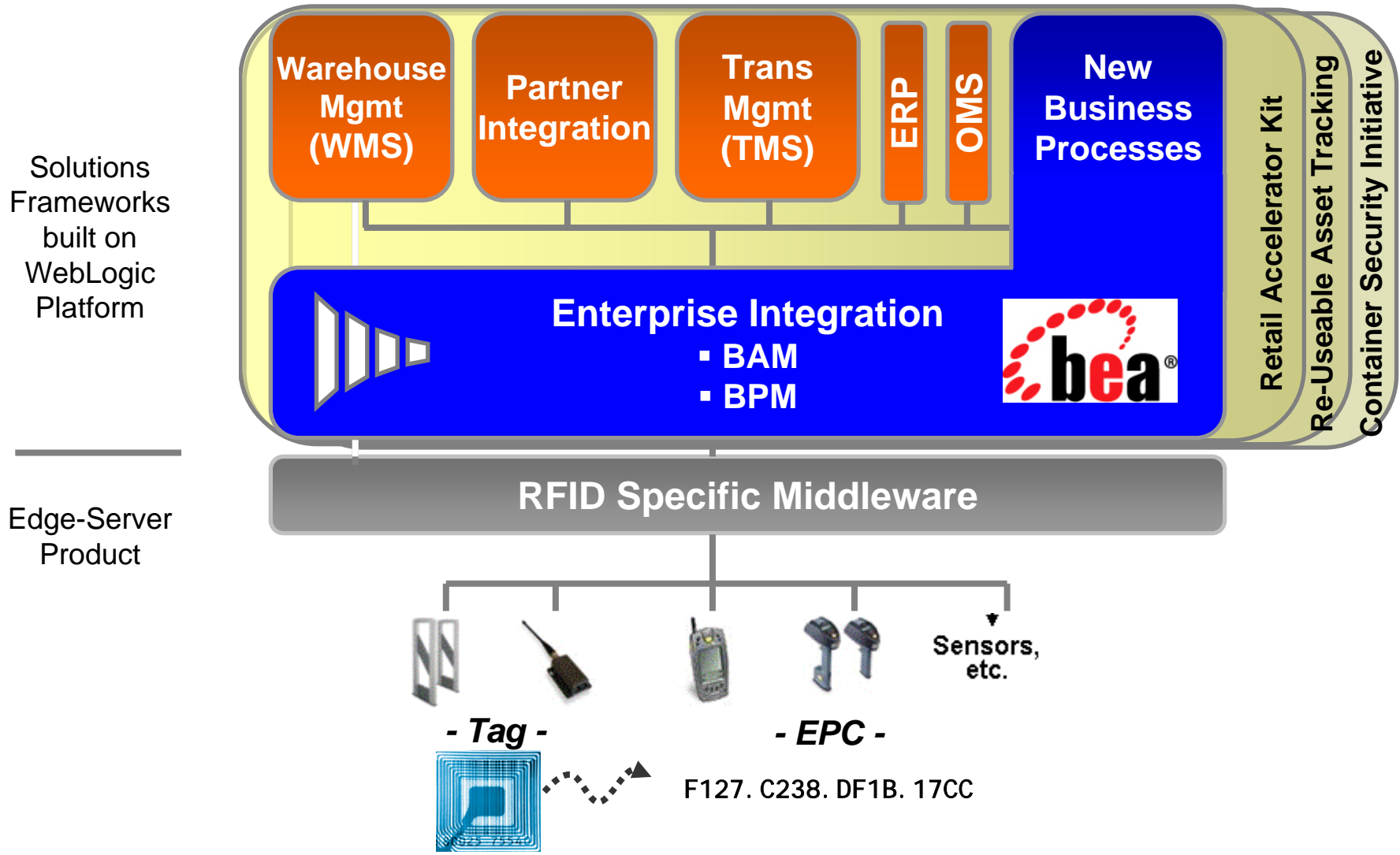
- Moving from RFID Scans to Business Relevant events -



- RFID Integration Layer Partners -

Stage	Vendors
Collect/Filter	Edge-Server Partners
Enrich	 Liquid Data Platform
Analyze	 BPM
Act	 BPM Platform

BEA RFID Solution Stack



The RFID ROI for Trans Providers ...

requires platform

- New **Trans** Processes -

Enhanced Process	Description	Value	Integrated Platform			Partners
			Integration	Portal	Build	
Asset Tracking	<ul style="list-style-type: none"> Track containers (tray, rack, intermodal containers) Enhance visibility of container contents Optimize re-useable asset utilization 	<ul style="list-style-type: none"> Cost 	✓	✓	✓	✓
Asset Maintenance	<ul style="list-style-type: none"> Attach Sensors & RFID tags on asset components For out of tolerance trends, send alert Store operational history for more efficient maintenance 	<ul style="list-style-type: none"> Cost 	✓	✓	✓	✓
Inventory at Custody Changes	<ul style="list-style-type: none"> Provide accurate inventory archive at custody changes Rev generating service offering for high-value goods 	<ul style="list-style-type: none"> Rev Cost 	✓	✓	✓	✓
Security (Positive Identification)	<ul style="list-style-type: none"> Use RFID to identify package contents Useful for hazardous goods and international shipments 	<ul style="list-style-type: none"> Rev Cost 	✓	✓	✓	✓

The RFID ROI for Retailers ... requires platform

- New Retail Processes -

Enhanced Process	Description	Value	Integrated Platform			Partners
			Integration	Portal	Build	
Predictive Out-of-Stocks (OOS) Alerts	<ul style="list-style-type: none"> Facilitate accurate "back room" inventory record Measure against POS data to predict OOS Alert store employees and notify of stock location 	<ul style="list-style-type: none"> Rev 	✓	✓	✓	✓
Theft and Obsolescence Alerting	<ul style="list-style-type: none"> <i>Basic</i>: alert based on expiry date <i>Advanced</i>: use temp and humidity sensors Theft alerting geared towards DC, Backroom & Floor 	<ul style="list-style-type: none"> Cost 	✓	✓	✓	✓
Store of the Future	<ul style="list-style-type: none"> Shopping list download on store handheld Self-service directions to desired products Dynamic promotions management 	<ul style="list-style-type: none"> Rev Cost 	✓	✓	✓	✓

The RFID ROI for CPG manufacturers ... requires platform

- New CPG Processes -

Enhanced Process	Description	Value	Integrated Platform			Partners
			Integration	Portal	Build	
DSD: Dynamic Mixed Pallet ASNs	<ul style="list-style-type: none"> Create "dynamic" mixed pallets tailored to stores Build operator system to capitalize on these efficiencies Offer this lower "lot size" as a premium svc 	<ul style="list-style-type: none"> Rev 	✓	✓	✓	✓
Claim Dispute Automation	<ul style="list-style-type: none"> With predictive alerting ensure right product, time, place Capture / archive shipments to facilitate claim response Build system to leverage this data in support of disputes 	<ul style="list-style-type: none"> Cost 	✓	✓	✓	✓
"Cold Chain" Management	<ul style="list-style-type: none"> Use predictive event correlation to monitor temp & react Use hierarchy (yellow = 5mn>28deg, red = 2mn>32deg) Store temp profile and archive for spoilage disputes Use to enable "fresh" cross-docking, etc. 	<ul style="list-style-type: none"> Rev Cost 	✓	✓	✓	✓

The RFID ROI for Pharma suppliers ...

requires platform

- New **Pharma** Processes -

Enhanced Process	Description	Value	Integrated Platform			Partners
			Integration	Portal	Build	
Anti-Counterfeit Pedigree Tracking	<ul style="list-style-type: none"> Pharma suppliers build pedigree application Distributors & retailers access to ensure identity 	<ul style="list-style-type: none"> Rev Cost 	✓	✓	✓	✓
Med / Surge Instrument Tracking	<ul style="list-style-type: none"> Embed "hardened" RFID tags in surgical instruments Develop tracking app to optimize instrument utilization Provide alert to ensure all instruments accounted for 	<ul style="list-style-type: none"> Cost Svc 	✓	✓	✓	✓
Same Distribution Efficiencies as CPG						



 INTEGRATE	 BUILD	 PORTAL
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Thank You!

